

Empowering University Students Through Acne Education: A Community Service Intervention for Skin-Care Knowledge and Practices, Pakistan

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Abstract

Acne vulgaris is a common dermatological problem and has significant psychological and social implications among University students. Although acne is a very common condition, there are still widespread gaps in understanding the pathogenesis, treatment and skin-care habits of acne. Experiential learning based community service interventions have the potential to meet these gaps. The purpose of this community service was to educate university students with different disciplines about knowledge and the care of the skin related to acne. The quasi-experimental pre-post design was used and 30 university student participants (18 males and 12 females) were drawn from three faculties (Medical sciences, Science and Arts) of the university. This intervention consisted of weekly interactive workshops, weekly peer-led discussions, practical demonstrations and take home materials all over a 4-week time frame. The knowledge regarding acne was measured with a validated 25 item questionnaire. Paired samples t-tests were used for analysis. Overall, there was a significant improvement in mean knowledge scores from 59.0% (pre-test) to 70.0% (post-test) (Cohen's $d = 0.96$, $p < 0.001$). Significant growth was seen across all faculty subgroups with the largest relative growth in Arts (51.2% to 65.8%). The community service intervention successfully enhanced knowledge about acne-related among students from all disciplines of the university. The results suggest the importance of integrating structured skin-health education into the community service programs of universities.

INTRODUCTION

Acne vulgaris is one of the most frequently seen dermatological conditions in clinical practice, with its incidence in people on a range of ages from 12 to 25 years (approx. 85%). Within the university population, the prevalence is 49.8-78.5%, which is due to geographical, climatic and methodological differences. It is a state of chronic inflammation of the pilosebaceous units, resulting in comedones, papules, pustules, nodules and, in severe cases, scarring that can last long after lesions have cleared. Four key factors in the pathogenesis of acne are increased sebum production, follicular hyper keratinization, colonization by Cut bacterium *acnes* and inflammatory mediators (Gad Abd Elkader, M Abdlmoty, A Fadel, & Hamed Mohammed, 2025). These pathophysiological mechanisms underscore the importance of early recognition and appropriate management to prevent both physical and psychological sequelae.

The psychosocial burden of acne is substantial and well-documented. Through the years, studies have shown that acne is a major problem in reducing quality of life, increasing social appearance anxiety, and lowering self-esteem, especially in young adulthood during a period of development. In the study of Nigerian undergraduates, there was a significant correlation between anxiety (26.5% vs. 10.3%, $p = 0.004$) and emotional distress (35.4% vs. 10.3%, $p < 0.001$) between acne with PFHP and acne without PFHP. The psychological effects can impact the academic achievement, social participation, and general health of children, making it important to address them appropriately and teach them how to manage. However, there are significant gaps in acne knowledge and suboptimal practices among various university populations, even after lesions are resolved.

Despite its high prevalence, significant gaps persist in acne knowledge and self-care practices among university students. A study of 508 students revealed only 52.2% had satisfactory knowledge and only one-third (33.5%) had satisfactory practices regarding acne. In another study, conducted at the University of Jordan, it was found that some 60% of students at colleges and universities who studied health-related issues showed poor levels of knowledge and that this was linked to age, gender and the college or university discipline studied (Hardani et al., 2024). The results of this study indicate that even students studying the health-related fields may not be aware of the basic knowledge of acne pathogenesis and management. Self-medication practices among University students with acne is of great concern. In a study performed at King Saud University (KSU) in Riyadh, it was found that 56.0% of acne patients self-administered medications without prescription and the most common agents used were topical antibiotics (38.1%), oral antibiotics (22.5%), and topical adapalene (20.9%). The results of these findings are of significance in relation to the delayed professional consultation, the inappropriate selection of treatment, and any potential adverse effects (Vahabi, Lofters, Mishra, Pimple, & Wong, 2022).

