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Impact of Acne on the Quality of Life of Adolescent School Children and University Students

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Abstract

Acne is a common skin disorder caused due to the inflammation of pilosebaceous units in the skin and has affected around 9.4% of the global population. This study evaluated the impact of acne on the quality of life (QoL) of adolescent school children and university students in Sri Lanka. The study also assessed the treatment methods, risk factors, and associations between acne severity and risk factors. A cross-sectional analytical study was conducted using 100 advanced level students and 200 university students with self-reported acne. Data were collected using a self-administered questionnaire with the Children's Dermatology Life Quality Index (CDLQI). The family history, premenstrual period, cosmetic usage, stress, oily skin, and oily foods were identified as severity factors for acne. There were statistically significant associations between acne severity and risk factors; oily food ($\chi^2 = 15.241$, $P = 0.002$), family history ($\chi^2 = 15.241$, $P = 0.002$), premenstrual period ($\chi^2 = 16.593$, $P = 0.001$), and oily skin ($\chi^2 = 30.952$, $P = 0.000$). The majority, 55% of school children and 73% of university students use home remedies to treat acne. The mean score of CDLQI was 1.3 in school children and 2.13 in university students. There was a statistically significant association between severity of acne and QoL ($\chi^2 = 72.834$, $P = 0.000$). The university students presented higher experiences of the impact of acne on QoL than school children.

Keywords: Acne, Adolescent, Quality of life, Risk factors, School children, University students

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Introduction

Acne is a common skin disorder, which is considered as the eighth most prevalent disease worldwide affecting around 9.4% of the global population.[1] Acne is not infectious, but it can be hereditary. The World Health Organization (WHO) defines acne as an inflammatory disease of pilosebaceous units in the skin of the face, neck, chest, and back. Mostly, acne appears at the age of 12–25 years. The onset age of acne lesions in many reported cases is 16 years.[2,3] Usually, acnes can be detected during early puberty due to androgenic stimulation, which triggers the production of sebum into the pilosebaceous unit, excessive production of sebum, abnormal follicular keratinization, colonization of Gram-positive bacterium, and local inflammation.[4] These events combine to create an environment within the pilosebaceous unit that is conducive to colonization of the commensal bacteria. Propionibacterium acnes secrete numerous inflammatory molecules and chemotactic factors. These chemical constituents initiate and propagate local inflammatory response and also induce keratinocyte hyperproliferation.[5]

Acne is categorized into three main parts; mild, moderate, and severe.[6] Patients with mild acne presence few to several papules and pustules, but not have nodules. With moderate acne, patients have several many papules and pustules, along with few to several nodules and severe acne condition is characterized by numerous or extensive papules and pustules, and many nodules.[6]

Acne is not a life threatening or physically debilitating disease, but its inflammatory process leads to formation of pustules, abscesses, nodule lesions and scarring, causing a great psychological impact on people.[7] Appearing of acne lesions in most exposed areas such as face and thorax leads to the feeling of guilt, shame, and social isolation.[8] People with acne have a higher unemployment rate than those without acne.[9] Depression, anxiety, and anger influenced by acne may cause impairment of self-image and affected on psychological well-being; including ability to form relationships with peers, family, and others, and may even precipitate suicidal thoughts.[9] Acne also can leave physical and emotional scars and can persist throughout the life of the affected person.[10] People with acne also have negative interference on emotional functioning, social functioning, leisure activities, sleep, education, and occupation.[11]

Investigation of the impact of acne and its severity on the quality of life (QoL) and psychic health is very important. Because the symptoms and body image correlated with the severity of acne in which moderate and severe acne exhibited greater psychological and emotional impairment with the QoL.[12] Even though acne has been identified as a globally affected skin disease, its effect on the QoL of geographically, sociologically different groups of people, and related risk factors may not the same and have not been adequately studied. Therefore, this study was focused to determine the impact of acne on the QoL and psychological functioning of the advanced level students and university students in Sri Lanka. The study also assessed the risk

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factors and treatment methods used for acne to identify the key factors that can be considered when taking measures to improve the QoL of people suffering from acne.

