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THE RELATIONSHIP BETWEEN SMOKING BEHAVIOR AND THE INCIDENCE OF GENERALIZED ANXIETY DISORDER (GAD) IN UNIVERSITY STUDENTS

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ABSTRACT
Generalized Anxiety Disorder (GAD) is a psychological disorder characterized by excessive worry and uncontrollable responses that persist continuously and can be experienced by both men and women. The Ministry of Health indicates that 47.7% of Indonesian adolescents experience anxiety disorders. Based on data from the National Adolescent Mental Health Survey (I-NAMHS) in 2022, it was revealed that in the past year, 155 million adolescents in Indonesia suffered from mental health disorders such as anxiety disorders. This study aims to identify the correlation between smoking behavior and GAD cases among students at Muhammadiyah University Surakarta from the 2021 to 2024 cohorts. This is a quantitative study using a cross-sectional approach. The sample consists of 240 active male students at UMS. The sampling technique used was stratified random sampling. The instrument used was a standardized questionnaire from the Anxiety and Depression Association of America (ADAA), which has been translated into Indonesian and tested for validity and reliability. The questionnaire demonstrated validity and reliability with a Cronbach's Alpha value 0.938. The research data were analyzed using univariate analysis to determine the characteristics of the respondents, such as age, class, and faculty. Bivariate analysis was performed using the Chi-square test. Bivariate analysis was conducted on the dependent and independent variables, namely the relationship between smoking behavior and GAD, as well as an additional test on the variable of the number of cigarettes consumed per day. The statistical test results indicate that there is no significant correlation between smoking behavior and GAD incidence with a value of (P = 0.090). Meanwhile, the test results on the relationship between the number of cigarettes consumed per day and GAD incidence show a weak correlation with a value of (P = 0.010).

Keywords: collage; general anxiety disorder (GAD); smoking behavior; smoking category

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INTRODUCTION

According to the WHO, Generalized Anxiety Disorder (GAD) is a psychological disorder that affects both women and men, characterized by excessive and uncontrollable worry that persists over time, as well as an exaggerated response to uncertainty (Kim & Justin Kim, 2021). Anxiety disorders are the ninth leading cause of mental health disability, with a global prevalence of 3.6% (Banushi et al., 2023)(Soen et al., 2022). In 2021, approximately 76.2 million people worldwide experienced anxiety disorders. This figure increased by 25.6%, with an incidence rate of 4 cases per 100,000 population (Santomauro et al., 2021). A survey conducted by the Global School-based Health Survey (GSHS) showed that 40% of adolescents experienced anxiety, 7.33% experienced suicidal ideation, and 60.17% had emotional mental symptoms (Mubasyiroh et al., 2017). Data from the Ministry of Health (2021) shows that 47.7% of Indonesian adolescents experience anxiety disorders, while 11.6% of adults (aged ≥18 years) experience mental health disorders, particularly anxiety and depression (Philian Goszal, Irene Miracle, 2023) (Soen et al., 2022). Furthermore, research from the National Adolescent Mental Health Survey (I-NAMHS) in 2022 revealed that in the past year, 155 million adolescents in Indonesia suffered from mental health disorders such as anxiety disorders (Erskine et al., 2024).

Generalized Anxiety Disorder can be caused by several factors. First, etiological factors such as negative life events, including family conflicts, abuse, negative trauma, and significant loss affect psychology (Newman et al., 2011). Second, genetic factors; a comprehensive review study states that genetic factors make a person more susceptible to anxiety disorders, with a threefold increased risk. (Mishra & Varma, 2023). The third factor is medical conditions and disorders, such as cardiovascular diseases, endocrine and metabolic disorders, respiratory disorders, and anemia, which can trigger anxiety (Octaviani & Sunarti, 2020). In addition to illness, excessive consumption of medications such as carbamazepine, SSRI antidepressants, felodipine, quinolones, antibiotics, isoniazid, theophylline, prednisone, levodopa, ibuprofen, and others, as well as narcotic and psychotropic substances, can also trigger anxiety (Octaviani & Sunarti, 2020). In addition to the factors mentioned above, smoking habits can trigger anxiety. Cigarettes can induce feelings of comfort and calmness, thereby alleviating stress and providing comfort. This is further reinforced by the presence of nicotine in cigarettes, whether electronic or conventional (Husna & Jannah, 2019). While smoking can alleviate stress and anxiety disorders, active smokers may develop medical conditions that contribute to panic symptoms (Moylan et al., 2012).

