



ORIGINAL RESEARCH

THE IMPACT OF ACNE VULGARIS ON THE QUALITY OF LIFE IN TEEN PATIENTS

Dampak Acne Vulgaris Terhadap Kualitas Hidup Pasien Remaja

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ABSTRACT

Background: Acne vulgaris (AV) is one of the most common cutaneous diseases in teenagers, which causes a decrease in self-esteem. Low self-esteem can affect the quality of life in AV patients.

Purpose: This research aims to analyze the impact of AV on the quality of life in teenage patients based on their age, education level, and AV severity.

Methods: This research used a non-probability purposive sampling technique and an observational analytic method with a cross-sectional design. The research location was SMPN 18 and SMAN 3 Surabaya. This study was conducted from August 2019 until January 2020. The samples were 109 teenagers; the total population was 2,121 teenagers. Research variables are AV severity and AV patients' quality of life. Research instruments were Lehmann's Grading System for evaluating AV severity and Dermatology Life Quality Index (DLQI) in teenage AV patients. Data obtained was analyzed with the fisher-exact test method. **Results:** There were 46 (42.20%) males and 63 (57.80%) females in this study. DLQI results showed that AV had an enormous impact on quality of life in 12.80% of cases among all subjects. AV has a great potential to precipitate anxiety and affect the quality of life without considering the severity of the disease. Correlation between quality of life and age; quality of life and education level; quality of life and AV severity level resulted in p values of 0.19; 0.08; and 0.59.

Conclusion: The management of AV in teenage patients should consist of individual treatment, education about AV, and its impact on the quality of life, as one of the critical social determinants of

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ABSTRAK

Latar Belakang: Acne vulgaris merupakan salah satu penyakit kulit yang paling sering terjadi pada remaja, yang menyebabkan penurunan kepercayaan diri dari pasien. Kepercayaan diri yang rendah dapat mempengaruhi kualitas hidup pasien AV. **Tujuan:** Penelitian ini bertujuan untuk menganalisis pengaruh AV terhadap kualitas hidup pasien usia remaja berdasarkan usia, tingkat pendidikan, dan tingkat keparahan AV. **Metode:** Penelitian ini menggunakan teknik non-probability purposive sampling dan metode observasional analitik dengan desain cross-sectional. Lokasi penelitian adalah SMPN 18 Surabaya dan SMAN 3 Surabaya. Penelitian ini dilakukan pada bulan Agustus 2019 hingga Januari 2020. Sampel penelitian adalah 109 remaja, dari total populasi 2,121 remaja. Variabel penelitian adalah keparahan AV dan kualitas hidup pasien. Instrumen penelitian berupa Lehmann's Grading System digunakan untuk mengevaluasi tingkat keparahan AV dan Dermatology Life Quality Index (DLQI) untuk mengevaluasi kualitas hidup pasien AV usia remaja. Analisis data menggunakan tes metode fisher-exac. **Hasil:** Penelitian pada 46 (42.20%) laki-laki dan 63 (57.80%) perempuan menunjukkan hasil bahwa AV berpengaruh besar terhadap kualitas hidup pada 12.80% kasus diantara semua subjek. AV berpotensi besar memicu munculnya kecemasan dan mempengaruhi kualitas hidup, tanpa mempertimbangkan tingkat keparahan penyakitnya. Hubungan antara kualitas hidup dan umur; antara kualitas hidup dan tingkat pendidikan; antara kualitas hidup dan tingkat keparahan AV didapatkan nilai p sebesar 0.19; 0.08; dan 0.59. **Kesimpulan:** Penatalaksanaan AV pada pasien usia remaja harus mencakup terapi individu, edukasi tentang AV, serta dampaknya terhadap kualitas hidup, sebagai salah satu determinan sosial kesehatan.

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INTRODUCTION

Acne vulgaris (AV) is a chronic inflammatory disorder of the pilosebaceous unit, presenting a pleomorphic array of lesions consisting of comedones, papule, pustule and nodule, with varying severity. It is a multifactorial and complex disease where a hereditary background, androgens, skin lipids, disorders of keratinization, inflammatory signalling, and regulatory neuropeptides seem to be mainly involved. It primarily affects the face and, less frequently, the chest or back. This chronic inflammatory disorder develops during the teen years and can continue into adulthood. AV is one of the most common cutaneous diseases in teenagers and young adults,

defined as the third most crucial disease by the global burden of disease. AV represents the top three most prevalent skin disorders in the population, as found in extensive studies in the UK, France, and the USA (Alshammrie et al., 2020; Jović et al., 2017; Kang et al., 2019; Lynn et al., 2016; Tan et al., 2021).

