Acne Vulgaris in University Students: Prevalence, Knowledge and Lifestyle Association

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ABSTRACT

Objectives: This study focuses on determining the prevalence of acne vulgaris among undergraduate medical students of a public sector institute of Pakistan. Besides, we aim to evaluate the level of knowledge and different lifestyle factors about acne and correlate them to gender and academic years of study.

Methodology: For this purpose, a cross-sectional study design was selected, and the data was collected using a stratified random sampling technique. A paper-based self-made English questionnaire was distributed among the participants. A Chi-square test was used to compare differences of different categorical variables across gender and academic years.

Results: One hundred and seventy medical students from a public institute of Rawalpindi, Pakistan were recruited for the study. More than half of the students (64.7%) had acne vulgaris out of which 68% were females. Majority of the participants (61.8%) were between 18 and 21 years old, and most were single (99.4%). The most common site affected was the face (82.7%). Only 47.3% of the students with Acne had consulted the physician. Academic years were significantly related to the level of knowledge. Most of the students of clinical study years believed hormonal change, stress, and diet to cause Acne. Among treatment options, topical agents showed the highest number of responses (52.8%). Gender was significantly related to a lifestyle where females had acne lesions appearing more at the time of stress.

Conclusion: The results of this study indicate a high prevalence of Acne among Pakistani medical students, especially females. Lack of knowledge about Acne is widespread among medical students. Efforts should be made to improve knowledge about Acne in medical students to alleviate the burden of this common skin disease from the community.

Keywords: Acne vulgaris, medical students, hormones, lifestyle, stress, Pakistan

INTRODUCTION

Acne vulgaris represents the most prevalent skin disease of the world affecting about 9.4% of the world’s population during a specific period of their life, of which 80% present with Acne during 11 to 30 years of age suggesting a hormonal influence.1 It is an epidemic inflammatory disease related to the human pilosebaceous glands with follicular hyper-keratinization and colonization by Propionibacterium acnes.1 Clinically, Acne is characterized by the presence of open and closed comedones, papules, pustules, nodules, cysts, and occasionally scars.2 Despite a high prevalence rate across the world, insufficient knowledge exists among medical students, especially before the commencement of their clinical learning years regarding effective control and the possible treatment options of acne vulgaris. Many attribute stress and hormonal changes as the only causes.3 Hereditary factors alone do not explain the high prevalence rates of Acne in many parts of the world.4 Several risk factors for Acne have been proposed, including genetic, hormonal, and lifestyle factors such as diet and smoking. There is evidence of an association between a Western diet, in particular high glycemic index foods, and Acne that contribute to the clinical features of Acne in terms of appearance and severity of the various lesions associated with it.4,5 A study done in the Kingdom of Saudia Arabia in 2017 showed that Acne vulgaris prevalence was about 55.5% among medical students with no significant gender predilection.3 Another study done in India in 2017, estimated an acne prevalence of 89% among medical students.

Nov 2020 - Jan 2021 | Vol 1 No 4 | e240 | 1
students.[6] However, a study conducted in Pakistan in 2019 found that 69.9% of its student population suffered from Acne.[7] An Indian study testing the knowledge about associat factors showed that 82% believed it to be related to diet, while 30% considered the condition to be hereditary. In contrast, a Norwegian study further explained the diet correlation by showing that high intakes of full-fat dairy products caused moderate to severe Acne.[6][8][9] According to a study by Al-Natour, 52% of students believed that Acne was transient and could be treated from the first or after a few visits to the doctor, which is a misconception.[10] Knowledge about lifestyle associations and ameliorating factors was variable in the same study.[10]

Moderate to severe Acne greatly affects the quality of life as it may cause severe discomfort, permanent facial scarring, emotional and physical distress, occupational consequences, and potential psychiatric disturbances.[7][11] However, there is a lack of knowledge about acne vulgaris in medical students in Pakistan, especially about the association of acne vulgaris with its causes. We aim to assess the knowledge and lifestyle practices and provide potential recommendations for medical students so that they can approach for appropriate treatment according to the guidelines. These recommendations will help the students to improve their level of knowledge and practices in dealing with acne vulgaris, which may help boost their self-confidence and relieve their stress associated with Acne.

