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**Original Article**

# Impact of Acne on the Quality of Life of Adolescents in the Territory of the Northern and Southern Regions of Montenegro

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**Abstract**

**Background:** Acne vulgaris is a chronic inflammatory disease predominantly known as a disease of adolescents. We aimed to assess the quality of life of adolescents with acne in the territory of northern and southern regions of Montenegro.

**Methods:** This cross-sectional study was conducted in 2024, in four secondary schools in the north and south of Montenegro with total number of 561 subjects. To assess the quality of life of adolescents with acne we used the Children's Dermatology Life Quality Index and to measure acne-related disability we used The Cardiff Acne Disability Index.

**Results:** The average value of the total CDLQI score among adolescents from the northern region of Montenegro was 4.45±3.31, and 4.03±3.50 among southern region. The average value of the total CADI score among adolescents from the northern region of Montenegro was 3.56±1.77, and 3.50±1.98 among adolescents from the southern region. A statistically significantly higher mean value of sub scores in adolescents from the northern region compared to adolescents from the southern region existed in the domain of symptoms and feelings, vacation and treatment ($P< 0.05$). The regression analysis was also performed.

**Conclusion:** This study confirms the negative impact of acne on the quality of life of Montenegrin adolescents, especially those in the northern region. It is necessary to give more attention to the acne problems from doctors, and to increase awareness among adolescents and provide them early and the most effective therapy.

**Keywords:** Acne; Quality of life; Adolescents; Montenegro

## Introduction

Acne vulgaris is a chronic inflammatory disease that is predominantly known as a disease of adolescents (1). Globally, incidence of acne vulgaris cases seems to be increasing significantly, from nearly 80 million in 1990 to 118 million in 2019, pointing out the importance of this skin condition (2). It is stated that countries with higher socioeconomic index have higher prevalence of this diseases, while, for instance, Central Europe have the lowest prevalence (3). Demographic factors are important predictor of acne presentation and therefore highest incidence are among teenagers and lowest among children before puberty (4). It affects 85% of adolescents worldwide (5).

The changes that occur on the physical and physiological level in this period are extremely significant for further development of adolescents as a person; they affect the emotional state, the formation of identity and social contacts (6).

Adolescents of both sexes often experience difficulties acne vulgaris than some other chronic dermatomes, or diseases of other organic systems, which objectively endanger the patient more. Researches shows at least 85% of adolescents have acne vulgaris, which can have significant negative effects on their personality, and that acne is precisely among diseases with the strongest impact on the patient's mental status (7).

The impact of acne vulgaris on the quality of life is more pronounced in severe clinical forms, with a similar effect in both sexes (8), while women with acne experience a greater impairment of quality of life compared to men, and that men have more severe clinical forms of acne (9). In contrast to most other dermatological diseases that can be limited to areas covered by clothing, acne vulgaris is most often visible on the face and chest. In addition, acne requires long-term treatment, without quickly visible results, which can be an additional source of frustration and dissatisfaction. Individual and social perception in adolescents will cause a feeling of difference, which can further lead to anxiety, fear and guilt. Patients with acne show significantly worse self-image and lower self-esteem and inhibition in social interactions (10).

Although acne vulgaris is a medical condition that rarely has significant physical health consequences, it can nevertheless represent a serious medical problem due to its negative effect on the psychological health, psychological well-being and quality of life of people with acne (11).

We aimed to assess the quality of life of adolescents with acne in the territory of northern and southern regions of Montenegro.

## Material and Methods

The conducted survey included 561 respondents, namely 322 (57.4%) respondents from the northern region of Montenegro and 239 (42.6%) respondents from the southern region of Montenegro. This cross-sectional study was conducted in four secondary schools in the north and south of Montenegro, selected by the random sampling method. The selection of the sample involved the stratification of the cities in the north and south of Montenegro in 2024, and then of the schools, in order to select four in the northern and four in the southern region of Montenegro. The respondents were all-first and second grade high school students. Participation was voluntary and anonymous.