AV is a disease that affects the pilosebaceous unit in the skin. It is divided into 2 types, namely non-inflammatory (open and closed comedones) and inflammatory (papules and pustules). AV occurred based on the four main pathogenesis. The pathogenesis is follicular epidermal hyperproliferation; hyperactivity of the sebaceous gland; the presence and high activity of

Propionibacterium acnes; and inflammation (Kang et al., 2019; Lynn et al., 2016).

AV is affecting 9.40% of the population in the world, with the highest prevalence in the teenage population. The incidence of AV in males and females is over 90% and over 80% in all ethnic groups. AV may occur at any age, from birth (neonatal acne), between 1-12 months (infantile acne), and from a teenager into adulthood. AV may persist from a teenager into adulthood, or it can have its onset after the teenage period. The prevalence of AV in teenage is higher in males, but the prevalence of AV is higher in females in adulthood. The prevalence rate of AV is 64% in the 20s, 43% in the 30s; 1-7% in the 50s. AV appears to occur at an earlier age, because of the earlier age of adrenarche over the years. Okoro et al. mentioned that the prevalence of AV was 64.40% in Nigeria, with mild AV as the predominant case (Alanazi et al., 2018; Kang et al., 2019; Okoro et al., 2016).

Skin conditions negatively impact self-image and can cause feelings of isolation and loneliness. Additionally, physical discomfort adds to psychological distress (Dreno et al., 2021). AV has a significant psychological impact and comorbidity even though it is a frequent and non-threatening life condition (Stamu-O'Brien et al., 2021). AV may cause decreasing in patients' self-esteem and change the patients' social life due to the formation of frequent cicatricial, pustules, and abscesses (Kodra et al., 2018). Patients with clinically confirmed AV were more likely to have greater self-consciousness and self-perceived stress, lower self-esteem and self-worth, lower body dissatisfaction, lower self-attitude, and greater feelings of uselessness (Gallitano & Berson, 2018). The occurrence of anxiety, depression, and body dysmorphic disorders is also found to be higher among acne patients than that of the general population (Elsadek et al., 2021).

AV is often visible on the face, heightens body image and socialization problems. Therefore, it is not surprising that an individual with facial skin break out may develop a significant psychosocial inability (Tayel et al., 2020). AV impacts the person's appearance and influences his/her social and occupational life. In the teenage period, the patients do not have the maturity to face the psychological effect caused by AV. Considering all the negative impacts on AV patients' psychological and social life, AV has a great potential to affect the quality of life. Emotional well-being and function can be critical and

associated with depression (Duru & Örsal, 2021; Fabbrocini et al., 2018).

A study mentioned that 60% of teenage patients were found to have itchy sores and stinging skin, 66.70% were embarrassed by their acne-prone skin, and the social activity of 60% of the participants was affected by their active acne (Babar & Mobeen, 2019). Alanazi et al. (2018) mentioned that AV had a significant impact on quality of life in 14.50% of cases among all-female secondary school students in 3 randomly selected schools in Saudi Arabia. From the literature search included literature published about quality of life with acne, atopic dermatitis, scars (from any cause), and skin toxicities on PubMed between 2015 and 2020, patients with skin conditions have a much higher frequency of altered quality of life and psychological distress than those without (Alanazi et al., 2018; Dreno et al., 2021; Hosthota et al., 2016; Kang et al., 2019; Tasoula et al., 2012).

There were minimal data about the impact of AV on the quality of life in teenage patients. In contrast, data is needed to attract the attention of dermatologists to the psychosocial aspect of acne. It can even contribute as a first step for teenage patients to seek help for the AV they suffer. Treatment for AV patients may become necessary and will be needed to improve the general quality of life of patients with AV and other skin conditions. Impact of AV on the quality of life in patients, especially teenage patients becoming an essential topic of public health in medical practice (Chilicka et al., 2017). This research aims to analyze the impact of AV on the quality of life in teenage patients based on their age, education level, and AV severity level.