MATERIALS AND METHODS
This was a cross-sectional study carried out among undergraduate first to final year medical students of a public institute of Rawalpindi, Pakistan from June 2019 to September 2019. A stratified random sampling technique was used to collect data from 170 students. The purpose of the study was explained properly to the students, their consent was taken, and confidentiality was maintained. The sample size was calculated using the calculator provided by Creative Research Systems-Survey Software.[12]

In Pakistan, the MBBS course is divided into five academic years, and education is divided into two phases. The pre-clinical years include the 1st and 2nd year while the clinical students include 3rd, 4th, and final-year. MBBS undergraduate students from all academic years of study were included, and those students who were not willing to participate as well as those who provided incomplete data were excluded from the study.

A paper-based self-made English questionnaire was distributed to the participants, which is shown in the Appendix. This questionnaire was divided into four sections: Demographic details (5 questions), Prevalence and Attitude details (5 questions), Knowledge (7 questions), and Lifestyle Association (9 questions). The participants who did not suffer from acne vulgaris at present as well as in the past five years were asked to fill Demographic details and Knowledge section only.

Data were analyzed using IBM Statistical Package for Social Sciences (SPSS), version 26 (IBM Corp., Armonk, NY, USA). Data were tabulated in the form of frequencies and percentages. Cronbach alpha value was calculated to check the reliability of the self-made questionnaire, which came out to be 0.7. Chi-square test was used to compare differences of different categorical variables across gender and academic year. It was observed that there was a statistically significant difference with p-value < 0.05 with a confidence level of 95%. The study was ethically approved from the institutional research forum by Rawalpindi Medical University.

RESULTS
A total of 170 medical students were recruited for the study according to the calculated sample size. Sociodemographic characteristics are shown in Table 1.

More than half of the students (n:110; 64.7%) had acne vulgaris out of which 75 (68%) were females. Common sites of acne lesions found are shown in Figure 1, with the face being the most common area affected by Acne (82.7%).

Less than half of them (n:52; 47.3%) had consulted the physician for their problem. Fifty-four students (49.1%) had taken medications for Acne, and the medications worked only for 42 (38.2%) students. Responses regarding the most prone skin type are shown in Table 2.

Academic years of study were significantly related to knowledge and are shown in Table 3. Students of pre-clinical years gave a more negative response for genes, personal hygiene, unsanitary living conditions and chocolates, coffee as the causes of Acne as compared to the clinical years. Most of the students of clinical study years believed hormonal change, stress, and diet to cause Acne.

Regarding treatment options, responses of the students are shown in Figure 2, according to which topical agents show the highest number of responses (52.8%) and laser has a significant p-value. More than half of the students (n:86; 50.6%) believed that acne vulgaris was curable. Most of the students
believed 14-17 years of age are most prone for the development of Acne whereas others (n:48; 28%) believed it to be 18-20 years and 65.3% of the students stated that Acne settles down in the late twenties. Only 10% believed that it never settles down. Gender was significantly related to lifestyle shown in Table 4, where females had acne lesions appearing more at the time of stress. However, females had less disturbed sleep as compared to males.

DISCUSSION
The results of the study indicated a high prevalence of Acne in our setting which is per a Malaysian study that reported a prevalence of 68.1% and a study among Portuguese medical students reporting the prevalence of 62.2%.[13][14] However, studies were done in Saudia Arabia (Middle East), France, Belgium, Italy, and Spain (Europe), Egypt (Africa), and China (Asia) which reported much lower prevalence rates.[5,15-17] The difference in the results could be attributed to the disease being multifactorial and being affected by lifestyle, gender, age, genetics, and other environmental factors.[18] Of the students affected, more than half (68%) were females, which is similar to the female predominance found in studies done on students in Portugal (68%) by G Gonçalves and in Egypt (60%) by Al-Hamd MA.[14,16] In contrast, only 14.4% of female medical students were affected by Acne according to another study in Pakistan.[11] The Malaysian study revealed gender association to be statistically insignificant, while a study in Nigeria showed a more male population suffering from Acne.
Nigeria showed a more male population suffering from Acne.\cite{13,19}

Concerning the help-seeking behaviours of the patients in our study group, only less than half (47.3\%) had consulted a physician. Similar results came out in a community study conducted by Smithard A.\cite{20} According to studies done in schools and hospital OPDs in the UK, reasons could include embarrassmement, Acne not being severe enough, feeling that doctor was unapproachable or busy. In contrast, a Pakistani study showed that 80\% of the students preferred medical advice from a dermatologist, which reflected an increase in medical students awareness in recent times about Acne is a treatable medical condition.\cite{21-22}

