Abstract
Background: Acne vulgaris is a common disease among adolescents. There is a paucity of information on knowledge and understanding of acne patients about their condition.
Objective: This study was carried out to evaluate beliefs and perceptions of acne patients toward their understanding of disease, treatment options, and information sources.
Materials and Methods: A cross-sectional study was conducted on 200 acne patients by means of a questionnaire during 2013–2014 at MMIMSR, Ambala. An adapted version of the questionnaire of Brigitte et al. was used and was modified to suit Indian sentiments.
Results: A total of 200 acne patients were participated in the study. Mean age of participants was 19.80 years. Male:female ratio was 2:1. Causes implicated were diet (85%), puberty (65%), and mood swings (46%). Fatty food and stress were most common agents held responsible for acne flaring. Popular sources of information were friends and parents. 102 patients had used steroids one way or the other. Acne was considered curable by 65% with an anticipated duration of treatment lasting up to 12 months.
Conclusion: Misconceptions are widespread among the population. A health education program is needed which should be included in school curriculum to improve their understanding of the condition.

Key Words: Acne, knowledge attitude and practices, misconceptions, steroid use

Introduction
Acne vulgaris is a chronic, self-limiting inflammatory disorder of the pilosebaceous units affecting individuals in the adolescent age group. It is an extremely common condition with the prevalence rate of around 91% in males and 79% in females in adolescence while in adulthood, it is more common in women. Literature is full of studies that analyze clinicopathologic and treatment aspects of this common disorder. From the current literature, it is evident that patients are not well informed about the causes of acne vulgaris and the modalities of treatment. Despite acne being so common, studies on the knowledge and understanding of the patients toward this disorder have occasionally been reported in Indian subcontinent. Proper data of such information can lead to increased awareness and development of programs to improve patients understanding of the condition as well as treatment compliance. The aim of this study was to analyze the data collected from acne patients regarding their beliefs and perceptions about acne and to compare them with the preexisting literature. Extensive literature search failed to reveal any study of this kind on Indian patients.

Materials and Methods
This was a cross-sectional study carried out in 200 patients of acne vulgaris attending Dermatology Department of MMIMSR, Ambala, from January 2013 to December 2013. The participants were selected by systemic random sampling technique. The study had been approved by the Institute Ethical Review Committee. All participants above the age of 13 years and either sex completed the questionnaire anonymously during outpatient department time. The participation was totally voluntary in nature. The aim was to evaluate beliefs and perceptions of Indian toward acne. Clinical
severity of acne was assessed using Global Acne Grading System (GAGS) developed by Doshi et al.[1] A questionnaire adapted from Brigitte et al.[3] was administered to the participants. This questionnaire was pilot tested in fifty patients for comprehension. Various parameters assessed in the questionnaire included duration of disease, beliefs, and perceptions of patients regarding the causes and aggravating factors of acne, source of information, its impact on friendship, self-image, family, occupation, the medications used before seeking medical advice, and the knowledge of prescribed acne medications and time taken to achieve substantial improvement with appropriate therapy. For evaluating patient’s knowledge toward steroids and its use in acne vulgaris, few additions were made in the questionnaire.

After all the data had been collected, it was tabulated and the statistical analysis was performed using SPSS (software released 2008 for windows 2008 version 17.0. Chicago. SPSS Inc).

Results

Description of the population and severity of acne

Majority of participants were male at 66.5%. Most of them were between 16 and 21 years of age [Graph 1] with an average mean age of 19.80 years. Majority were students (79.5%) and had completed or were pursuing graduation. Forty-six percent had acne onset between 16 and 18 years of age with mean age of acne onset was 17.98 years. Around 45% reported their acne duration for more than a year. Majority of participants (81.5%) had mild GAGS severity. Score range was 7–36. The association between GAGS and sex differentiation was not statically significant ($P = 0.414$). Mean GAGS score was 13.59 with standard deviation of 6.165. A compiled demographic details and GAGS score are given in Table 1.