Methods

Study Design

A cross-sectional analytical study was conducted among 100 advanced level students who presented self-reported acne at the Sri Devananda College in Galle district, Southern Province, Sri Lanka and 200 university students who presented self-reported acne at the Faculty of Allied Health Sciences (AHS), representing health science undergraduates and the Faculty of Art, representing non-health-related undergraduates of the University of Peradeniya, Sri Lanka. Out of 200 university students, 100 were selected from each faculty. The students who did not presence of self-reported acne and did not give the consent for participation in this study were excluded from the study.

Data Collection

The data collection tool was the self-administered questionnaire, which included socio-demographic data, disease characteristics, awareness of risk factors and treatment methods, impacts on QoL, and psychological health. The Children Dermatology Life Quality Index (CDLQI) was used to assess the impairment in QoL of affected participants. It was a ten-item simple questionnaire designed by Lewis-Jones and Finlay (1993)[13] and scores range from 0 to 30. The higher a score, the more impaired the QoL is considered. The above tool was used with permission of the initial author and translated and validated to Sinhala and Tamil versions to use in this study. Pre-testing of the questionnaire was performed before data collection.

Statistical Analysis

All responses were checked for their completeness to exclude missing or inconsistent data. Data were analyzed using the statistical software Statistical Package for the Social Sciences. The results were interpreted using frequency, percentage, and Chi-square test. A probability of $P \leq 0.05$ was considered as significant.

Ethical Consideration

Ethical approval was obtained from the institutional research committee of the Faculty of AHS, University of Peradeniya, Sri Lanka (AHS/ERC/2018/68, 28 November, 2018). The permission was also obtained from the Zonal Educational Office in Ambalangoda, Sri Lanka, for the school participants. Informed written consent was obtained from all the individual participants included in the study after explaining the purpose of the research. The data were collected without any disturbances for academic work.

Results

Socio-demographic Data

A total of 300 participants; 100 advanced level school children, 100 students of the Faculty of AHS, and 100 students of the Faculty of Art, University of Peradeniya, Sri Lanka participated in this study. The response rate of the calculated sample size was 100%. The ages of the participants were from 18 to 26 years. Mean age of school students was 18.3 years (SD ± 0.17), and a mean age of university students was 23.5 years (SD ± 1.56). The majority of school participants (51%, $n = 51$) and university participants (71%, $n = 142$) were female.

Severity of Acne

The majority of the school children and university students had mild (37.0% and 45.5% respectively) and moderate (47.0% and 40.5%, respectively) acne conditions. Less number of participants (2% of school children and 0.5% of university students) had severe acne condition in both settings. About 14.0% of school children and 13.5% of university students did not know their acne condition.

Affected Body Parts of Acne

All of the participants (100%) presented facial acne. School children presented acne in various other body parts, including in back (12%), chest (7%), and other body parts (3%). University students presented acne in the back (16.5%), chest (10.5%), and other body parts (5%). The second most affected area was the back of the body. The percentages of the distribution of acne scars among school children and university students were 72% and 62.5%. Altogether, 65.7% of the study population presented acne scars.

Risk Factors of Acne

The identified risk factors for acne are given in Figure 1. When considering school children, consumption of oily foods (89%), oily skin (63%), and stress (56%) was identified as the main risk factors for acne. Similar to school children, university students also had the same prominent risk factors; oily food (82.5%), oily skin (53%), and stress (76%). However, the effect of stress was higher among university students than the school children. Premenstrual period and usage of cosmetics have also been identified as risk factors.