Community service, in the form of service-learning, is a pedagogical approach that has been successfully implemented in a wide variety of health education settings and where knowledge gained has been shown to lead to educational and civic outcomes. Service-learning has a long history of documentation in nursing and dental programs, and is well established to promote clinical competence, cultural competence, empathy, and commitment to underserved populations (Lungu, 2022). Service-learning in the field of health education, however, has largely been utilized for educating health profession students, rather than the general university community. Community service activities for skin health education are a potential intervention that could be utilized more effectively to help address this important public health concern, as the university student population is undergoing acne at a high rate and the knowledge gaps are well documented (Shereda et al., 2025).

The present study was designed to address the following gaps in the literature: Despite being known as a common problem among university students, there is a lack of reported knowledge and practice among them, and the potential for community service interventions. Gaps in intensive studies of community service based educational programs for acne include the following: (1) They do not employ quasi-experimental design with pre-post evaluation; (2) They do not include students from a variety of academic disciplines (aside from health profession students); (3) They do not use interactive, peer-led pedagogical approaches (didactic approaches are not used); and (4) They do not investigate the differential effects of the intervention on various demographic and academic subgroups. This is especially

significant as the importance of collaborating with the community in higher education gains momentum and the value of health promotion being delivered beyond healthcare to the places people live and learn is gaining increased focus (Olaoye, Adejumobi, Ogundele, & Akande, 2024). Also, the ongoing use of self-medication and lack of knowledge regarding the proper treatment of acne reveals that the conventional approaches of giving awareness about acne have failed. The community service model, in which education is integrated into the trusted networks of peers, and opportunities for interactive learning, may have benefits over traditional education models (Suryani et al., 2024).

METHODS

Study Design and Setting

The effectiveness of a quasi-experimental structured educational intervention using a one group pre-test/post-test design was used to measure the outcomes of acne-related knowledge and skin-care practices among university students in this community service activity. Quasi-experimental design was chosen because it is highly appropriate for community service settings where randomization might not be feasible or ethical, but yet allows for systematic assessment of the effects of the intervention (Shrestha, Joshi, & Tamang, 2021). This activity period was six weeks long, pre-test assessment took place one week before the intervention, the intervention was delivered over four weeks and the post-test assessment was delivered one week after the intervention was complete. This time sequence provided enough time for the acquisition of knowledge and consolidation, and reduced attrition and recall bias. The six-week structure was informed by previous educational interventions which showed that multi-session programs were more effective in outcomes than single-session programs (Le Goy, 2023). The pre-test was used as a baseline to assess the participants' knowledge about acne before the intervention to determine the gains in knowledge on an individual and group basis. The post-test was given one week after the last intervention session and measured what was learned (as opposed to immediate recall) more effectively.

Population and Subjects

The participants were 30 university students recruited using convenience sampling from three faculties in one university: Faculty of Medical Sciences (n=16), Faculty of Science (n=8) and Faculty of Arts (n=6). Convenience sampling was considered appropriate as the activity was conducted for the purpose of providing service to the community and there were logistical issues involved in recruiting over a number of faculties within a specified time. The sample comprised 18 males (60%) and 12 females (40%) participants, with a mean age of 20.8 years (SD = 1.9, range 18-24). The gender distribution is not perfectly equal but it is representative of that of the faculties participating in the study and is similar to that of previous studies on acne in university students (Zhou, Zhang, Xiao, Yu, & Tang, 2024). This was done because of the inclusion of participants from various academic fields; medical sciences, science, and arts; because previous studies have reported gaps in knowledge in all academic fields including health related disciplines. A representation that is interdisciplinary contributes to the external validity of the results and the generalizability of the intervention to wider populations at the university level. Inclusion criteria included being a full-time undergraduate student, age 18 years or older, and willing to attend all intervention sessions and complete pre- and post-assessments (Morenz et al., 2021). The following exclusion criteria were used: (1) not to participate in formal acne education programs; (2) having any severe dermatological condition that requires active medical treatment; and (3) not being able to give informed consent. The

following criteria were set in place to keep participants safe, reduce the amount of confounding variables, and preserve the integrity of the community service activity (World Medical Association, 2013).