As a research instrument, a specially created questionnaire for research purposes was used, which was previously used in research conducted among adolescents from the central region of Montenegro. The first part of the questionnaire related to demographic data (gender and age) and the second related to issues related to acne (presence of acne, its duration and localization, visits to health care providers, presence of other coexisting skin diseases and family history, methods of acne treatment) as well as questions related to perceived factors that aggravate or cause acne (15 questions), factors that alleviate acne (8 questions), and sources of information about acne (7 questions). Answers to all questions, except questions about age and gender, are designed as "yes" and "no".

To assess the quality of life of adolescents with acne, the Children's Dermatology Life Quality Index (CDLQI) was used, composed of 10 items, which covers all aspects of quality of life: symptoms and feelings (items 1 and 2), free time (items 4, 5 and 6), school or vacation (item 7), personal relationships (items 3 and 8), sleep (item 9) and treatment (item 10) in the previous week.

The Cardiff Acne Disability Index (CADI) is a brief acne-specific questionnaire designed to measure acne-related disability. It consists of five questions relating to the previous months covering feelings, symptoms, social life and perceived severity. Each question has four possible answer categories (0–3) with a total maximum score of 15. A higher score means that the quality of life is more impaired.

Data processing utilized SPSS 23.0 (IBM Corp., Armonk, NY, USA). Testing the differences in the mean values of the corresponding scores and sub scores of the quality of life between the adolescents of the northern and southern regions of Montenegro was performed using the t test, while the correlations of the quality of life index with the sub scores and the total score of disability caused by acne in the northern and southern regions of Montenegro were determined using Bivariate correlation test and determining the Spearman coefficient. The regression analysis was also performed.

The survey was conducted after receiving consent from the Ministry of Health, the Ministry of Education and the director of selected schools with the written informed consent of the student's parents. The study was approved by the Ethics Committee of the Faculty of Medicine of the University of Montenegro (No.259/3; 16.02.2024).

## Results

The conducted survey included 561 respondents, namely 322 (57.4%) respondents from the northern part of Montenegro and 239 (42.6%) respondents from the southern part of Montenegro. Regarding gender, there were 194 (34.6%) boys and 367 (65.4%) girls. Observed in relation to the region, the research included 97 (30.1%) boys and 225 (69.9%) girls from the northern region of Montenegro, i.e. 97 (40.6%) boys and 142 (59.4%) girls from the southern region of Montenegro. The average age of the subjects of the complete study population was 15.97 ± 0.79 years (min 14 years, max 20 years). In relation to the region, Mann Whitney test established a statistically significant difference in the average age of the respondents and individual characteristics of participants according to the region, sex and age could be seen in Table 1.

**Table 1:** Socio demographic characteristics of respondents according to the regions of Montenegro

| *Variable* | *Southern* | *Northern* | *P value* |
|---|---|---|---|
| Average age of all respondents | | | |
| Mean | 16.09 | 15.87 | 0.005* |
| Standard Deviation | 0.81 | 0.76 | |
| Min | 15 | 14 | |
| Max | 20 | 18 | |
| Average age by sex | | | |
| Male | 15.87 | 15.89 | |
| Female | 16.16 | 15.87 | |

*Mann Whitney test

Out of 561 respondents, the presence of acne was confirmed by 219 (39%) of them, namely 121 (37.6%) adolescents from the northern region of Montenegro and 98 (41%) from the southern region of Montenegro have acne. Observed in relation to gender, the frequency of acne was significantly higher in girls in the northern region of Montenegro (29.9% of boys versus 41% of girls), (P < 0,001), while in the southern region of Montenegro the ratio was in favor of boys (46.4% of boys and 37.3% of girls), but without a statistically significant difference (*P* = 0.419).

The mean values of the total score and the corresponding sub scores for CDLQI and CADI for the study population from the northern and southern regions of Montenegro are shown in Table 1. A significantly higher mean value of sub scores in adolescents from the northern region compared to adolescents from the southern region existed in the domain of symptoms and feelings, vacation and treatment (p < 0.05). No significant differences were found in the average values of disability index between the two groups of adolescents with acne (Table 2).