Association between Acne Severity and Risk Factors

The associations between acne severity and family history, premenstrual period, cosmetic usage, stress, and oily skin are

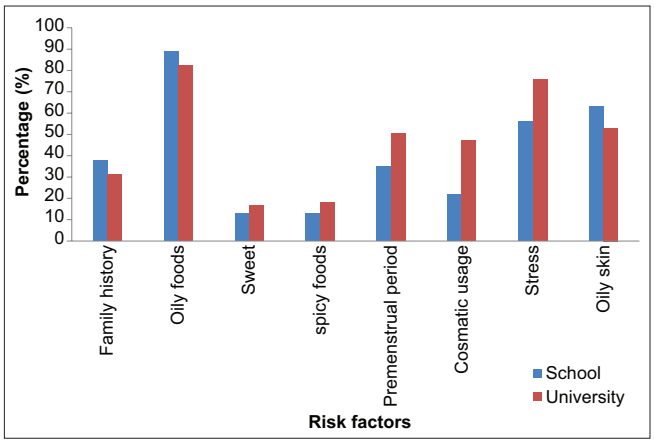

Figure 1: Distribution of risk factors of acne among school children and university students

explained in Table 1. According to the data collected from 300 participants, 100 (33.3%) had a positive family history of acne. Among them, mild and moderate acne conditions were (32% and 58%) seen. Students with a family history of acne exhibited a higher prevalence of moderate acne (58%) than those with no family history (35%). Hence, there was a statistically significant association (χ^2 = 15.241, P = 0.002) between severity of acne and family history.

The total female participants of this study were 193 (64.3%). Among them, 136 female participants had a negative impact of menstruation, including mild (41.2%) and moderate acne (48.5%) conditions. The association between acne severity and premenstrual period was statistically significant (χ^2 = 16.593, P = 0.001). Cosmetic usage also causes exacerbation of acne, but it effected on a smaller number of students who had mild and moderate acne conditions. Therefore, no statistically significant (χ^2 = 2.503, P = 0.475) association between acne severity and cosmetic usage was observed. According to the collected data, a higher number of students 208 (69.3%) had reported stress caused exacerbation of acne. Among them, mild and moderate acne was seen with 87 and 94 students. However, the association between acne severity and stress was not statistically significant (χ^2 = 3.630, P = 0.304). The oily skin caused exacerbation of acne in 169 participants. Among them, the majority of students had mild (n = 60) and moderate (n = 93) acne. Therefore, a statistically significant association (χ^2 = 30.952, P = 0.000) was observed between acne severity and oily skin.

Food that we consumed can be divided into three main categories; oily food, sweets, and spicy foods. Out of 300 participants, 254 students had exacerbated acne by consumption of oily food. Among them, 101 and 117 students had mild and moderate acne conditions, respectively. The majority of the students who had moderate and mild acne reported that consumption of oily foods causes exacerbation of acne. The association between acne severity and consumption of oily food was statistically significant (χ^2 = 8.845, P = 0.031). The study findings also revealed that oily foods had been grater affected on acne than spicy and sweet foods among both participants of school and university. The association between acne severity and consumption of sweet food was not statistically significant (χ^2 = 4.085, P = 0.252). Similarly, the association between acne severity and consumption of spicy food was also not statistically significant (χ^2 = 0.698, P = 0.874). The above results highlighted a statistically significant association between acne severity and oily foods but not with sweet foods or spicy foods.

Treatment Methods

The study also focused on the use of treatment methods and attending treatment institutions for acne. According to analyzed data, it revealed that the use of topical medication for acne is higher than oral, laser, and other treatment methods among both study groups. The female university students indicated the highest usage of topical treatment than others. Even though laser treatments can be used effectively and safely for acne with small side effects, among all participants, only 0.5% of university students had used laser treatments.

The study population had a higher preference for home remedies/ herbal treatments rather than getting treatment from the government hospitals, private hospitals, government Ayurvedic hospitals, and private Ayurvedic centers. When considering the educational background of the university students, AHS students have health sciences base educational setup than art students. However, there was no significant difference in the treatment methods between health sciences-based AHS students and non-health sciences based art students. According to the results, 55% (n = 55) school children and 73% (n = 127) university students use home remedies for acne without attending medical institution to get treatment. Among the study population, only 5% had visited government hospitals and 16.3% had visited private hospitals. The use of Ayurveda hospitals for acne treatments was also very low (3%).

Practice and attitudes about the use of treatment methods and medical approval are crucial for greater therapeutics outcome. The majority of participants in school and university had positive attitudes toward treatment usage with proper guidance. University female students group dominates the use of treatment methods than the other student groups in the study.