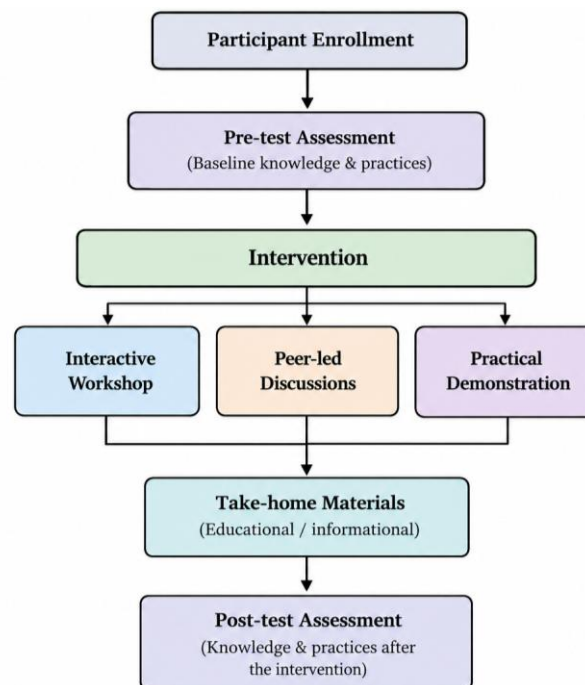
Community Service Procedures

The community service intervention was based on the principles of experiential learning and health education best practices. The intervention consisted of four components:

1. **Component 1: Interactive Educational Workshop (Week 1).** A 90-minute workshop was held that focused on acne pathogenesis, risk factors, evidence-based treatment options, and the correct skin care practices. The workshop had a blended learning approach with short didactic presentations, visuals and interactive questions and answers. A didactic component was intentionally kept to 30 minutes to allow the participants to be engaged and to avoid cognitive overload, in line with adult learning theory which recommends being active rather than passive in absorbing the information (Hardani et al., 2024). The visual aids consisted of diagrams of the pilosebaceous unit, clinical pictures of various grades of acne and infographics on the mechanism of action of popular topical and systemic treatments. The Q&A session gave the participants the chance to pose questions and share their own experiences and misconceptions, offering a chance for the facilitators to fill in gaps in knowledge as they went. This was the building block on which later sessions were based.
2. **Component 2: Peer-Led Small Group Discussions (Week 2).** The participants were organized in smaller groups within each group of which 5 – 6 participants were under the guidance of trained peer educators. Themes discussed were personal experiences with acne, misconceptions, and difficulties with accessing professional assistance for acne, as well as strategies to keep skin-care routine healthy. The peer-led format was chosen on the basis of evidence showing that peer education is especially effective in the university population, where it creates a space for open communication, minimizes stigma, and helps to achieve norms-based behavior change within social networks (Alrasheed, Mansy, & Al-Arifi, 2024). Peer educators were chosen from the participants and then a short training was conducted before starting facilitation of the discussions. A semi-structured discussion guide was given to each group to keep the conversations in the same direction but also be flexible enough to have organic discussion. This component covered the social and psychological aspects of acne that are not always included in only a biomedical educational context.
3. **Component 3: Practical Skin-Care Demonstration (Week 3).** A practical session was held to explain the correct way to wash your face, how to use over the counter products and when you should see your dermatologist. The techniques were practiced with supervision and individual feedback was given. A demonstration of the correct amount of cleanser to use, correct water temperature, gentle cleansing motion, and proper drying technique. The cosmetic products were also demonstrated to participants with their comedogenic and non-comedogenic characteristics, providing them with the knowledge to choose the right skin care products. A decision making flowchart was presented to educate the audience to differentiate mild acne that can be treated with over-the-counter products from moderate to severe acne that needs professional consultation (Dadzie, 2024). This was the part that made the theory into practical skills, following the experiential learning theory that knowledge is best acquired from practical application.