Academic years of study were positively associated with knowledge and causative factors. Shiva Swamy KN et al. also reported a similar relationship with an increase in mean scores of up to 16.5\% from pretest to posttest questionnaires possibly due to increased clinical exposure and learning during ward rotations as the academic year advances.\cite{6} The most common causative factors were believed to be hormonal changes (82.4\%) and stress (64.7\%) with a p<0.001 and p=0.004, respectively. Al Robaee AA also noted in his study that 56\% of students had adequate knowledge about Acne, and the majority of the students believed hormones and stress to be the commonly associated factors with Acne.\cite{23} However, only 44\% of students in another study were able to identify this link.\cite{6} Farid-ur-Rehman et al. noted in his study that diet had a significant relationship as a causative factor of acne vulgaris.\cite{24} Hereditary and genetics were perceived not to cause Acne (p=0.004). This was in support of a Pakistani study where the Acne was not believed to be a familial disease.\cite{22} A British case-control study in 2005, however, found a greater risk of Acne in relatives of control proving genetic association.\cite{25} More than half (52.8\%) of the students used topical agents to be the treatment for Acne as compared to a medicated soap (66\%) in Nigeria.\cite{19} As is the case with another Pakistani research, our study also shows that misconceptions were pervasive among undergraduate medical students.\cite{24} This is probably because the subject is not given adequate importance as a general community pathology and is taught only as a final year subject.\cite{25} We advocate that medical universities give it relevance by teaching about it from pre-clinical years. Also, if these beliefs are not addressed, medical students could spread the misinformation to the general community.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|}
\hline
Variable & N\% \\
\hline
Gender & \\
Male & 50 (29.4) \\
Female & 120 (70.6) \\
\hline
Age (year) & \\
18-21 & 105 (61.8) \\
22-25 & 65 (38.2) \\
\hline
Social Status & \\
Single & 169 (99.4) \\
Married & 1 (0.6) \\
\hline
Residence & \\
Urban & 141 (82.9) \\
Rural & 29 (17.1) \\
\hline
Year of Study & \\
1\textsuperscript{st} year MBBS & 34 (20) \\
2\textsuperscript{nd} Year MBBS & 34 (20) \\
3\textsuperscript{rd}-year MBBS & 34 (20) \\
4\textsuperscript{th}-year MBBS & 34 (20) \\
Final year MBBS & 34 (20) \\
\hline
\end{tabular}
\caption{Sociodemographic details of all medical students involved in this study (N=170)}
\end{table}

\begin{table}[h]
\centering
\begin{tabular}{|c|c|}
\hline
Prone skin & N\% \\
\hline
dry & 12 (7.1) \\
normal & 7 (4.1) \\
oily & 134 (78.8) \\
any skin & 17 (10) \\
\hline
\end{tabular}
\caption{Knowledge about skin type most prone to Acne among medical students (N=170)}
\end{table}

Table 1: Sociodemographic details of all medical students involved in this study (N=170)

Table 2: Knowledge about skin type most prone to Acne among medical students (N=170)

This is because Acne is not just a skin problem but has a far-reaching psychological impact on its patients.\cite{15,18,27} Lifestyle was significantly related to gender where females suffered exacerbations of Acne in periods of stress (p=0.02). Chiu A also found a positive correlation between acne severity grade and mean perceived stress scores during examinations in university students (p<0.01).\cite{28} This was explained in a 2017 study where the basis of the association was due to an interaction of cutaneous neurogenic factors such as corticotropin-releasing hormone, melanocortins, and substance P, with a pathogenic cascade involving cutaneous microbial residents and
the immune system in Acne.[29] Authorities should arrange stress management seminars and counselling sessions to address and improve the psychological health of medical students, especially females.[30] No significance was found between hormones (p=0.9) or a diet including chocolates and coffee (p=0.6), dairy products (p=0.4), and fried, processed food items (p=0.4) as lifestyle factors causing Acne. This proved that although the hormonal change was believed to be an important causative factor, many patients in our study did not experience this link.