Psychological Status

The study finding revealed that only a lesser number of students in school and university had psychological issues regarding acne [Figure 2]. The university female student group was the group that psychologically affected mostly due to acne than the other groups. Overall, university students showed psychological issues rather than school students. Among university students, 32.5% (n = 65) thought them like a stressed person due to acne and 35% (n = 70)

Table 1: Association between acne severity and family history, premenstrual period, cosmetic usage, stress, and oily skin

Severity	*Family History*		*Premenstrual period*		*Cosmetic usage*		*Stress*		*Oily skin*	
	Yes	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*
Mild										
n	32	96	56	24	47	81	87	41	60	68
%	32.0	48.0	41.2	42.1	40.5	44.0	41.8	44.5	35.3	51.9
Moderate										
n	58	70	66	16	53	75	94	34	93	35
%	58.0	35.0	48.5	28.1	45.7	40.8	45.2	37.0	55.0	26.7
Severe										
n	0	3	2	0	0	3	1	2	3	0
%	0.0	1.5	1.5	0.8	0	1.6	0.5	2.2	1.8	0
Don't know										
n	10	31	12	17	16	25	26	15	13	28
%	10.0	15.5	8.8	29.8	13.8	13.6	12.5	16.3	7.7	21.4
Total No	100	200	136	57	116	184	208	92	169	131

n: Number, %: Percentage

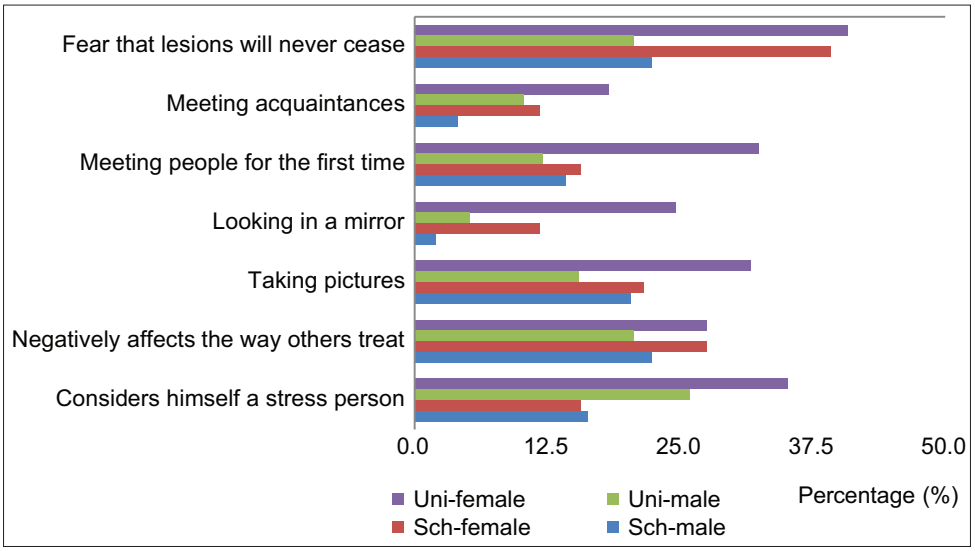

Figure 2: Distribution of psychological status among school children and university students according to gender

indicated fear regarding acne lesions that will never cease. About 31% (n = 31) of school children also showed fear of acne lesions. Therefore, the most prevalent psychological variable among the students was the fear that acne will never cease.

CDLQI Score

The mean score of CDLQI for school children and university students was 1.30 and 2.13, respectively. The majority of school children were in the 0–1 score range (57%, n = 57) of CDLQI. Among university students, majority of them were in the 0–1 score ranges (44.4%, n = 89) and 2–5 score rage (41%, n = 82). Students who were in Faculty of Art (non-health science-based students) and Faculty of AHS (health-science-based students) included 0–1 and 2–5 score ranges of CDLQI with nearly equal percentages. Among university students, low incidences were seen in 6–10 score range (4%) and 11–20 score range (1%). Similarly, there were lesser number of school children in 6–10 score range (11.5%) and 11–20 score range. In these scales, the majority of students in both school and university had an impact on their acne symptoms and had negative feelings on leisure, hobbies, personal relationship, sleep, and treatment. There was no participant with extremely very large effect of acne (21–30) on QoL. According to the analyzed data, there was a statistically significant association between severity of acne and QoL (χ^2 = 72.834, P = 0.000). These results highlight that mild and moderate acne conditions can exhibit impairment of life and impact is higher with moderate than mild acne conditions. Hence, increasing the severity of acne affects the decrease of the QoL.