Opinion about acne and factors influencing it

Eighty-eight percent believed acne as a normal phenomenon at teenage. Diet (85%) and puberty (65%) were two most common implicated acne causes. Common aggravating factors implicated were fatty food (63%) or stress (46.5%). Interestingly, 45% believed regularly washing face helped reduce the incidence of acne.

| Age (years) | Males (%) | Females (%) | Total (%) |
|-------------|-----------|-------------|-----------|
| <16         | 7 (3.5)   | 2 (1.0)     | 9 (4.5)   |
| 16-21       | 97 (48.5) | 45 (22.5)   | 142 (71)  |
| ≥22         | 29 (14.5) | 20 (10.0)   | 49 (24.5) |

| Occupation | Males (%) | Females (%) | Total (%) |
|------------|-----------|-------------|-----------|
| Students   | 107 (53.5)| 52 (26.0)   | 159 (79.5)|
| Business   | 1 (0.5)   | 0           | 1 (0.5)   |
| Miscellaneous* | 25 (12.5) | 15 (7.5) | 40 (20) |

| Education | Males (%) | Females (%) | Total (%) |
|-----------|-----------|-------------|-----------|
| Up to 5th class | 1 (0.5) | 0 | 1 (0.5) |
| 6th to 12th class | 51 (25.5) | 19 (9.5) | 70 (35) |
| Graduates | 76 (38) | 45 (22.5) | 121 (60.5) |
| Postgraduates | 5 (2.5) | 3 (1.5) | 8 (4) |

| Duration of acne (months) | Males (%) | Females (%) | Total (%) |
|---------------------------|-----------|-------------|-----------|
| <3                        | 20 (10)   | 14 (7)      | 34 (17)   |
| 3-6                       | 22 (11)   | 15 (7.5)    | 37 (18.5) |
| 6-12                      | 28 (14)   | 11 (5.5)    | 39 (19.5) |
| >12                       | 63 (31.5) | 27 (13.5)   | 90 (45)   |

| GAGS score | Males (%) | Females (%) | Total (%) |
|------------|-----------|-------------|-----------|
| Mild (1-18) | 105 (52.5)| 58 (29)     | 163 (81.5)|
| Moderate (19-30) | 24 (12.5) | 8 (4)      | 32 (16)   |
| Severe (30-38) | 4 (2)    | 1 (0.5)    | 5 (2.5)   |

*Homemakers and farmers. GAGS: Global Acne Grading System

Graph 1: Age- and gender-wise distribution

Graph 2: Perceived causes of acne
Most participants agreed that acne could resolve spontaneously (64.5%) while 23% had no opinion about its curability. Patient’s opinion regarding causation, aggravating, and relieving factors is given in Tables 2 and 3.

**Opinion about acne care and physician consultation**

Participants felt that acne should be treated with drugs/ointment prescribed by doctor (97.5%), use of personal hygiene products (37.5%), or by applying cosmetics (32%). Another 76% believed that having a healthy lifestyle would help reduce the incidence of acne [Table 4]. Eighty-seven percent believed ointments and creams as effective cure of acne with their daily use. Only 52.5% regularly visited a specialist while 26% went once or twice. Most common reason for this irregular visit was belief of self-curability of acne and ineffective treatment (32.5%). Half of the respondents believed that maximum duration of treatment would be 12 months. Information regarding acne was mostly sought from friends or parents [Graph 4].

**Opinion about steroid use**

One hundred and fifty participants had heard about steroids while 51% gave a history of steroid use. Male:female ratio of steroid use was 2:1. Of 102 steroid users, 88 respondents belonged to 16–21 age range. Most of them were students with 74% having completed graduation. About 17 patients were in 10th–12th standard. One hundred patients had used topical formulation while remaining two gave a history of steroid tablet intake [Graph 5]. The source of prescription was ascertained and it was found that 32 patients of 102 had used steroid on the advice of friend, pharmacist, or on their own [Graph 6]. Rest of the patients were prescribed its use by MBBS doctors (n = 28) or practitioner of alternate medicine (n = 42). Sixty-nine percent (n = 70) of the steroid users reported an initial improvement while 22% noticed no change initially. Lesions later flared up in both these groups [Graph 7]. Ten percent patients gave a history of direct aggravation in lesions on steroid application. Eighty-seven percent had used steroid for a duration ranging from 1 to 6 months (n = 89).