**Table 2:** Differences in the average values of CDLQI and CADI scores and subscores between the northern and southern regions of Montenegro

| *Variable* | *Northern region* | *Southern region* | *P** |
|---|---|---|---|
| CDLQI | | | |
| Symptoms and Feelings (Items 1 and 2) | 1.47 ± 1.26 | 1.15 ± 1.42 | 0.018 |
| Personal Relationships (Items 3 and 8) | 0.77 ± 1.01 | 0.85 ± 1.08 | 0.734 |
| Free time (items 4.5 i 6) | 1.35 ± 1.49 | 1.34 ± 1.32 | 0.754 |
| School/Vacation (item 7) | 0.28 ± 0.61 / | 0.35 ± 0.69/ | 0.524 |
| | 0.45 ± 0.69 | 0.29 ± 0.69 | 0.015 |
| Sleep (item 9) | 0.17 ± 0.63 | 0.09 ± 0.48 | 0.213 |
| Treatment (item 10) | 0.38 ± 0.64 | 0.24 ± 0.56 | 0.039 |
| Total CDLQI score | 4.45 ± 3.31 | 4.03 ± 3.50 | 0.145 |
| CADI | | | |
| Symptoms and Feelings (CADI1) | 0.78 ± 0.82 | 0.88 ± 0.74 | 0.206 |
| Personal Relationships (CADI2) | 0.63 ± 0.66 | 0.52 ± 0.70 | 0.113 |
| Avoiding Swimming (CADI3) | 0.25 ± 0.56 | 0.36 ± 0.68 | 0.183 |
| Feelings about Skin Outflow (CADI4) | 1.02 ± 0.69 | 0.90 ± 0.60 | 0.215 |
| Perceived Severity (CADI4) | 0.87 ± 0.56 | 0.85 ± 0.66 | 0.641 |
| Total CADI score | 3.56 ± 1.77 | 3.50 ± 1.98 | 0.704 |

*$t$ test

Analysis of gender differences showed that girls from the northern region have a statistically significantly higher average CDLQI sub score related to feelings (expression of symptoms and emotions), as well as a statistically significantly higher CADI4 sub score (more detailed feelings about the appearance of the skin) compared to boys ($p < 0.05$). No significant difference was shown in the mean values of the total CDLQ and the total CADI score between boys and girls in the northern region of Montenegro (Table 3).

**Table 3:** Differences between boys and girls in the northern region of Montenegro in the average values of the CDLQI and CADI scores and sub scores

| *CDLQI* | *Mean ± SD* | | *P** |
|---|---|---|---|
| | *Boys* | *Girls* | |
| Symptoms and Feelings (Items 1 and 2) | 1.07 ± 0.99 | 1.60 ± 1.32 | 0.046 |
| Personal Relationships (Items 3 and 8) | 0.76 ± 0.98 | 0.78 ± 1.02 | 0.900 |
| Free time (items 4.5 i 6) | 1.21 ± 1.14 | 1.40 ± 1.59 | 0.844 |
| School/Vacation (item 7) | 0.24 ± 0.70/ | 0.30 ± 0.59/ | 0.264/ |
| | 0.48 ± 0.74 | 0.45 ± 0.68 | 0.812 |
| Sleep (item 9) | 0.10 ± 0.55 | 0.20 ± 0.65 | 0.300 |
| Treatment (item 10) | 0.45 ± 0.74 | 0.37 ± 0.61 | 0.713 |
| Total CDLQI score | 3.83 ± 2.49 | 4.65 ± 3.52 | 0.337 |
| CADI | | | |
| Symptoms and Feelings (CADI1) | 0.62 ± 0.62 | 0.84 ± 0.88 | 0.355 |
| Personal Relationships (CADI2) | 0.76 ± 0.64 | 0.59 ± 0.66 | 0.187 |
| Avoiding Swimming (CADI3) | 0.24 ± 0.51 | 0.25 ± 0.58 | 0.841 |
| Feelings about Skin Outflow (CADI4) | 0.79 ± 0.49 | 1.09 ± 0.73 | 0.037 |
| Perceived Severity (CADI4) | 1.00 ± 0.38 | 0.83 ± 0.60 | 0.063 |
| Total CADI score | 3.41 ± 1.27 | 3.61 ± 1.90 | 0.948 |

*$t$ test

The analysis of gender differences in the southern region of Montenegro did not show statistically significant differences in the average scores and sub scores of quality of life and disability caused by acne between boys and girls in the southern region (Table 4).

