



## Original Research

# The Association between Acne Vulgaris and Stress among Adolescents in Kenjeran, Surabaya

Zsa Zsa Ollyvia<sup>1</sup>, Nining Febriyana<sup>1,2,3</sup> , Damayanti<sup>3,4</sup>, I Gusti Ayu Indah Ardani<sup>5</sup>

<sup>1</sup>Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

<sup>2</sup>Department of Psychiatry, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

<sup>3</sup>Dr. Soetomo General Hospital, Surabaya, Indonesia

<sup>4</sup>Department of Dermatology and Venereology, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

<sup>5</sup>Department of Psychiatry, Faculty of Medicine Universitas Udayana, Denpasar, Indonesia



### ARTICLE INFO

Received: November 29, 2020

Revised: January 6, 2020

Accepted: January 7, 2020

Published: May 31, 2021

\*) Corresponding author:

E-mail:

#### Keywords:

acne vulgaris

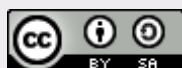
adolescents

risk factor

stress

This is an open access article under the CC BY-SA license

(<https://creativecommons.org/licenses/by-sa/4.0/>)



### Abstract

**Background:** Acne vulgaris is the main skin disease problem for adolescents. The complication of acne in adolescents is scars left on the face, which affects stress levels. Stress has harmful potential when the conditions exceed the individual's ability to cope. Kenjeran area has a tropical climate and weather which are the factors that cause acne vulgaris. **Objective:** This research aims to study the association between acne vulgaris severity and stress among adolescents in Kenjeran, Surabaya. **Methods:** This research used non-probability purposive sampling technique and observational analytic method with cross-sectional design. Assessment of the acne severity was carried out by dermatologist using Lehmann's Grading System and stress levels were assessed using the Perceived Stress Scale questionnaire in 109 adolescent subjects. **Results:** The highest frequency is women aged 15 years. The dominance is in mild acne severity with moderate stress. It was found that adolescents with acne vulgaris are at risk of experiencing stress even though the analysis of the results using fisher-exact showed that there was no significant association between the acne severity and stress level in adolescents with acne vulgaris ( $p=0.113$ ). **Conclusion:** The presence of acne vulgaris puts adolescents at risk of experiencing mild, moderate, or severe stress. It requires attention because can cause adverse effects that affect adolescents into adulthood life.

Cite this as: Ollyvia, Z., Z. Febriyana, N., Damayanti, Ardani, I. G. A. I. "The Association between Acne Vulgaris and Stress among Adolescents in Kenjeran, Surabaya". *Jurnal Psikiatri Surabaya*, vol. 10, no. 1, pp.33-39, 2021, doi: 10.20473/jps.v10i1.23483.

## INTRODUCTION

The prevalence of acne vulgaris in Indonesia is increasing every year. Acne vulgaris sufferers in Indonesia reached 60% in 2006, 80% in 2007, and 90% in 2009 [1]. Acne vulgaris is the main problem for adolescents because it causes scars on the face [2]. Previous studies have shown that acne vulgaris has a negative effect on the mental health of adolescents, one of which is experiencing stress [3][4].

Environmental factors such as climate and hot weather in Kenjeran, Surabaya can be factors causing the occurrence of acne vulgaris [5] which is a risk of stress incidence. This study aims to know the association between acne vulgaris severity and stress among adolescents in Kenjeran, Surabaya. This research is expected to be useful to increase knowledge and awareness of the importance of skin health and mental health and reduce the incidence of acne vulgaris and stress among adolescents.

## METHODS

This is an observational analytic study with cross-sectional design. Sampling was done by non-probability purposive sampling technique, with  $\alpha=0.05$  ( $z=1.96$ ). The minimum sample size was calculated using the Slovin formula [6], obtained 109 samples. Data collection was carried out in case groups consisting of students with acne vulgaris at SMPN 18 Surabaya and SMAN 3 Surabaya that located in Kenjeran, Surabaya from August 2019 until January 2020.

The study inclusion criteria included students of SMPN 18 Surabaya and SMAN 3 Surabaya who is experiencing acne vulgaris. The study exclusion criteria were samples who are not willing to be respondents. The instrument in this study used primary data in the form of Perceived Stress Scale questionnaire containing 10 question items to measure stress and to know the extent to which situations in a person's life can be assessed as stress in various levels of stress such as mild, moderate, and severe [7]. Respondents should give a rating of how often they feel things based on what is stated in the 10 question items in the last month. Physical examination was performed directly by Dermatology and Venereology physician to assess acne severity using Lehmann's grading system assessment [8].