Generalized Anxiety Disorder (GAD) is one of the mental disorders that can have a significant impact on various aspects of a person's life. This disorder affects social life, work, family relationships, and the psychological condition of the individual. Individuals with GAD tend to withdraw from social environments and avoid interacting with others, which can disrupt their daily activities (Al Mubarok et al., 2022). In the workplace, GAD can reduce concentration and decision-making ability during work due to impaired memory and cognitive flexibility (Asfour, 2024). Additionally, GAD also impacts family relationships, as individuals with GAD often struggle to interact or communicate with their family members (Ma et al., 2024). From a psychological perspective, GAD can cause insomnia and increase the risk of depression. Research shows that individuals with sleep disorders due to GAD often wake up 1-3 times per night during a sleep period lasting 2-3 weeks (Warsyena & Wibisono, 2021; Satura et al., 2025). One behavioral factor frequently associated with sleep disturbances and anxiety symptoms is smoking(Bilsky et al., 2021).

Smoking behavior refers to the act or habit of smoking, including how often, how long, and the role of cigarettes (Hendra Setyoko et al., 2024). The prevalence of smoking in Indonesia is very high across various segments of society, particularly among men, from children, and adolescents, to adults (Fadia et al., 2023). Smoking behavior can be influenced by internal and external factors (Nurjannah et al., 2023). Lawrence Green's theory explains that there are three main components influencing smoking habits: predisposing factors, enabling factors, and reinforcing factors. The factors most frequently impacting smoking behavior are an individual's knowledge and attitudes (Nurhasanah & Kurnia, 2023). The factors influencing smoking behavior among students at the Faculty of Health Sciences, Ibnu Khaldun University, Bogor, West Java Province, in 2021 can vary, according to research conducted by (Meriyadi, 2022), namely knowledge, character, and peer influence. However, in the study by Aini et al. (2024), factors such as cigarette advertising, parental role, and the availability of cigarettes on campus became dominant factors enabling a fivefold increase in smoking.

Previous studies on the relationship between smoking behavior and Generalized Anxiety Disorder (GAD) have shown varying results. Some studies indicate no relationship, while others show a relationship. These differences in results have been found in both foreign and domestic studies. Studies conducted by (Luo et al., 2023) and (Mustakim, 2022) indicate a significant association between smoking and increased depression and anxiety. Meanwhile, the study by (Nadya Husna Rumasoreng, 2023) found a fairly strong association between

smoking and anxiety. Therefore, the researchers are interested in further investigating the relationship between smoking behavior and the occurrence of Generalized Anxiety Disorder (GAD) among students at Muhammadiyah University of Surakarta (UMS).

METHOD

This research design applies a quantitative method with a cross-sectional approach. The research was conducted at Universitas Muhammadiyah Surakarta (UMS) in February 2025. The population in this study involved 10,664 active male students at Muhammadiyah University Surakarta from the 2021 to 2024 cohorts. The sample size was calculated using Lemeshow's formula for a known population with an estimated proportion of 0.2 and a sampling error of 5% (0.05), resulting in a sample size of 240 respondents. Sampling for each faculty used the stratified random sampling method so that the sample size for each faculty could be taken evenly. This study has obtained approval from the Health Research Ethics Committee (KEPK) of the Faculty of Health Sciences, Muhammadiyah University of Surakarta (FIK-UMS), as documented in Ethics Approval Number: No.791/KEPK-FIK/I/2025.

Data collection was conducted using a smoking behavior questionnaire consisting of four questions. The smoking behavior questions included current smoking status, number of cigarettes consumed per day, duration of smoking, and type of cigarettes used. The research instrument used has been validated for validity and reliability. In the smoking behavior questionnaire, all items are valid, and the reliability test results show a Cronbach's Alpha value of 0.938. The determination of respondents' anxiety status was based on the GAD-7 questionnaire from the Anxiety and Depression Association of America (ADAA), which consists of 7 questions. The researcher translated the questionnaire into Indonesian to avoid misunderstandings, as the respondents were Indonesian students. During the translation process, the researcher used the DeepL Translate platform and asked the research supervisor to review the translation. After translation, the researcher tested the validity and reliability of the questionnaire using SPSS, which showed that the questionnaire was valid and reliable with a Cronbach's Alpha value of 0.855. The GAD-7 assessment has four response options: Not at all, Several Days, More than Half the Days, and Nearly Every Day. Each option selected has a different score: “Never” has a weight of 0 (zero), “Several Days” has a weight of 1 (one), “More than Half the Days” has a weight of 2 (two), and “Nearly Every Day” has a weight of 3 (three). To analyze the data, the Chi-square test was used to identify the relationship between smoking behavior and GAD incidence.