**Table 4:** Differences between boys and girls in the southern region of Montenegro in the average values of CDLQI and CADI scores and sub scores

| ***CDLQI*** | ***Mean ± SD*** | | ***P**** |
|---|---|---|---|
| | **Boys** | **Girls** | |
| Symptoms and Feelings (Items 1 and 2) | 1.13 ± 1.45 | 0.17 ± 1.41 | 0.746 |
| Personal Relationships (Items 3 and 8) | 0.88 ± 1.09 | 0.81 ± 1.07 | 0.681 |
| Free time (items 4.5 i 6) | 1.20 ± 1.32 | 1.45 ± 1.31 | 0.168 |
| School/Vacation (item 7) | 0.40 ± 0.75 | 0.32 ± 0.64/ | 0.715 |
| | 0.40 ± 0.81 | 0.21 ± 0.57 | 0.214 |
| Sleep (item 9) | 0.08 ± 0.47 | 0.09 ± 0.49 | 0.876 |
| Treatment (item 10) | 0.24 ± 0.61 | 0.24 ± 0.52 | 0.744 |
| Total CDLQI score | 3.95 ± 3.62 | 4.09 ± 3.43 | 0.640 |
| | | | |
| CADI | | | |
| Symptoms and Feelings (CADI1) | 0.91 ± 0.70 | 0.85 ± 0.77 | 0.611 |
| Personal Relationships (CADI2) | 0.44 ± 0.62 | 0.58 ± 0.74 | 0.389 |
| Avoiding Swimming (CADI3) | 0.33 ± 0.60 | 0.38 ± 0.73 | 0.978 |
| Feelings about Skin Outflow (CADI4) | 0.98 ± 0.58 | 0.83 ± 0.61 | 0.245 |
| Perceived Severity (CADI4) | 0.97 ± 0.69 | 0.74 ± 0.62 | 0.092 |
| Total CADI score | 3.64 ± 1.82 | 3.37 ± 2.12 | 0.387 |

*t test

Table 5 shows the correlations of the quality-of-life index with sub scores and the total score of disability caused by acne in the northern and southern regions of Montenegro obtained by applying the Bivariate correlation test and determining the Spearman coefficient.

**Table 5:** Correlation relationships of the CDLQI index with the CADI index among adolescents in the northern and southern regions of Montenegro

| ***Bivariate correlation test*** | ***Northern region*** | ***Southern region*** |
|---|---|---|
| | CDLQI | |
| CADI1 | r=0.280. *P*=0.002* | r=0.436. *P*<0.001* |
| CADI2 | r=0.126. *P*=0.167 | r=0.108. *P*=0.664 |
| CADI3 | r=0.100. *P*=0.277 | r=0.212. *P*=0.036* |
| CADI4 | r=0.386. *P*<0.001* | r=0.274. *P*=0.006* |
| CADI5 | r=0.202. *P*=0.026* | r=0.162. *P*=0.597 |
| Total CADI | r=0.311. *P*=0.001* | r=0.274. *P*<0.001* |

* Statistically significant correlation

There was no statistically significant predictive value of the analyzed independent variables on CDLQI and CADI scores among adolescents in the northern and southern region of Montenegro, which can be seen in Tables 6 and 7.

**Table 6:** Predictive significance of characteristics of adolescents with acne from the northern region of Montenegro on quality of life and disability index

| *Variable* | *B* | *95%CI* | *P* |
|---|---|---|---|
| CDLQ | | | |
| Sex | 0.695 | -0.897–2.288 | 0.389 |
| Duration of disease | 0.457 | -1.091–2.004 | 0.560 |
| Localization of acne | 0.046 | -0.631–0.722 | 0.894 |
| Treatment of acne | 0.236 | -1.173–1.645 | 0.740 |
| Other skin diseases | -1.663 | -4.836–1.510 | 0.301 |
| Family history | -0.036 | -1.348–1.276 | 0.956 |
| | | | |
| CADI | | | |
| Sex | 0.262 | -0.586–1.110 | 0.541 |
| Duration of disease | 0.512 | -0.313–1.336 | 0.221 |
| Localization of acne | -0.029 | -0.389–0.332 | 0.875 |
| Treatment of acne | -0.532 | -1.283–0.218 | 0.163 |
| Other skin diseases | -1.103 | -2.793–0.587 | 0.199 |
| Family history | -0.102 | -0.801–0.597 | 0.772 |