## RESULTS

The number of respondents after inclusion and exclusion criteria was 60 students of SMPN 18 Surabaya and 49 students of SMAN 3 Surabaya who have acne vulgaris, with a total of 109 study respondents from grades 7, 8, 9, and 10. Students in grades 11 and 12 not included because at both grade levels adolescents began to get considerable academic pressure to prepare themselves for the next level of education, this could be the risk of being biased in the dependent variable, specifically stress on adolescents.

The results of the study found that adolescents with acne vulgaris at SMPN 18 and SMAN 3 Kenjeran Surabaya mostly had mild acne severity (55%), followed by adolescents with moderate acne severity (40.4%), and adolescents with severe acne severity (4.6%). Moderate stress level (82.6%,) is the dominant stress level in this study, followed by adolescents with a severe stress level (9.2%), and adolescents with a mild stress level (8.3%). These results were found to be most prevalent in the second year of experiencing acne among female adolescents aged 15 years. The presence of acne vulgaris puts adolescents at SMPN 18 and SMAN 3 Kenjeran Surabaya at risk of experiencing mild, moderate, or severe stress even though the statistical analysis test found no association between acne vulgaris severity and stress among adolescents at SMPN 18 and SMAN 3 Kenjeran Surabaya ( $p$ -value = 0.113) The analysis in this study was done in univariate way to display the characteristics of respondents and bivariate analysis using crosstabs to find out the  $p$ -value or significance of the association between acne vulgaris severity and stress with the fisher-exact test using SPSS for Windows version 25. It is said to be significant or influential if the  $p$ -value  $<0.05$ .

**Table 1. Characteristics of Respondents**

	Category	Frequency (n)	Percentage (%)
1	Gender		
	a. Male	46	42.2
	b. Female	63	63
<b>Total</b>		<b>109</b>	<b>100</b>
2	Age		
	a. 12	10	9.2
	b. 13	25	22.9
	c. 14	18	16.5
	d. 15	36	33
	e. 16	19	17.4
	f. 17	1	0.9

Total	109	100
3	Duration of experiencing acne	
a. < 1 year	22	20.2
b. 1 year	22	20.2
c. 2 years	33	30.3
d. 3 years	25	22.9
e. 4 years	5	4.6
f. 5 years	2	1.8

Total	109	100
-------	-----	-----

Table 1 shows that most respondents are in the female gender group (63%) with the age of 15 years (33%). Most of the adolescents have had acne for 2 years (30.3%).

**Table 2. Perceived Stress Scale Frequency**

	Stress level	Frequency (n)	Percentage (%)
1	Mild stress	9	8.3
2	Moderate stress	90	82.6
3	Severe stress	10	9.2
Total		109	100

Table 2 shows that most stress level in adolescents is a moderate stress level (82.6%).

**Tabel 3. Lehmann Score Frequency**

No	Acne vulgaris severity	Frequency (n)	Percentage (%)
1	Mild acne	60	55
2	Moderate acne	44	40.4
3	Severe acne	5	4.6
Total		109	100

Table 3 shows that the most acne severity in adolescents is mild acne severity (55%).

**Table 4. Research Analysis**

Perceived Stress Scale	Lehmann Score			Total	P
	Acne severity				
	Mild	Moderate	Severe		
Mild stress	8 7.3%	1 0.9%	0	9 8.3%	
Moderate stress	49 45%	36 33%	5 4.6%	90 82.6%	

Severe stress	3 2.8%	7 6.4%	0	10 9.2%	0.11 5
Total	60 55%	44 40.4%	5 4.6%	109 100%	

Table 4 shows that moderate stress in adolescents with mild acne is the largest group in this study (45%). It also shows the association between acne vulgaris severity and stress among adolescents has a p-value > 0.05 (p = 0.113), which means both variables didn't have a significant association based on statistic analysis test.