4. **Component 4: Take-Home Educational Materials (Week 4).** Workshop attendees were provided with educational literature that highlighted important topics, such as a quick-reference guide for acne management and resource lists for trusted online information. The materials were printed in a way that would encourage easier readability and understanding by applying plain language and visual elements. The quick reference guide provided a summary of acne triggers, a step-by-step skincare routine and a table comparing common over-the-counter ingredients, how they work and how to use them. Participants were directed to reliable online resources via a list of sites that contained links to evidence-based dermatological sites and dermatology professional organizations. The materials were designed to be used at home as a reinforcement to increase the retention of the information and to share with other people in the home, roommates, and peers. This component acknowledged that health behavior change was not a short-term process and continued reinforcement was necessary after the end of the intervention, using easily-accessed educational material (Ike, 2024).

Figure 1: Conceptual Framework of the Community Service Intervention



Variables and Instruments

The community service educational intervention (CSEI) was the independent variable and consisted of four structured components presented for four consecutive weeks. The dependent variable was the acne-related knowledge, which was assessed with a 25-item instrument which was developed from literature and expert consultation for this activity. The questionnaire consisted of four domains: etiology and pathogenesis (6 items), risk factors and aggravating factors (6 items), treatment modalities (7 items) and skin-care practices (6 items). Each item was marked correct (1 point) or incorrect/don't know (0 point) and the total score out of a maximum of 25 points was transformed into a percentage. Items were checked for content validity by two dermatologists and one health education specialist before administration, and the instrument showed acceptable content validity (Wangkahart, 2023). There was a pilot test of 5 students not participating in the main activity conducted to check

the clarity and understanding of the wording, which led to certain minor changes. Internal consistency was satisfactory (Cronbach's alpha coefficient for the overall scale was 0.78). The four domain structure facilitated the identification of content domain-specific gaps and the assessment of the effectiveness of the intervention across content areas. This multidimensional approach to knowledge assessment is consistent with best practices in health education evaluation, which emphasize the importance of measuring discrete knowledge components rather than relying solely on global scores.

Table 1. Acne Knowledge Assessment Domains

Domain	Number of Items	Sample Item
Etiology and Pathogenesis	6	Acne is primarily caused by poor hygiene
Risk Factors	6	Stress can worsen acne symptoms
Treatment Modalities	7	Antibiotics may be prescribed for moderate to severe acne
Skin-Care Practices	6	Face washing should be performed at least twice daily

Data Analysis

Data were analyzed using SPSS version 28.0. Demographic data and scores related to knowledge were subjected to descriptive statistics such as means, standard deviations, frequencies, and percentages. For the primary analysis, paired samples t-tests were used because it was a parametric test and repeated measures was applied on the same participant with a normal distribution of the scores (Ruhela et al., 2025). Normality was checked using the Shapiro-Wilk test and the scores of the knowledge were normally distributed at the pre-test and post-test ($p > 0.05$). The observed changes were found to be of practical significance using Cohen's *d* with values of 0.2, 0.5 and 0.8 as small, medium and large effects respectively. Subgroup analyses were carried out for individual faculties to explore overall changes in knowledge at faculty level. A *p* value of less than 0.05 was deemed as significant. The tests performed were two-tailed tests.

RESULTS AND DISCUSSION

In this community service activity, 30 students from universities participated, which included 18 males (60.0%) and 12 females (40.0%). The mean age of participants was 20.8 years (*SD* = 1.9, range 18-24). By faculty, 16 participants (53.3%) were from Medical Sciences, 8 (26.7%) from Science, and 6 (20.0%) from Arts. Most participants (73.3%) currently had acne, 16.7% had had acne in the past, and 10.0% had no history of acne. The current high prevalence of acne among the participants was in line with the earlier epidemiological studies which indicated that acne is prevalent in most university students. The mean knowledge score for all participants at pre-test was 59.0% (*SD* = 12.4) indicating a voluntary nature of participation and possible higher level of health related interest among this sub group.