B- unstandardized coeficient. CI-confidence interval

**Table 7:** Predictive significance of characteristics of adolescents with acne from the southern region of Montenegro on quality of life and disability index

| | *B* | *95%CI* | *P* |
|---|---|---|---|
| CDLQ | | | |
| Sex | 0.350 | -1.242–1.943 | 0.663 |
| Duration of disease | -0.379 | -2.278–1.521 | 0.693 |
| Localization of acne | -0.047 | -0.855–0.761 | 0.908 |
| Treatment of acne | 0.388 | -1.089–1.864 | 0.603 |
| Other skin diseases | 0.226 | -2.021–2.474 | 0.842 |
| Family history | 0.224 | -1.230–1.677 | 0.761 |
| | | | |
| CADI | | | |
| Sex | -0.514 | -1.413–0.385 | 0.259 |
| Duration of disease | 0.370 | -0.698–1.438 | 0.493 |
| Localization of acne | -0.302 | -0.767–0.163 | 0.201 |
| Treatment of acne | 0.465 | -0.395–1.324 | 0.286 |
| Other skin diseases | 0.413 | -0.853–1.678 | 0.519 |
| Family history | 0.184 | -0.632–1.001 | 0.655 |

B-unstandardized coeficient. CI-confidence interval

## Discussion

The acne is main skin problem affecting the adolescents in more than 85% and there is established pattern of them continuing later in the life of adolescent, causing lower quality of their lie and self-esteem (12). The most affected region of acne appearance is frontal region of the face – the most noticeable region, which can rarely be hidden (13). Appearance of adolescent is the most important, where they feel „obligated "to look good, have good skin and not be different one from another (14). Different type of diets in both girls and boys, especially high-protein diets in boys, are connected to the sebum production and can favor the acne appearance (15, 16). Of course, there is hormonal change, on which adolescents cannot do anything to prevent (17). Self-reported acne was presented in 49.8% of Podgorica, Montenegro pupils (18). In our research conducted in northern and southern regions of Montenegro, among all adolescents involved in study, 39% of them had acne problems.

Health professionals often underestimate the acne, but there is much evidence that they have significant impact on the social and psychological aspects of adolescents (19). The severity of effect is connected to the level of the impact of acne on the quality of the life and there is evidence that it could also lead to the different levels of depression depending of the individual (20). Depression, sadness, anxiety, anger, and frustration are some of the most common feeling in adolescents, especially among ones that have not had success in treatments with dermatologist (21). In study among teenagers, the first thing that was noticed in the persons with acne, considering their entire appearance, was skin (22).

Several studies described that acne vulgaris have large impact on the quality of life in adolescents (23, 24).

Overall in similar study conducted in Montenegro, the CDLQI domains that were most affected by acne were symptoms and feelings, leisure, and treatment (18). Similar results were found in our present study among southern and northern region of Montenegro where adolescents from northern and southern region of Montenegro were affected in the domain of symptoms and feelings, school/vacation and treatment. No statistically significant differences were found, between boys and girls, neither in total CDLQI scores, nor in CDLQI domain scores in same study (18). We had the same results, but when we observed boys and girls in different regions, the ones from northern region had significant difference in symptoms and feeling in CDLQI and feelings about Skin Outflow in CADI, while that difference was not found in the southern region.

Compared depression and anxiety, the anxiety was more common among adolescents with acne (25). Both, adolescents and adults experienced psychological impact related specifically to acne as assessed by the acne specific CADI scale (26). The mean total CADI score was higher in girls (4.07 ± 3.11) than in boys (2.90 ± 3.00) (18). CADI scores differed on the region of Montenegro, where in southern it was higher among boys (3.64 ± 1.82) and in northern was higher among girls (3.61 ± 1.90).

Adolescents and adults who were more educated had more psychological impairment considering acne, and this was present in females (27). Rural place of living affected the quality of life in patients with acne (28). In our research, acne in the adolescents from northern region of Montenegro had significant impact on various aspects of CDLQI in comparison with southern where there was no significance was found.

There was described strong correlation between the CDLQI and CADI in study of acne in Montenegro population (18), and this is in the line with our research between different regions.