CONCLUSION

The results of this study indicate a high prevalence of Acne among Pakistani medical students, especially females. Lack of knowledge about Acne is widespread among medical students. Efforts should be made to improve knowledge about Acne in medical students to alleviate the burden of this common skin disease from the community.

RECOMMENDATIONS

The results of this study indicate a high prevalence of Acne among Pakistani medical students, especially females. Lack of knowledge about Acne is widespread among medical students. Efforts should be made to improve knowledge about Acne in medical students to alleviate the burden of this common skin disease from the community.

REFERENCES


2. Zohra FT, Sultana T, Islam S, Nasreen T.
### Table 4: Cross-tabulation of lifestyle factors associated among medical students with Acne according to gender (N=110)

<table>
<thead>
<tr>
<th>Lifestyle Factors</th>
<th>Response</th>
<th>Male (n=35)</th>
<th>Female (n=75)</th>
<th>Total (N=110) %</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is Acne related to hormonal changes in the body?</td>
<td>yes</td>
<td>31</td>
<td>67</td>
<td>98 (89.1)</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>4</td>
<td>8</td>
<td>12 (10.9)</td>
<td>0.9</td>
</tr>
<tr>
<td>Experience acne breakouts during stress</td>
<td>yes</td>
<td>21</td>
<td>60</td>
<td>81 (73.6)</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>14</td>
<td>15</td>
<td>29 (26.4)</td>
<td>0.02</td>
</tr>
<tr>
<td>Suffer Acne and disturbed sleep at the same time</td>
<td>yes</td>
<td>9</td>
<td>34</td>
<td>43 (39.1)</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>26</td>
<td>41</td>
<td>67 (60.9)</td>
<td>0.05</td>
</tr>
<tr>
<td>Frequently eat chocolates and drink coffee</td>
<td>yes</td>
<td>18</td>
<td>34</td>
<td>52 (47.3)</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>17</td>
<td>41</td>
<td>58 (52.7)</td>
<td>0.6</td>
</tr>
<tr>
<td>Are you obese?</td>
<td>yes</td>
<td>4</td>
<td>16</td>
<td>20 (18.2)</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>31</td>
<td>59</td>
<td>90 (81.8)</td>
<td>0.2</td>
</tr>
<tr>
<td>Consume dairy products excessively</td>
<td>yes</td>
<td>14</td>
<td>24</td>
<td>38 (34.5)</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>21</td>
<td>51</td>
<td>72 (65.5)</td>
<td>0.4</td>
</tr>
<tr>
<td>Eat fried, junk and processed food items</td>
<td>yes</td>
<td>24</td>
<td>57</td>
<td>81 (73.6)</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>11</td>
<td>18</td>
<td>29 (26.4)</td>
<td>0.4</td>
</tr>
<tr>
<td>Use antibacterial soaps, body washes, face washes and creams to reduce Acne</td>
<td>yes</td>
<td>22</td>
<td>42</td>
<td>64 (58.2)</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>13</td>
<td>33</td>
<td>46 (41.8)</td>
<td>0.5</td>
</tr>
<tr>
<td>Wash skin properly</td>
<td>yes</td>
<td>29</td>
<td>68</td>
<td>97 (88.2)</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>6</td>
<td>7</td>
<td>13 (11.8)</td>
<td>0.2</td>
</tr>
</tbody>
</table>


AUTHOR CRediT

HA: Conceptualization, Formal Analysis, Investigation, Resources, Data Curation, Writing – original draft, Editing, Review & editing
JA: Validation, Investigation, supervision, Resources, Project administration, Data curation, Visualization, Formal Analysis, Writing – original draft, Writing, Review & editing
MI: Conceptualization, Investigation, Data curation, Methodology, Writing – original draft

HOW TO CITE

ETHICAL CONSIDERATION
This study was approved by the Institutional Review Board of Rawalpindi Medical University, Rawalpindi, Pakistan on 22-05-2019 via letter no 2019-M-36.

ACKNOWLEDGEMENT
The authors would like to acknowledge Dr Abdul Qudus (Demonstrator, Department of Community Medicine, Rawalpindi Medical University) for his guidance and encouragement during this research project. The authors would also like to acknowledge Syed Muhammad Jawad Zaidi and Mehwish Kaneez (5th year Medical students, Rawalpindi Medical University, Rawalpindi) for their assistance in data collection procedure.

CONFLICT OF INTEREST
The author declared no conflict of interest.

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