After four weeks of intervention, the mean knowledge score was 70.0% (*SD* = 10.8). This was a 11 percentage point improvement which was statistically significant ($t(29) = 6.42$, $p < 0.001$) and had a large effect size (Cohen's *d* = 0.96). With a baseline knowledge score of 59.0%, there was significant pre-existing knowledge deficits, similar to previous studies that reported poor acne knowledge among university students in various settings. The improvement in this activity is similar to that reported in previous education interventions such as infographic-based interventions where similar improvements in knowledge were reported. The results

showed that there is a big effect size, indicating that the multi-component and experiential learning method is effective to generate increase of knowledge (Knowles et al., 2022). The decrease in standard deviation between pre-test and post-test also suggests that the intervention decreased knowledge gaps among participants, with lower performing participants moving closer to the group mean. The study result backs the theoretical basis that structured educational interventions are effective in overcoming gaps in dermatological health knowledge.

Table 2. Participant Characteristics of the Study Participants

Characteristics	Frequency (n)	Percentage (%)
Age (Years)		
Mean (SD)	20.8 (1.9)	
Range	18-21	
Sex		
Male	18	60.0
Female	12	40.0
Faculty		
Medical Sciences	16	53.3
Science	8	26.7
Arts	6	20.0
Year of Study		
First year	8	26.7
Second year	11	36.7
Third year	7	23.3
Fourth year	4	13.3
Self-reported acne		
Yes, current	22	73.3
Yes, past	5	16.7
No	3	10.0

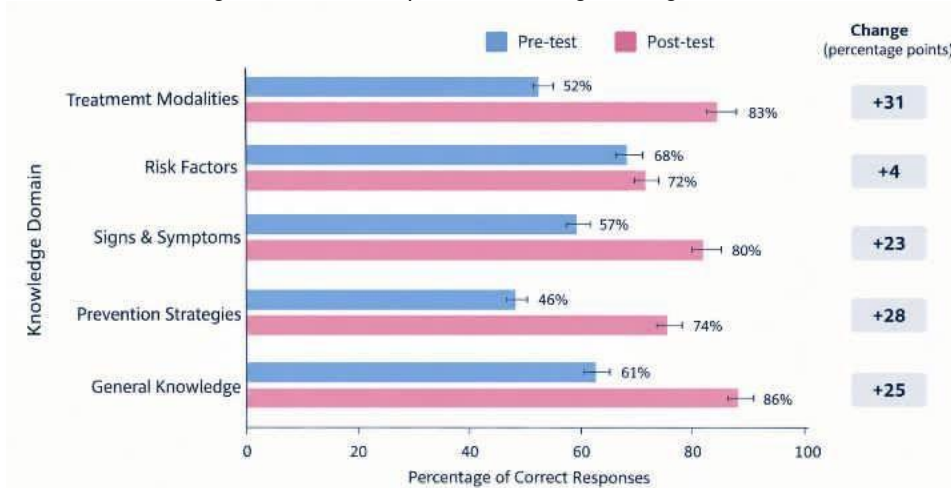
This community service activity showed that a community-based educational intervention in the form of a structured intervention can have a significant impact on acne related knowledge among university students across a variety of academic disciplines. This increase of 11 percentage points (pre-test 59.0% to posttest 70.0%) was a large effect (Cohen's $d = 0.96$) and was statistically significant ($p < 0.001$).

Table 3. Description of Participants' Knowledge Before and After the Intervention

Item	Before N (%)	After N (%)
Etiology and Pathogenesis		
Correct responses	112 (62.2)	129 (71.7)
Risk Factors		
Correct responses	123 (68.3)	131 (72.8)
Treatment Modalities		
Correct responses	102 (48.6)	141 (67.1)
Skin-Care Practices		
Correct responses	99 (55.0)	124 (68.9)

Importantly, the improvements were seen across all faculty subgroups as well as by gender, indicating that the intervention was effective for students with both high and low baseline knowledge levels and across both male and female. The results indicated that community service health education programs can improve skin-care knowledge gaps and encourage people to make informed decisions about their skin-care among university students (Stauber, Razavi, Sarris, Harlan, & Monlezun, 2022).