## DISCUSSION

### Stress among adolescents

Among adolescents in the Kenjeran area, Surabaya, the highest level of stress was moderate stress. The stress symptoms are divided into two, namely physical and psychological. Physical symptoms include headache, high blood pressure, chest pain or tachycardia, insomnia, indigestion. Psychological symptoms include feeling anxious, decreased concentration, frequent daydreaming, gloom, and loss of enthusiasm [9]. The dominance of adolescents with moderate stress levels is obtained because adolescence is an intermediate age between children and adults where many new things happen to adolescents, this makes adolescents receive different stressors compared to childhood life. This triggers the emergence of stress which has an impact on adolescent life. But on the other hand, adolescence is a period of maturity to become a more mature individual. Adolescents have better tolerance or better coping mechanism for stress so that a small percentage is obtained on the results of severe stress level data.

This study was similar to a study conducted by Tanaka (2018) on 100 students of SMA 2 Sutomo in North Sumatra regarding the influence of stress levels on the severity of acne vulgaris using unpaired categorical analytical research designs showed the same results, 24% of students had a with mild stress, 52% of students had moderate stress levels, and 24% of students had severe stress levels [10].

The results showed that the incidence of stress was found to be quite high in adolescents, especially adolescents with acne vulgaris. Factors that can influence the emergence of stress to a certain level in adolescents can be divided into two factors, namely internal and external factors. One of the internal factors is personality [11], the population in this study mostly comes from the Madurese tribe, which tends to apply

authoritarian and permissive parenting in which parents educate children hard [12] so that it may affect the personality of adolescents. Meanwhile, external factors include social environment and place of residence [13]. The research location is close to the coastal area of Kenjeran Beach which has a tropical climate and hot weather. Furthermore, internal factors can come from within a person, for example, physical condition of adolescent, one of which is the incidence of acne vulgaris.

#### **Acne severity among adolescents**

The study found that the dominant level in adolescents in the Kenjeran area, Surabaya was adolescents who had acne with a mild degree of severity. In adolescents, there are hormonal changes that trigger acne. Social change also occurs in adolescents and takes an important role. Adolescents have begun to expand social relationships and are more outside the home to do a lot of activities so that the mobility of adolescents is increasing, most of which are done using motorized vehicles, this can be one of the causes of adolescents experiencing mild acne. As well as the presence of air pollution and the condition of the surrounding environment which is predominantly hot because SMPN 18 Surabaya and SMAN 3 Surabaya are close to the beach and sea which can also cause many adolescents at SMPN 18 Surabaya and SMAN 3 Surabaya experiencing mild acne. Another reason why the result was found a dominant degree of mild acne severity was probably because many adolescents of the study subjects medicated their acne and do facial treatment, thus when the study was conducted the acne was found to be not too severe.

A study conducted by Aqsha et al (2016) regarding the profile of the selection and use of anti-acne products using the cross-sectional method and descriptive-analytical research design on 100 students of campus B of Airlangga University, obtained the same results as many as 71% of respondents had mild acne severity, 26% of respondents had moderate acne severity, and 3% respondents had severe acne severity [14]. Another study conducted by Ogedegbe and Henshaw (2014) regarding the severity and impact of acne vulgaris on the quality of life of adolescents in Nigeria using the cross-sectional method on 160 high school students in Mushin in 2009, found that 89.4% had mild acne severity, 10% had moderate acne severity, and 0.6% had severe acne severity. However, in this study, there were differences in the assessment criteria used to determine the severity of acne.

This study used the Lehmann Score assessment criteria, while the study conducted by Ogedegbe and Henshaw used the Global Acne Grading System (GAGS) assessment criteria [15].

The factors that can affect the onset of acne vulgaris in adolescents are divided into two factors, internal and external. Internal factors come from within the individual's body, including race, familial, and hormonal. Meanwhile, external factors include the food consumed, the season in which the individual lives, and the psychological condition they have. Sometimes these factors cannot be avoided by adolescents, causing acne vulgaris to appear [16]. The causes of acne vulgaris are multifactorial, including genetic factors, race factors, dietary factors, climatic factors, skin type factors, cosmetic factors, stress factors, infectious factors, and occupational factors [17][18].