**Discussion**

In this study, we found that males were twice as affected by acne than females, a finding also observed by Krowchuk et al. and Walker and Lewis-Jones. In contrast, Rasmussen and Smith from Michigan and Tallab noted predominant female affliction. 

### Table 2: Opinion about perceived causes of acne

| Commonly perceived etiology | Agree | Disagree |
|----------------------------|-------|----------|
| Due to puberty             | 86 (43) | 47 (23.5) |
| Due to hormones            | 69 (34.5) | 64 (32) |
| Due to diet                | 113 (56.5) | 20 (10) |
| Due to mood                | 66 (33) | 67 (33.5) |
| Parental inheritance       | 14 (7) | 119 (59.5) |
| Infectious disease         | 39 (19.5) | 94 (47) |
| Due to physical contact    | 16 (8) | 117 (58.5) |

### Table 3: Aggravating and relieving factors

| List of factors | Improve | Worsen | Don’t know |
|----------------|---------|--------|------------|
| Washing face   | 65 (32.5) | 1 (0.5) | 68 (34) |
| Chocolates     | 0       | 14 (7) | 118 (59) |
| Fatty food     | 0       | 82 (41) | 52 (26) |
| Mood           | 0       | 39 (19.5) | 94 (47) |
| Stress         | 0       | 63 (31.5) | 70 (35) |
| Squeezing spots| 0       | 55 (22.5) | 78 (39) |
| Pollution      | 0       | 41 (20.5) | 91 (45.5) |
| Sunlight       | 0       | 42 (21) | 91 (45.5) |

### Table 4: Treatment modalities reported by the participants

| Different treatment modalities | n (%) |
|--------------------------------|-------|
| Drugs prescribed by doctors    | 195 (97.5) |
| Healthy lifestyle              | 152 (76) |
| Personal hygiene products (face wash) | 75 (37.5) |
| Ointment purchased from chemist| 70 (35) |
| Cosmetic products (makeup kits)| 64 (32) |
In the present study, 75.5% of the patients belonged to the age group of 16–21 years. The mean age of the participants was 19.80 years. Participants in the study of Al-Hoqail,[7] Tallab,[2] and Tan et al.[8] were in the similar age group where mean age ranged from 18.1 to 21.7 years while some studies[9-11] had dissimilar mean age of participants on a lower mean age ranging from 14.7 to 16.7 years. Forty-five percentage of our patients had acne for more than 12 months similar to 49.5% of participants in a French study.[3]

Students (79.5%) constituted majority in the present study. Identical occupational breakup was noted in a French study.[3] With regard to education level, findings in this study were compatible to survey of Rasmussen and Smith.[6]

Eighty-two percent of our study participants had mild acne while 16% had moderate acne according to GAGS score. Only 2.5% had severe acne. This was consistent with findings of Yahya[11] and Lucky et al.[12]

Although it is an accepted fact by dermatologist that no relation between diet and acne exist, majority of the respondent of this study believed otherwise. Diet (85%) and mood fluctuation (46%) were listed as some of the etiological agent. Interestingly, frequent face washing was considered somewhat beneficial by 45%. Our study population felt fatty food, stress, and repeatedly squeezing acne spots could aggravate acne. There are different beliefs
and perceptions regarding causes and aggravating and relieving factors of acne prevalent worldwide. Compiled analysis of the same is given in Tables 5 and 6.

Most common sources of information in the present study were friends (45.5%), parents (35%), or internet (22.5%) similar to survey of Smithard et al.\[^{13}\] and Karciauskiene et al.\[^{14}\] In contrast, television (73.5%) was found as a major source in another study.\[^{15}\] A comparative analysis is given in Table 6.

Majority of our participants believed in getting acne treated either by products prescribed by doctor (97.5%), by having healthy lifestyle (76%), by use of personal hygiene products (37.5%), ointments prescribed by chemist (35%) and cosmetics (32%). Similarly, Brigitte et al.\[^{3}\] observed that medicines advised by doctor (95%), ointment by pharmacist (93%), healthy lifestyle (90%), personal hygiene products (52%), and cosmetics products (49%) were quoted as different ways of managing acne. A compiled table of different ways of managing acne by participants of various studies is given in Table 7.