METHODS

This research was an analytic observational with a cross-sectional study aimed to analyze the impact of AV on the quality of life in teenage patients based on their age, education level, and AV severity level. The population of the study was 2,121 teenagers in Surabaya, Indonesia. Among them, teenage AV patients (10 - 18 years old) were selected from Junior High School and Senior High School (two public schools) in Surabaya, from August 2019 until January 2020. The sampling technique was non-probability-purposive sampling with $\alpha=0.05$ ($z=1.96$) and 109 total samples obtained. The inclusion criteria were 10 - 18 years-

old AV patients. The exclusion criteria were samples which were not willing to be respondents.

Research instruments were Lehmann's Grading System for evaluating the AV level severity and Dermatology Life Quality Index (DLQI) for assessing the quality of life in teenage AV patients (Perhimpunan Dokter Spesialis Kulit dan Kelamin Indonesia (PERDOSKI), 2017). Primary data taking was started by evaluating the AV severity scoring and DLQI. The data will be analyzed statistically using the fisher-exact test method.

Lehmann's Grading System has been used to classify and decide the severity of AV in clinical diagnostic. The severity was observed by evaluating the number of lesions on each side of the face. The severity of AV is divided into mild, moderate, and severe forms of AV. A mild form of AV has less than 20 opened or closed comedones on each side of the face. It has less than 15 inflammatory lesions (papule, pustule, nodule) on each side of the face or less than 30 total comedones and inflammatory lesions on each side.. A moderate form of AV has 20-100 opened or closed comedones on each side of the face or has 15-50 inflammatory lesions (papule, pustule, nodule) on each side of the face. It has 30-125 total comedones and inflammatory lesions on each side of the face or has five cyst lesions on each side of the face. A severe form of AV has more than 100 opened or closed comedones on each side of the face or has more than 50 inflammatory lesions (papule, pustule, nodule) on each side of the face. It has more than 125 total comedones and inflammatory lesions on each side of the face or has more than five cyst lesions on each side of the face (Kelompok Studi Dermatologi Kosmetik Indonesia, 2018; Perhimpunan Dokter Spesialis Kulit dan Kelamin Indonesia (PERDOSKI), 2017).

Dermatology Life Quality Index (DLQI) questionnaire consisted of 10 question items with six headings (symptoms and feelings, daily activities, leisure activities, work and school, personal relationship, and treatment). It was to measure a person's quality of life and determine how much a person's skin problems have affected their lives over the past week. The DLQI questionnaire will also be obtained which situations impact persons' life can be assessed in various levels of quality of life such as no effect, small effect, moderate effect, and significant effect.

Respondents should scored on how often they feel things based on the 10 question items. The

DLQI question items are spotless and easy to understand. DLQI is calculated by summing the scores for each question item, resulting in a maximum score of 30 and a minimum score of 0. A higher score means more quality of life is impaired. Test reliability and validity of the DLQI were checked (Marron et al., 2019). The ethical clearance was conducted by the Health Research Ethics Committee Universitas Airlangga School of Medicine Surabaya Indonesia, No. 314/EC/KEPK/FKUA/2019.

RESULTS

After inclusion and exclusion criteria, the research participants were 109 teenage patients consisting of 46 (42.20%) males and 63 (57.80%) females. DLQI results showed AV had an impact on the quality of life in 89 (81.70%) subjects. AV had small impact in 44 (40.40%) subjects; had moderate impact in 31 (28.40%) subjects; and had large impact in 14 (12.80%) subjects (Table 1).

The age of subjects in this study ranged from 12 to 17 years old; divided into ten people aged 12 years old, 25 people aged 13 years old, 18 people aged 14 years old, 36 people aged 15 years old, 19 people aged 16 years old, and one aged 17 years-old. In this study, there were 53 (48.60%) junior high school students and 56 (51.40%) senior high school students. The result of Lehmann's Grading System to evaluate the AV severity level in this study showed there were 60 subjects (55%) had a mild form of AV, 44 subjects (40.4%) had a moderate form of AV, and five subjects (4.6%) had a severe form of AV (Table 1).