#### **The association between acne vulgaris and stress among adolescents**

In relation to the tolerance to stressors received by adolescents, adolescents in this study were found to have mild stress levels at all levels of severity of acne, which means that the greater the stressor received by the individual does not always have a greater impact on each individual, depending on the tolerance that is owned by each individual in response to a stressor. From the results, it was found that the dominance of moderate stress levels occurred in adolescents with mild acne. Adolescents with mild acne are not used to the acne on their skin and face, causing psychological reactions in the form of feelings of shame, discomfort, lack of self-confidence, and so on. These adolescents received stressors which they considered large enough while their tolerance was not too able to respond to the stressors received, so it was found that moderate levels of stress were dominant in adolescents who experienced acne vulgaris.

The results of the fisher-exact test show the value of  $p = 0.113$  and the association is said to be significant if the value is less than the value of  $\alpha (0.05)$ . This shows that the results of this study are that there isn't a significant association between acne vulgaris and stress among adolescents in Kenjeran, Surabaya. The results showed that there was no association between acne vulgaris experienced by adolescents and the level of stress caused because there are many other factors affecting the level of stress in adolescents that cannot be controlled, these factors play a more important role and have more influence on the psychological condition of adolescents. Some of the conditions that affect the manifestation of stress are potential

Acne Vulgaris and Stress among Adolescents in Kenjeran, Surabaya  
stressors, educational, maturity, socio-cultural, physical  
conditions, personality types, and environmental situations  
[19].

This research was conducted in the Kenjeran area which is located in the northern part of Surabaya and quite far from the city center. Environmental factors affect the manifestations of stress that occur in adolescents. The stress response received by adolescents in suburban areas will be different from adolescents who usually live in the city center. Adolescents in the city center have higher pressure from the surrounding environment, one example is the concern about the other people's perceptions about their appearance, while adolescents in the suburbs do not pay much attention to their appearance so that adolescents will do better to respond to the stressors caused by the acne conditions.

The stressor received by each individual will give a different reaction, even though the stressor is the same stressor. There are personal resources as well as defense mechanisms that characterize the individual. If the defense mechanism is functioning properly, the stressors faced can be handled adequately and stress will not arise [20]. Acne can affect adolescents deeply psychologically, as well as physical disorders, in adolescents acne can have an impact on their social and psychological functions. Some of it has been shown to affect self-esteem levels and quality of life, and also at risk of depression and anxiety (insecurity) [21]. Acne vulgaris affects adolescent's psychological condition that has many components. For example, in research conducted by experts, it was found that there was an association between people with acne vulgaris and various psychological factors including depression, anxiety, personality, emotions, self-concept, self-confidence, social acceptance, and dissatisfaction with the body [22].

This study is in line with research conducted by Karauwan et al. (2018) with the subject of 40 students of grade 9 SMP found that there was no association between stress and acne vulgaris, with a p-value of 0.327 ( $p > 0.05$ ) [23]. Another study that supports the results of this study was conducted by Miranda (2018) using the DASS questionnaire on 103 adolescents in one of the high schools in Padang, West Sumatera obtained a p-value of 0.076 ( $p > 0.05$ ) which means there is no significant association between stress levels and acne vulgaris [24]. The higher severity of acne, the greater impact on the social and psychological functioning of adolescents [25]. It was found in another study conducted by Khan (2017) with the research subject is

adolescents in high schools in India, which had results related to several psychological conditions for adolescents with acne. As many as 33% of the research subjects were emotionally affected by the presence of acne, and about 5% of the study subjects thought that acne was very disturbing. The psychological impact of acne on adolescents was found that 52% had low self-esteem, 43.2% were not happy with their appearance, and about 4.1% of adolescent felt sad that they could not endure it [3].

The occurrence of acne vulgaris has a considerable influence on several other psychological conditions in adolescents, while the risk of stress is not that affected. Although the results of statistical analysis showed that there was no association between acne vulgaris and stress, the problem of stress in adolescents with acne vulgaris cannot be underestimated and ignored because found a large percentage of the results in this study subject data. People especially adolescents with acne vulgaris were at risk of experiencing stress.

### Research Limitation

The study did not use control variables, thus a comparison could not be made between normal people who were not sufferers of acne vulgaris and sufferers of acne vulgaris. In addition, adolescence is the peak of human instability, therefore, the activities and behavior of adolescents depend on emotional conditions, this allows adolescents to have emotional lability and their answers to the questionnaire will change according to mood, causing bias in data.