Majority of the respondents in the present study preferred topical therapy (86.5%) while 7% preferred both topical as well as systemic modalities and rest as systemic form. Similarly, participants in a French study of Brigitte et al.\[^{3}\] believed topical (57%) to be more effective than systemic therapy (18.8%). In contrast, majority gave no preference to any specific form of treatment in Turkish study of Gokdemir et al.\[^{16}\]

As a dermatologist, we come across numerous cases of patients who are seeking medical care and treatments for acne for years but have very little correct knowledge about it. A lot of misinformation regarding this disease does exist among youths who are the largest population affected. Although an ample number of studies with regard to acne in the literature are present, the percentage of studies evaluating knowledge and beliefs of youth among them is too little. Surprisingly, no Indian study till date has looked into the knowledge and attitude of acne patients. This is important because there are effective therapies available in acne which can cause improvement in quality of life and psychological health. The present study was aimed to assess the beliefs and perceptions of acne patients. Another original aspect

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**Table 5: Major studies regarding beliefs about acne**

| Authors               | Population       | Beliefs regarding causality and exacerbating or ameliorating factors                                                                 |
|-----------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Present study         | Acne patients    | Diet, puberty, hormone, mood, infectious disease, parental inheritance                                                          |
| Al-Hoqail\[^{7}\]     | Students         | Stress, diet, infectious nature                                                                                                  |
| Tallab\[^{2}\]        | Acne patients    | Hormone, diet, dirt, cosmetics, heat, sweating, stress, drugs                                                                     |
| Rigopoulos et al.\[^{20}\] | Students | Diet, hormone, poor hygiene, stress, hormone, infection and genetics                                                            |
| Yahya\[^{11}\]        | Students         | Diet, poor hygiene, obesity, parental inheritance                                                                                |
| Uslu et al.\[^{9}\]   | Students         | Food, poor hygiene, hormone, parental inheritance, stress, diet, heat and humidity, cosmetics, exercise and sweating               |
| Tan et al.\[^{8}\]    | Acne patients    | Hormones, inheritance, diet, poor hygiene, infections                                                                           |
| Smithard et al.\[^{13}\] | Pupils | Diet, poor hygiene, hormones, genetics, infections                                                                              |
| Rasmussen and Smith\[^{6}\] | Acne patients and relatives | Stress, diet, poor hygiene                                                                                                           |

**Table 6: Comparative analysis of sources of information in different studies**

| Present study | Friends, parents, internet                                                                 |
|---------------|------------------------------------------------------------------------------------------|
| Tallab\[^{2}\] | Magazine, television, newspaper, radio, school, parents, relatives, friends, pharmacist, library |
| Rigopoulos et al.\[^{20}\] | Parents, dermatologist, magazine, television, pharmacist, friend |
| Tan et al.\[^{8}\] | Physician, magazines, television, parents, friends |

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Graph 7: Effects of steroid use

Worsening | Initial improvement then worsening | No change initially then worsening | Eventual worsening
of this study was that it also evaluated the prevalence and misinformation in relation to steroid use in acne patients in Indian scenario.

Besides this, we see a regular number of acne patients who give a history of steroid use for acne. The major benefit of topical corticosteroid lies in the rapidity of initial relief. This misuse of steroid is prevalent as patients are easily able to procure them. In the present study, steroid use by males was found to be higher while in another Indian study, female users were significantly higher.[17] In our study, more than half had misused steroid while corresponding figure was 15% in a multicentric study conducted by Saraswat et al.[16] Most of our participants were graduates and largest number of participants belonged to 16–21 age while in an Indian study, 51% had studied till 8th class and mostly belonged to age group of 21–30 years.[17] Almost all the users in our study were students while in a Pakistani study,[16] this figure was 53%. Almost everyone in our group had used cream or ointment form of steroid. In our study, 69% were recommended steroid from a medical source while 50.2% in a study were recommended its use by friend or relative.[17] Again in the present study, 87% had used steroid for duration ranging from 1 to 6 months while this figure was 48% in a study.[17-18] A total of 10 out of 102 users noticed worsening of lesions from the start and rest of the users reported adverse effects after a period of few weeks to months while 90% reported adverse effects in an Indian study.[17]

Despite all the shortcomings in the treatment, a large number of patients in the present study were optimistic of permanent cure of acne. Similarly, findings were noted in the study of Pearl et al.[15] and Gokdemir et al.[14] where around 80% believed the same thing.