Table 2 showed that the majority of subjects scored 0-1 on each question in the DLQI questionnaire. AV impacted the quality of life in 89 (81.70%) subjects. AV impacted the quality of life in 44 (83%) junior high school subjects; 16 suffered from a small impact on DLQI, 18 suffered from moderate impact, and ten suffered from a large impact DLQI. AV impacted quality of life in 45 (80.40%) senior high school subjects; 28 suffered from the small impact on DLQI, 13 suffered from moderate impact, and 4 suffered from a significant impact on DLQI. AV (Table 3).

AV had an impact on the quality of life of teenage. In the age category, among all 109 samples, AV affects the quality of life of 10 people aged 12 years old; 3 suffered from a small impact on DLQI, three suffered from a moderate impact on DLQI, and 2 suffered from a significant impact on DLQI. It also influences 25 people aged 13

years old; 8 suffered from a small impact on DLQI, 7 suffered from a moderate impact on DLQI, and 4 suffered from a significant impact on DLQI. Moreover, it affects 18 people aged 14 years old; 5 suffered from a small impact on DLQI, 8 suffered from a moderate impact on DLQI, and 4 suffered from a significant impact on DLQI. Then, it also affects 36 people aged 15 years old; 18 suffered from a small impact on DLQI, 6 suffered from moderate impact on DLQI, and 4 suffered from a significant impact on DLQI. The last, it affects 19 people aged 16 years old; 10 suffered from a small impact on DLQI and 7 suffered from a moderate impact on DLQI, and 1 person aged 17 years old suffered from a significant impact on DLQI (Table 3).

AV had impact on quality of life in 89 (81.70%) subjects. Mild AV impacted the quality of life in 51 (85%) subjects. Among all mild AV patients, 40% suffered from a small impact on DLQI, 33.30% suffered from moderate impact, and 11.70% suffered from a significant impact on DLQI. Moderate AV had impact on the quality of life in 35 (71.40%) subjects. Among all moderate AV patients, 40.90% suffered from a small impact on DLQI, 25% suffered from moderate impact, and 13.60% suffered on a significant impact on DLQI. Severe AV had impact on the quality of life in 3 (60%) subjects. Among all severe AV patients, 40% suffered from a small impact on DLQI, and 20% suffered from a significant impact on DLQI (Table 3).

Fisher-exact statistical analysis of the correlation between the quality of life and age resulted in a p-value of 0.19. Fisher-exact statistical analysis of the correlation between the quality of life and AV severity level resulted in a p-value of 0.59. These results showed no significant correlation between the quality of life and age and between the quality of life and AV severity level in teenage AV patients. Fisher-exact statistical analysis of the correlation between the quality of life and education level resulted in a p-value of 0.08; showing a significant correlation between the quality of life and education level in teenage AV patients (Table 3).

Table 2 showed cross tabulation of each questions' scoring in DLQI questionnaire and the patients number. Majority subjects got score 1 in question number 1 (62 subjects, 56.88 %) and 2 (33 subjects, 30.28%). Majority subjects got score 0 in question number 3 (69 subjects, 63.30%), number 4 (68 subjects, 62.39%), number 5 (54 subjects, 49.54%), number 6 (80 subjects,

73.40%), number 7 (84 subjects, 77.06%), number 8 (58 subjects, 53.21%), number 9 (97 subjects, 88.99%), and number 10 (70 subjects, 64.22%). Figure 1 showed mean score of each questions in DLQI questionnaire. The mean score of question number 1-10 were 0.83, 1.06, 0.44, 0.49, 0.63, 0.28, 0.28, 0.64, 0.13, and 0.41.

Table 1.
Characteristics of Respondents

Variable	N	%
Sex		
Male	46	42.20
Female	63	57.80
Age (years old)		
12	10	9.17
13	25	22.94
14	18	16.51
15	36	33.03
16	19	17.43
17	1	0.92
Level of Education		
Junior High School	53	48.62
Senior High School	56	51.38
Acne Vulgaris Severity Level		
Mild	60	55.04
Moderate	44	40.37
Severe	5	4.59
Dermatology Life Quality Index		
No effect	20	18.35
Small effect	44	40.37
Moderate effect	31	28.44
Large effect	14	12.84
Total	109	100.00