Figure 2. Domain-Specific Knowledge Changes from Pre- to Post-Intervention



Knowledge change measured in this activity is similar to other educational interventions for acne. In Thailand, an intervention using an infographic had the proportion of students with high knowledge increase from 25.8% to 68.1%. It is difficult to compare results directly due in part to the different measures used to assess outcome, but both studies show that structured educational interventions can result in significant knowledge gains. The present activity builds upon the existing literature by providing evidence of effectiveness in a variety of academic fields and by providing a community service structure that could improve engagement and sustainability. The amount of improvement across the different knowledge domains varies significantly, and should be considered when reviewing the results: significant improvements were observed in the Treatment Modalities domain, whereas only minimal improvements were observed in the Risk Factors domain.

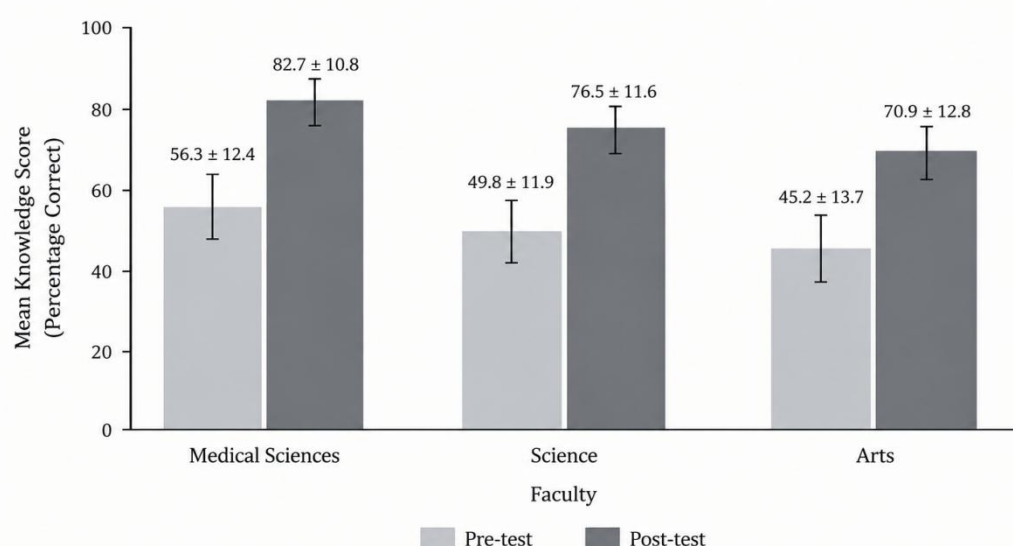
Table 4. Effectiveness of the Intervention on Knowledge Before and After

Variable	Mean	Standard Deviation	P-value
Before Intervention	59.0	12.4	<0.001
After Intervention	70.0	10.8	

In all three faculties, there were significant gains in knowledge between pre- and post-test scores. Medical Sciences students increased from 64.3% to 74.1% (mean difference = 9.8 percentage points, $p < 0.001$). The mean difference for science students was 11.8 percentage points, with the science students improving from 56.5% to 68.3% ($p = 0.006$). The relative gains for the arts students were the highest, with an increase from 51.2% to 65.8% (mean difference = 14.6 percentage points, $p = 0.019$). The results found in the faculty indicate significant trends in baseline knowledge and intervention responsiveness. Medical Sciences students had the highest pre test scores compared to the other groups which could be due to the basic biomedical curriculum they received in school that had some dermatology topics covered. However, even with this strength, they showed statistically significant improvement, suggesting that there is significant knowledge gaps that need to be addressed through specific educational intervention even for students with health-related academic background (Alshehri, Alosaimi, Rufaidi, Alsomali, & Tumala, 2021). This result is consistent with previous studies reporting inadequate acne knowledge in health related college students, which highlights a