In summary, the psychological impact of acne must be revisited in light of the codes by which adolescents of the 21st century live their lives. This is a generation that, more than any other invites us to revisit child–adult relationships, and especially teenager–doctor relationships; they have grown up in an attractive but complicated society that places a high value on appearance. Most dermatologists have intuitively managed to adapt to a generation that can at times be impa-

tient, demanding, and egocentric and connected, but a greater level of understanding of the motivations of these adolescents and the factors affecting their psychological well-being will further help to address treatment adherence and success. Perhaps more than the generations that have come before them, the current generation of adolescents need help to recognize and deal with the psychological impact of acne in their lives.

## Conclusion

This study confirms the negative impact of acne on the quality of life of Montenegrin adolescents, especially the adolescents living in the northern region. This study also has shown a strong correlation between the CDLQI and CADI. It is necessary to give more attention to the acne problems, especially by the doctors, because it causes the psychological problems that affect lives of adolescents on the different levels. In addition, it is crucial to increase awareness among adolescents and provide them early and the most effective therapy.

## Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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## Conflict of Interest

The authors declare that there is no conflict of interests.

## References

1. Chen H, Zhang TC, Yin XL, Man JY, Yang XR, Lu M (2022). Magnitude and temporal trend of acne vulgaris burden in 204 countries and territories from 1990 to 2019: an analysis from the Global Burden of Disease Study 2019. *Br J Dermatol*, 186 (4): 673-683. doi: 10.1111/bjd.20882.
2. Layton AM, Thiboutot D, Tan J (2021). Reviewing the global burden of acne: how could we improve care to reduce the burden? *Br J Dermatol*, 184 (2): 219-225. doi: 10.1111/bjd.19477.
3. Alshammrie FF, Alshammari R, Alharbi RM, Khan FH, Alshammari SK (2020). Epidemiology of Acne Vulgaris and Its Association with Lifestyle Among Adolescents and Young Adults in Hail, Kingdom of Saudi Arabia: A Community-Based Study. *Cureus*, 12 (7): e9277. doi: 10.7759/cureus.9277.
4. Bhate K, Williams HC (2013). Epidemiology of acne vulgaris. *Br J Dermatol*, 168 (3): 474-85. doi: 10.1111/bjd.12149.
5. Lynn DD, Umari T, Dunnick CA, Dellavalle RP (2016). The epidemiology of acne vulgaris in late adolescence. *Adolesc Health Med Ther*, 7: 13-25. doi: 10.2147/AHMT.S55832.
6. Zhou C, Vempati A, Tam C, et al (2023). Beyond the Surface: A Deeper Look at the Psychosocial Impacts of Acne Scarring. *Clin Cosmet Investig Dermatol,* 16: 731-738. doi: 10.2147/CCID.S406235.
7. Vasam M, Korutla S, Bohara RA (2023). Acne vulgaris: A review of the pathophysiology, treatment, and recent nanotechnology based advances. *Biochem Biophys Rep*, 36: 101578. doi: 10.1016/j.bbrep.2023.101578.
8. Kaikati J, Zoghaib S, Kechichian E, et al (2021). The impact of acne treatment on quality of life and self-esteem: A prospective cohort study from Lebanon. *Int J Womens Dermatol*, 7 (4): 415-421. doi: 10.1016/j.ijwd.2021.03.005.
9. Jones-Caballero M, Chren MM, Soler B, Pedrosa E, Peñas PF (2007). Quality of life in mild to moderate acne: relationship to clinical severity and factors influencing change with treatment. *J Eur Acad Dermatol Venereol*, 21 (2): 219-26. doi: 10.1111/j.1468-3083.2006.01907.x.
10. Gallitano SM, Berson DS (2017). How Acne Bumps Cause the Blues: The Influence of Acne Vulgaris on Self-Esteem. *Int J Womens Dermatol*, 4 (1): 12-17. doi: 10.1016/j.ijwd.2017.10.004.