DISCUSSION

AV may cause low self-esteem, e.g. insecure feelings of physical appearance, social inadequacy and low self-esteem in meeting people for the first time. Social acceptance is a highly relevant factor in the teenage group, which may precipitate anxiety and depression. AV is a skin disorder that compromises the aesthetic factor of the face as the most exposed body area. AV will affect the self-esteem of the patients, especially in teenage with labile personalities. However, several factors such as basal self-esteem, family support, and community support may influence the self-esteem level (Kang et al., 2019; Tayel et al., 2020). DLQI was used to evaluate the quality of life in dermatologic diseases, including AV. There were

ten questions in the DLQI questionnaire. DLQI questionnaire consists of 6 main topics that are asked to the patients. The main topics in the DLQI questionnaire were symptoms or feelings, daily activities, leisure, work/school, personal relationships, and treatment (Barazzetti et al., 2019). The questions about symptoms or feelings were in the first and second questions, asking about the symptoms the patients feel (itchy, sore, painful, stinging sensation) and about the self-consciousness. The questions about daily activities were in the third and fourth questions, asking about the influence of skin complaints in daily activities (shopping, gardening, doing home activities) and how to choose the clothes. The questions about leisure were in the fifth and sixth questions, asking about how the skin complaint affected the patients in doing social activities, leisure activities, or sports. The question about work/school was in the seventh question, asking whether the skin affected the work/school. The questions about personal relationships were in the eighth and ninth questions, asking whether the skin affected the relationships of patients with partner, friends, or relatives. The question about treatment was in the last question, asking whether the treatment for the skin problems affected the patients (Lewis-Jones & Finlay, 1995).

Each question in the DLQI questionnaire has alternative answers: 'not at all', 'a little', 'a lot', and 'very much', with a score of 0, 1, 2, and 3, respectively. The score 0 also represents the answer of 'not relevant'. Each question can reach a maximum score of 3. The total score of the DLQI questionnaire is calculated by summing the score of each question. The possible total score for the DLQI questionnaire was from 0 to 30. The higher the total score, the more significant impairment of the patients' quality of life (Lewis-Jones & Finlay, 1995).

Table 2 showed that most subjects scored 0-1 on each question in the DLQI questionnaire. In this study, acne vulgaris resulted in minimal no impact on the quality of life of most patients. Figure 2 showed that the highest mean score in the DLQI questionnaire was question number 2 (1.06), followed by question number 1 (0.83), number 8 (0.64), and number 5 (0.63). In this study, the majority of effects in patients' daily lives were affecting self-consciousness, causing skin symptoms, creating problems with relatives, and affecting social or leisure activities.

The studies delivered by Finlay et al. confirmed that patients with chronic skin diseases such as atopic eczema, psoriasis, and AV, experience more significant impairment in their quality of life than patients with other skin diseases. Not only caused by the clinical manifestation or symptoms of the disease, but also caused by the skin appearance of the patients' social life (Hazarika & Archana, 2016; Lewis-Jones & Finlay, 1995).

Stress responds to any situation or factor that creates negative emotional or physical changes. AV may become a source of stress and anxiety, but stress is also one of the most important triggering factors in AV (Kodra et al., 2018). Stress increases glucocorticoids and androgens, resulting in flare condition of AV (Ocklenburg et al., 2016; Russell & Lightman, 2019; Yaribeygi et al., 2017)

This study showed a significant correlation between the quality of life and education level in teenage AV patients. Social acceptance is essential for junior and high school subjects. The refusal from surroundings caused by AV may precipitate anxiety and depression. Besides that, the high burden of education may also precipitate anxiety, one of the risk factors of AV. These conditions may decrease the quality of life of AV patients (Hosthota et al., 2016; Tasoula et al., 2012).

This study showed no significant correlation between the quality of life and AV severity level in teenage AV patients. However, the relationship between the severity of AV and quality of life is poorly understood and still controversial. In general, the role of the evaluation of AV patients is essential. Not only consists of clinical grading, but also the evaluation of DLQI in AV patients should be performed before initiating any treatment. This matter is because the significant impact of acne and its sequelae was noted on emotions, daily activities, social activities, study/work, and interpersonal relationships. Re-evaluation of DLQI during the follow-up also becomes an important indicator of the successful management of AV. A comprehensive school-based acne education program should be considered for students with AV and their parents to increase awareness about AV and its impact on the quality of life (Hazarika & Archana, 2016; Sivaramakrishnan & Jayakar, 2019).