### CONCLUSION

The result of this study found no association between acne vulgaris severity and stress based on statistical analysis. The presence of acne vulgaris puts adolescents at risk of experiencing mild, moderate, or severe stress. It requires attention because can cause adverse effects that affect adolescents into adulthood life. At Dr. Soetomo Hospital, there is a Department Of Dermatology and Venereology that can be used by the community, especially adolescents with acne vulgaris in the Kenjeran or other areas in Surabaya to carry out examinations to get treatment with the aim of maintaining health and reducing the incidence of acne vulgaris. Also, there is a Department Of Psychiatry in Child and Adolescent Division as means of detection, consultation, and further therapy for the mental health of the community, especially

adolescents to resolve stress and maintaining mental health.

### Acknowledgments

I would like to thank Prof. H. Dr. Budi Santoso, dr., Sp. OG (K) as dean of faculty of medicine, Nining Febriyana, dr. Sp. KJ (K) as the main supervisor, Damayanti, dr. Sp. KK (K), FINS-DV and Dr. Yunias Setiawati, dr. Sp. KJ (K) as the second supervisor. The results of this research must be explained properly so as not to cause misunderstandings about the association between acne vulgaris severity and stress in adolescents.

### REFERENCES

- [1] R. A. Purwaningdyah, K. Jusuf, and N. Karmila, "Profil Penderita Akne Vulgaris pada Siswa-Siswi di SMA Shafiyatul Amaliyyah Medan (Acne Vulgaris Patient Profiles of Shafiyatul Amaliyyah Medan High School Students)," *e-jurnal Fak. Kedokt. USU*, vol. 1, no. 1, pp. 1–8, 2013.
- [2] M. Eyuboglu, I. Kalay, and D. Eyuboglu, "Evaluation of adolescents diagnosed with acne vulgaris for quality of life and psychosocial challenges," *Indian J. Dermatol.*, vol. 63, no. 2, pp. 131–135, 2018, doi: 10.4103/ijd.IJD\_671\_16.
- [3] E. Tasoula *et al.*, "O impacto da acne vulgar na qualidade de vida e saúde psíquica em jovens adolescentes na grécia. resultados de uma pesquisa populacional," *An. Bras. Dermatol.*, vol. 87, no. 6, pp. 862–869, 2012, doi: 10.1590/S0365-05962012000600007.
- [4] G. N. Vilar, "Quality of life, self-esteem and psychosocial factors in adolescents with acne vulgaris," *An Bras Dermatol*, vol. 90, no. 5, pp. 622–629, 2015, doi: 10.1590/abd1806-4841.201533726.
- [5] A. Djuanda, *Ilmu Penyakit Kulit dan Kelamin*, 6th ed. Jakarta: Fakultas Kedokteran Universitas Indonesia, pp. 9-35, 2017.
- [6] Sugiyono, *Metode Penelitian: Kuantitatif, Kualitatif, dan R&D*, 1st ed. Bandung: Alfabeta, pp. 100-120, 2019.
- [7] S. Cohen, T. Kamarck, and R. Mermelstein, "A global measure of perceived stress.," *J. Health Soc. Behav.*, vol. 24, no. 4, pp. 385–396, 1983, doi: 10.2307/2136404.
- [8] H. P. Lehmann, K. A. Robinson, J. S. Andrews, V. Holloway, and S. N. Goodman, "Acne therapy: A methodologic review," *J. Am. Acad. Dermatol.*, vol. 47, no. 2, pp. 231–240, 2002, doi: 10.1067/mjd.2002.120912.
- [9] B. McEwen and R. Sapolsky, "Stress and Your Health," *J. Clin. Endocrinol. Metab.*, vol. 91, no. 2, 2006, doi: 10.1210/jcem.91.2.9994.
- [10] J. Tanaka, "Pengaruh Tingkat Stres dengan Tingkat Keparahan Akne Vulgaris pada Siswa-Siswi Kelas III SMA Sutomo 2," *Repos. USU*, 2018, [Online]. Available: <http://repositori.usu.ac.id/handle/123456789/13559>.
- [11] A. Thapar, S. Collishaw, D. S. Pine, and A. K. Thapar, "Depression in adolescence," *Lancet*, vol. 379, no. 9820, pp. 1056–1067, 2012, doi: 10.1016/S0140-6736(11)60871-4.
- [12] V. A. Nauli, K. Karnadi, and S. M. Meilani, "Peran Ibu Pedagang Pasar 24 Jam Terhadap Perkembangan Moral Anak (Penelitian Studi Kasus di Kota Bekasi)," *J. Obs. J. Pendidik. Anak Usia Dini*, vol. 3, no. 1, p. 241, 2019, doi: 10.31004/obsesi.v3i1.179.
- [13] C. McNeely and J. Blanchard, *The Teen Years Explained: A guide to Healthy Adolescent and Development*. Baltimore: Center of Adolescent Health at the Johns Hopkins Bloomberg School of Public Health, pp. 4, 2009.
- [14] A. C. Aqsha *et al.*, "Profil pemilihan dan penggunaan produk anti-jerawat yang tepat pada mahasiswa," *J. Farm. Komunitas*, vol. 3, no. 1, pp. 18–22, 2016, [Online]. Available: <http://journal.unair.ac.id/JFK@profil-pemilihan-dan-penggunaan-produk-anti-jerawat-yang-tepat-pada-mahasiswa-article-12473-media-98-category-15.html>.
- [15] E. E. Ogedegbe and E. B. Henshaw, "Severity and impact of acne vulgaris on the quality of life of adolescents in Nigeria," *Clin. Cosmet. Investig. Dermatol.*, vol. 7, pp. 329–334, 2012, doi: 10.2147/CCID.S73302.
- [16] P. Jarrett, "Acne vulgaris," *Encyclopedia of Pharmacy Practice and Clinical Pharmacy*, 2019. <https://emedicine.medscape.com/article/1069804-overview> (accessed May 23, 2020).
- [17] R. N. Smith, N. J. Mann, A. Braue, H. Mäkeläinen, and G. A. Varigos, "A low-glycemic-load diet improves symptoms in acne vulgaris patients: A