lack of formal medical curricula as a means of practical dermatological education. Science students were in the middle, between Medical Sciences and Arts students in their pre-test scores. This improvement of 11.8 percentage points indicates an effective intervention for students who already had a good scientific knowledge, but not much dermatological experience. This is an important improvement in this group, showing that the intervention effectively closed the general science-specific dermatology knowledge gap. Arts students gained the most percentage points (14.6) but started the year with the lowest baseline knowledge scores. This is especially significant because this finding indicates that they were most effective at the level of participants who had the highest preexisting lack of knowledge. Responsiveness of Arts students may well be related to their openness to experiential learning approaches which focus on discussion, reflection and application rather than didactic instruction. The pedagogic principle that was followed with this pattern was that interventions focused on the learners can adequately compensate for some knowledge gap in learners with different academic backgrounds. Convergence of the post-test scores: Medical Sciences, 74.1%, Science, 68.3%, Arts, 65.8%, showed that the intervention not only decreased, but also made an effort to erase the gaps in knowledge among the different faculties.

Figure 3. Pre- and Post-Intervention Acne Knowledge Scores by Faculty



The multi-component design provided interactive workshops, peer-led discussions, hands-on demonstrations, and home delivery of materials and covered several determinants of health behaviors identified in the theory. The discussion portion with peers could have contributed to the development of self-efficacy in a variety of ways, including: observational learning and social support, and the practical portion gave opportunities for mastery experiences. The community service system is also consistent with the concepts of experiential learning theory. Participants might have experienced that learning was more relevant and meaningful when contextualized in a service setting, rather than didactic learning (Oyelude, Weber, & Thesnaar, 2025). There are several implications of this activity for university health promotion programs. Community service interventions are both scalable and cost effective means of reaching university students with health education. Such programs can be implemented at a relatively high level of outreach using peer educators and existing student groups. Second, there is a good deal of evidence that the intervention is effective in a variety of academic disciplines, indicating that health education should not be restricted to

students from the health professions. Health promotion should be included in the community service program or as part of co-curricular programs for students across all faculties. Thirdly, the differential improvement in each domain of knowledge points to the need to target educational interventions to areas in which knowledge is most lacking. A number of limitations of this activity need to be recognized, consistent with previous studies that have identified misconceptions regarding acne treatment. First, the present single group, pre-test/post-test design with no control group reduces the capacity to only credit the intervention with improvements in knowledge. Moreover, the small number of students (N=30) reduce the power to observe small size effects and the generalizability of the findings. Third, the use of self-reported knowledge measurement, instead of observation and clinical outcomes, might restrict interpretation of the effect of the intervention on actual use of skin care. However, the activity has a number of strengths (Nazarnia, Zarei, & Roozbahani, 2023).

CONCLUSION

This community service activity showed that a structured educational intervention could have a high impact on the knowledge of University students with regard to Acne in different fields of study. This is a statistically significant ($p < 0.001$) large effect size with knowledge scores increasing from 59.0% to 70.0%. Enhancements were noted for all faculty subgroups and by both gender groups, especially Arts students. The results indicated that it was possible to integrate health education into community service activities in universities and that it could be used to overcome knowledge gaps while at the same time allowing students to participate in meaningful civic activities.

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None.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest between the authors.

ETHICAL CONSIDERATION

All ethical aspects of the activity were taken into consideration and the research was approved by the Institutional Review Board of the university. Before enrolling, all participants signed a written informed consent form. Participants were made aware that they could withdraw at any time without penalty. Participant data were anonymized by using unique participant codes and all materials were kept securely in password-protected files that were accessible only to the research team. Participants were informed their answers would not have any impact on their grades or on their relationship with the faculty. All participants, whether or not they completed the study, received educational materials, ensuring that everyone could gain access to health-related information.

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AUTHOR CONTRIBUTIONS

HF: Conceptualization and supervision, AA and KA: Initial writeup and data analysis, FB and

HN: Final drafting and proof reading.

STATEMENT ON THE USE OF ARTIFICIAL INTELLIGENCE

The authors declare that there was no use of artificial intelligence in the preparation of this manuscript.

CITATION MODEL

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