Table 2.

Cross-tabulation of Each Question's Scoring in the DLQI Questionnaire and the Patients

DLQI Score	DLQI Question Number (n)									
	1	2	3	4	5	6	7	8	9	10
Score 0	33	31	69	68	54	80	84	58	97	70
Score 1	62	33	33	31	41	27	20	34	11	33
Score 2	13	23	6	8	14	2	5	15	0	6
Score 3	1	12	1	2	0	0	0	2	1	0

Table 3.

Cross-tabulation of Dermatology Life Quality Index with Age, Level of Education, and Acne Vulgaris Severity Level

Variable	Dermatology Life Quality Index										p
	No effect		Small effect		Moderate effect		Large effect		Total		
	n	%	n	%	n	%	n	%	n	%	
Age (years old)											
12	2	1.83	3	2.75	3	2.75	2	1.83	10	9.17	0.19
13	6	5.50	8	7.34	7	6.42	4	3.67	25	22.94	
14	1	0.92	5	4.59	8	7.34	4	3.67	18	16.51	
15	8	7.34	18	16.51	6	5.50	4	3.67	36	33.03	
16	2	1.83	10	9.17	7	6.42	0	-	19	17.43	
17	1	0.92	0	-	0	-	0	-	1	0.92	
Level of Education											
Junior High School	9	8.26	16	14.68	18	16.51	10	9.17	53	48.62	0.08
Senior High School	11	10.09	28	25.69	13	11.93	4	3.67	56	51.38	
Acne Vulgaris Severity Level											
Mild	9	8.26	24	22.02	20	8.26	7	6.42	60	55.04	0.59
Moderate	9	8.26	18	16.51	11	10.09	6	5.50	44	40.37	
Severe	2	1.83	2	1.83	0	-	1	0.92	5	4.59	
Total	20	18.35	44	40.37	31	28.44	14	12.84	109	100.00	

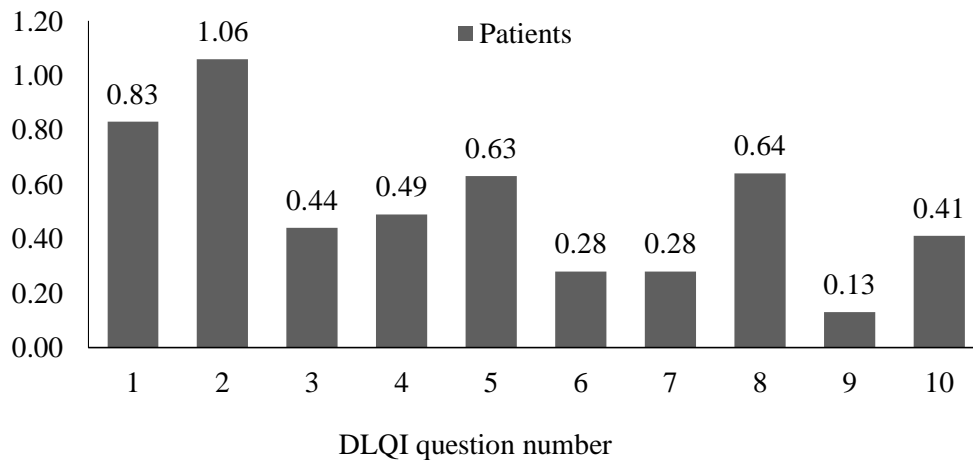


Figure 1. Mean Score Of Each Question In The DLQI Questionnaire

Research Limitation

The study was conducted without control variables, so the comparison between AV patients and non-AV patients cannot be known. Further research needs to be conducted with a more significant number of samples by including control variables to obtain better insight into the impact of acne vulgaris on the quality of life in teenage patients.

CONCLUSION

AV has a high prevalence in the teenage group. Since teenagers have low maturity to face the psychological effect, AV has a great potential to precipitate anxiety and affect the quality of life, with the level of education as the most considering factor. A comprehensive school-based acne education program should be considered to increase awareness about AV and increase their confidence while they have AV.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHOR CONTRIBUTION

All authors actively participated in research writing and were partly responsible for the content of the report. D and MAU worked on the conceptualization and writing of the first draft. NF and ZZV worked on methodology and data curation. D and ZZV were responsible for reviewing and editing the revision draft.

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