Discussion

It has been reported that acne is more prevalence in aged between 11 and 35.[3] The selected study population was within the age limit for acne prevalence. According to the results, most of the participants in both educational levels had mild and moderate acne condition, and the same observation has been reported in several other countries.[8,14,15] However, moderate and severe acne conditions than no or mild acne conditions have also been reported in some countries.[14]

Acne lesion can be seen in the different anatomical region of the body.[2,8] All of the participants (100%) presented a greater percentage of facial acne than the presence of acne in other body parts. Acne most commonly appears due to inflammation of pilosebaceous units, and the highest density of pilosebaceous units is distributed in face, neck, chest, shoulde, and back.[4,5] In 99% of reported cases, the face was the affected area than other body areas.[12] Appearing of acne in chin and jawline is also often caused by fluctuation in hormones. It results in excess androgens, which overstimulate the oil glands and clog pores[16] leading face as the most prominent affected areas of the body for acne.

In this study, statistically significant associations between acne severity and risk factors; oily food, family history, premenstrual period, and oily skin were observed. The study findings also revealed that oily foods had been grater affected on acne than spicy and sweet foods. Lipids pass into sebaceous gland through bloodstream and synthesis sebum which causes an increase of acne and could be a reason for significant association with the oily foods and development of acne.[2,17] However, no statistically significant association between acne severity and cosmetic usage was observed. Use of cosmetics is less among school and university students according to the cultural background of the country. However, the usage of cosmetics by the same-age young population who are not in the educational settings may not show the same influence and a positive relationship between cosmetic usage and acne severity may exist among such groups.[18] The use of oily foods, cosmetics, and stress among school children and university student is increasing day by day due to poor food habits, modernized lifestyles, and competition in the education system in the country. Even though these factors are preventable, they have become the major risk factors for acne. Therefore, attention should be given to minimize these risk factors to improve their QoL.

This study also revealed that topical medications are used for acne than oral medication, laser, and other treatment methods. The above practice may be due to the availability of many topical preparations, and people are preferable for creams, lotion, and ointments than oral medications. Laser treatment can be used effectively and safely for acne with small side effects.[19] However, in our study, only 0.5% of university students used laser treatment.

This may be due to limitations for laser treatment option such as time, money, and availability. Home remedies are widely used as treatment rather than getting treatment from the hospitals. Easy access and elder's knowledge and experienced about home remedies that exist in the society from many years may have influenced for these results.[20]

Psychological impairment due to acne is a critical issue in society.[8,21-23] In our study, acne affected psychologically female students than male students. This study also revealed acne-related negative impacts such as thinking as a stressed person, distresses on way the others treat, taking pictures, looking in the mirror, meeting people for the first time, meeting acquaintances, and fear on acne scars. The study also revealed that there was a statistically significant association between severity of acne and QoL.

These findings have not been identified before from a similar study group in the country, and results can be used to improve the QoL of people suffering from acne. Psychological well-being is important to improve QoL. Therefore, apart from providing treatment and minimizing risk factors for acne, the study results also suggest focusing on the above-mentioned negative psychological factors to improve the QoL of the young generation suffering from acne.

Conclusion

Majority of the study group had mild and moderate acne conditions, and all of them presented facial acne. There were statistically significant associations between acne severity and risk factors; family history, oily food, premenstrual period, and oily skin. However, there were no statistically significant associations between acne severity and sweet food, spicy food, stress, and cosmetic usage. There was a statistically significant association between severity of acne and QoL. University students presented higher experiences of the impact of acne on life than school children.

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