- randomized controlled trial,” *Am. J. Clin. Nutr.*, vol. 86, no. 1, pp. 107–115, 2007, doi: 10.1093/ajcn/86.1.107.
- [18] J. Rao, “Acne Vulgaris,” *Medscape*, 2020. <https://emedicine.medscape.com/article/1069804-overview> (accessed Jun. 03, 2020).
- [19] Soewadi, *Simptomatologi dalam Psikiatri*. Yogyakarta: Percetakan MEDIKA FK UGM, pp. 14-17, 1999.
- [20] H. Kaplan, B. Sadock, and J. Grebb, *Kaplan and Sadock’s Synopsis of Psychiatry: Behavioral Sciences Clinical Psychiatry*, 7th ed., vol. 7, no. 11. Baltimore: Williams & Wilkins, pp. 2063-2073, 2994.
- [21] O. Revol, N. Milliez, and D. Gerard, “Psychological impact of acne on 21st-century adolescents: Decoding for better care,” *Br. J. Dermatol.*, vol. 172, no. S1, pp. 52–58, 2015, doi: 10.1111/bjd.13749.
- [22] R. J. Lasek and M. M. Chren, “Acne vulgaris and the quality of life of adult dermatology patients,” *Arch. Dermatol.*, vol. 134, no. 4, pp. 454–458, 1998, doi: 10.1001/archderm.134.4.454.
- [23] G. Karauwan, R. Rumende, and E. Makausi, “The Correlation Of Stress And Facial Hygiene With Acne Vulgaris Disease Of Nineth Grade Student In Tondano JHS,” *E-Jurnal Sariputra. Univ. Sariputra Indones. Tomohon*, vol. 4, no. 2, pp. 30–34, 2018, [Online]. Available: <http://jurnal.unsrittomohon.ac.id/index.php?journal=ejournal&page=article&op=view&path%5B%5D=389&path%5B%5D=355>.
- [24] D. Miranda, “Hubungan Tingkat Stres Dengan Kejadian Akne Vulgaris Pada Siswa Madrasah Aliyah Swasta Ar-Risalah Padang Tahun 2018,” Universitas Andalas, pp. 1-37, 2018.
- [25] A. Khan, “Acne and it’s associations with psychosocial well-being among adolescents in Nellore (India),” Lithuanian University of Health Sciences, Faculty of Public Health, pp. 1-40, 2017.