11. Dunn LK, O'Neill JL, Feldman SR (2011). Acne in adolescents: quality of life, self-esteem, mood, and psychological disorders. *Dermatol Online J*, 17 (1): 1.
12. Mooney T (2014). Preventing psychological distress in patients with acne. *Nurs Stand*, 28 (22): 42-8. doi: 10.7748/ns2014.01.28.22.42.e8166.
13. Duquia RP, de Almeida HL Jr, Breunig JA, Souzat PR, Göellner CD (2013). Most common patterns of acne in male adolescents: a population-based study. *Int J Dermatol*, 52 (5): 550-3. doi: 10.1111/j.1365-4632.2011.05333.x.
14. Pfeifer JH, Berkman ET (2018). The Development of Self and Identity in Adolescence: Neural Evidence and Implications for a Value-Based Choice Perspective on Motivated Behavior. *Child Dev Perspect*, 12 (3): 158-164. doi: 10.1111/cdep.12279.
15. Merkiel-Pawłowska S, Chalcarz W (2017). Gender differences and typical nutrition concerns of the diets of preschool children - the results of the first stage of an intervention study. *BMC Pediatr*, 17 (1): 207. doi: 10.1186/s12887-017-0962-1.
16. Quann EE, Fulgoni VL 3rd, Auestad N (2015). Consuming the daily recommended amounts of dairy products would reduce the prevalence of inadequate micronutrient intakes in the United States: diet modeling study based on NHANES 2007-2010. *Nutr J*, 14: 90. doi: 10.1186/s12937-015-0057-5.
17. Borzyszkowska D, Niedzielska M, Kozłowski M, et al (2022). Evaluation of Hormonal Factors in Acne Vulgaris and the Course of Acne Vulgaris Treatment with Contraceptive-Based Therapies in Young Adult Women. *Cells*, 11 (24): 4078. doi: 10.3390/cells11244078.
18. Đurović MR, Đurović M, Janković J, Janković S (2021). Quality of life in Montenegrin pupils with acne. *PLoS One*, 16 (4): e0250155. doi: 10.1371/journal.pone.0250155.
19. Kurokawa I, Nakase K (2020). Recent advances in understanding and managing acne. *F1000Res,* 9: F1000 Faculty Rev-792. doi: 10.12688/f1000research.25588.1.
20. Tasneem T, Begum A, Chowdhury MRK, et al (2023). Effects of acne severity and acne-related quality of life on depressive symptoms among adolescents and young adults: a cross-sectional study in Bangladesh. *Front Psychol*, 14: 1153101. doi: 10.3389/fpsyg.2023.1153101.
21. Dréno B (2006). Assessing quality of life in patients with acne vulgaris: implications for treatment. *Am J Clin Dermatol*, 7 (2): 99-106. doi: 10.2165/00128071-200607020-00003.
22. Ritvo E, Del Rosso JQ, Stillman MA, La Riche C (2011). Psychosocial judgements and perceptions of adolescents with acne vulgaris: A blinded, controlled comparison of adult and peer evaluations. *Biopsychosoc Med*, 5 (1): 11. doi: 10.1186/1751-0759-5-11.
23. Durai PC, Nair DG (2015). Acne vulgaris and quality of life among young adults in South India. *Indian J Dermatol*, 60 (1): 33-40. doi: 10.4103/0019-5154.147784.
24. Sagaltici E, Tas B (2021). Mental health and psychological resilience among acne vulgaris patients during the pandemic: A cross-sectional controlled study. *J Cosmet Dermatol*, 20 (12): 3739-3746. doi: 10.1111/jocd.14531.
25. Özkesici Kurt B (2022). Comparison of the psychosocial impact of acne in adolescents and adults; body satisfaction, self-esteem, and quality of life. *J Cosmet Dermatol*, 21 (2): 836-843. doi: 10.1111/jocd.14151.
26. Sharma R, Dogra N, Arora M (2023). Psychosocial impact of acne vulgaris on the quality of life among adolescents versus adults. *Clin Med (Lond)*, 23 (6): 35. doi: 10.7861/clinmed.23-6-s35.
27. Khan AS, Almulhim AF, Alqattan MH, et al (2022). Psychological Impact of Acne Vulgaris among Young Females in the Eastern Province, Saudi Arabia. *Cureus*, 14 (9): e29378. doi: 10.7759/cureus.29378. .
28. Martínez-García E, Arias-Santiago S, Herrera-Acosta E, Affleck A, Herrera-Ceballos E, Buendía-Eisman A (2020). Quality of Life of Cohabitants of People Living with Acne. *Acta Derm Venereol*, 100 (17): 5884. doi: 10.2340/00015555-3636.