**Conclusion**

This study showed that misconception and false beliefs on acne are widespread among the Indian population.

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**References**

1. Doshi A, Zaheer A, Stiller MJ. A comparison of current acne grading systems and proposal of a novel system. Int J Dermatol 1997;36:416-8.
2. Tallab TM. Beliefs, perceptions and psychological impact of acne vulgaris among patients in the Assir region of Saudi Arabia. West Afr J Med 2004;23:85-7.
3. Brigitte D, Revuz J, Pawin H, Moyse D, Faure M, Chivot M, et al. Acne as seen by adolescents: Results of questionnaire study in 852 French individuals. Acta Derm Venereol 2011;91:531-6.
4. Krowchuk DP, Stancin T, Keskinen R, Walker R, Bass J, Anglin TM. The psychosocial effects of acne on adolescents. Pediatr Dermatol 1991;8:332-8.
5. Walker N, Lewis-Jones MS. Quality of life and acne in Scottish adolescent schoolchildren: use of the Children's Dermatology Life Quality Index (CDLQI) and the Cardiff Acne Disability Index (CADI). J Eur Acad Dermatol Venereol 2006;20:45-50.
6. Rasmussen JE, Smith SB. Patient concepts and misconceptions about acne. Arch Dermatol 1983;119:570-2.
7. Al-Hoqail IA. Knowledge, beliefs and perception of youth toward acne vulgaris. Saudi Med J 2003;24:765-8.
8. Tan JK, Vasey K, Fung KY. Beliefs and perceptions of patients with acne. J Am Acad Dermatol 2001;44:439-49.
9. Uslu G, Sendur N, Uslu M, Savk E, Karaman G, Eskin M. Acne: prevalence, perceptions and effects on psychological health among adolescents in Aydin, Turkey. J Eur Acad Dermatol Venereol. 2008;22:462-9.
10. Payin H, Chivot M, Beylot C, Faure M, Poli F, Revuz J, et al. Living with acne. A study of adolescents' personal experiences. Dermatology 2007;215:308-14.
11. Yahya H. Acne vulgaris in Nigerian adolescents – prevalence, severity, beliefs, perceptions, and practices. Int J Dermatol 2009;48:498-505.
12. Lucky AW, Biro FM, Huster GA, Morrison JA, Elder N. Acne vulgaris in early adolescent boys. Correlations with pubertal maturation and age. Arch Dermatol 1991;127:210-6.
13. Smithard A, Glazebrook C, Williams HC. Acne prevalence, knowledge about acne and psychological morbidity in mid-adolescence: a community-based study. Br J Dermatol 2001;145:274-9.
14. Karciuskiene J, Valiukeviene S, Stang A, Gollnick H. Beliefs, perceptions, and treatment modalities of acne among schoolchildren in Lithuania: a cross-sectional study. Int J Dermatol 2015;54:e70-8.
15. Pearl A, Arroll B, Lello J, Birchall NM. The impact of acne: a study of adolescents' attitudes, perception and knowledge. NZ Med J 1998;111:269-71.
16. Gokdemir G, Fisek N, Köslü A, Kutlubay Z. Beliefs, perceptions and sociological impact of patients with acne vulgaris in the Turkish population. J Dermatol 2011;38:504-7.
17. Saraswat A, Lahiri K, Chatterjee M, Barua S, Coondoo A, Mittal A, et al. Topical corticosteroid abuse on the face: a prospective, multicenter study of dermatology outpatients. Indian J Dermatol Venereol Leprol 2011;77:160-6.
18. Rehman F, Niazi NA. Beliefs and perceptions about acne among undergraduate medical students. JPAD 2007;17:231-4.
19. Mosam A, Vawda NB, Gordhan AH, Nkwanyana N, Aboobaker J. Quality of life issues for South Africans with acne vulgaris. Clin Exp Dermatol 2005;30:6-9.
20. Rigopoulos D, Gregoriou S, Ifandi A, Efstathiou G, Georgala S, Chalkias J, et al. Coping with acne: beliefs and perceptions in a sample of secondary school Greek pupils. J Eur Acad Dermatol Venereol 2007;21:806-10.