RESULT

Table 1.
Frequency Distribution Based on Respondent Characteristics (n=240)

Variabel	f	%
Respondent Age		
17	2	0,8
18	7	2,9
19	48	20,0
20	59	24,6
21	67	27,9
22	54	22,5
23	2	0,8
24	1	0,4
Force		
2021	79	32,9
2022	66	27,5
2023	42	17,5
2024	53	22,1

Variabel	f	%
Faculty		
Farmasi	3	1,3
Business Economics	62	25,9
Law	23	9,6
Health Sciences	15	6,2
Medicine	7	2,9
Dentistry	4	1,7
Informatics Communication	34	14,2
Teacher Training and Education	41	17,1
Geography	3	1,3
Psychology	7	2,9
Technical	41	17,1

Based on the distribution of respondent characteristics, the majority of respondents were 21 years old, from the class of 2021, and most were from the Faculty of Economics and Business. The distribution of respondents by faculty was evenly distributed according to calculations using stratified random sampling.

Table 2.
Distribution of Smoking Behavior Frequency of Male Students (n=240)

Smoking Behavior	f	%
No smoking	123	51,2
Smoke	117	48,8

The frequency distribution table of smoking behavior among male students at Muhammadiyah University Surakarta (UMS) from 240 respondents shows that 123 respondents do not smoke (51.2%) and 117 respondents smoke (48.8%).

Table 3.
Distribution of Anxiety Levels for Male Students (n=240)

Category: GAD	f	%
Minimal Anxiety	147	61,3
Mild Anxiety	69	26,7
Moderate Anxiety	18	7,5
Severe Anxiety	6	2,5

Based on the anxiety level distribution table of 240 respondents, there were 147 respondents who experienced minimal anxiety (61.3%), 69 respondents had mild anxiety, 18 respondents had moderate anxiety (7.5%), and 6 respondents had severe anxiety (2.5%).

Table 4
Test Results of the Relationship of Smoking Behavior with the Incidence *of Generalized* Anxiety Disorder

Smoking Behavior	*General Anxiety Disorder*										P value	OR (95% CI)
	Minimal Anxiety		Mild Anxiety		Moderate Anxiety		Severe Anxiety		Total			
	f	%	f	%	f	%	f	%	f	%		
No Smoking	81	65,9	28	22,8	9	7,3	5	4,1	123	100	0,09	
Smoke	66	56,4	41	35,0	9	7,7	1	0,9	117	100	0	

The test was conducted using the Chi-Square test to identify the correlation between the two variables. The test results based on smoking behavior and the incidence of Generalized Anxiety Disorder showed that 65.9% of non-smokers experienced minimal anxiety, 22.8% had mild anxiety, 7.3% had moderate anxiety, and 4.1% had severe anxiety. Meanwhile, among respondents who smoked, 56.4% experienced minimal anxiety, 35.0% had mild anxiety, 7.7% had moderate anxiety, and 0.9% had severe anxiety. The results of the test showed a P-value of 0.090, where $P > 0.05$. The probability value (P) has a tolerance limit of 0.05. In a Chi-Square test, the hypothesis is accepted if the P-value is less than 0.05. However, in this result, the P-value is greater than 0.05, meaning there is no specific

relationship between smoking behavior and cases of Generalized Anxiety Disorder (GAD) among students at Muhammadiyah University of Surakarta.

Table 5.
Test Results of Smoker Categories Based on the Number of Cigarettes Consumed per Day

Smoker Categories Based on the Number of Sticks Consumed Per Day	*General Anxiety Disorder*										P value	OR (95% CI)
	Minimal Anxiety		Mild Anxiety		Moderate Anxiety		Severe Anxiety		Total			
	f	%	f	%	f	%	f	%	f	%		
Light Smokers (1-10)	52	52,5	40	40,4	6	6,1	1	1,0	99	100	0,010	
Moderate Smokers (11-20)	14	77,8	1	5,6	3	16,7	0	0,0	18	100		
Heavy Smokers (<20)	0	0,0	0	0,0	0	0,0	0	0,0	0	100		

Paragraf baru In this table, researchers conducted additional tests to examine further the relationship between smoking behavior and the incidence of GAD. The additional test used a sample of smokers, namely the number of cigarettes consumed per day, and the incidence of GAD.

Based on statistical tests of smoking categories based on the number of cigarettes consumed per day and the incidence of GAD, it was found that 52.5% of light smokers experienced minimal anxiety, 40.4% had mild anxiety, 6.1% had moderate anxiety, and 1.0% had severe anxiety. Among moderate smokers, 77.8% had minimal anxiety, 5.6% had mild anxiety, 16.7% had moderate anxiety, and 0.0% had severe anxiety. Among heavy smokers, no respondents were found to have anxiety. The results of this test have a P-value >0.05 or a significance level of 0.010, indicating a weak association between the number of cigarettes consumed per day and the occurrence of Generalized Anxiety Disorder (GAD) among students at Muhammadiyah University of Surakarta.

DISCUSSION

The Relationship of Smoking Behavior to the Incidence of Generalized Anxiety Disorder (GAD)

According to Lawrence Green's theory of health behavior, health behavior depends on predisposing factors, facilitating factors, and reinforcing factors. These factors determine an individual's lifestyle (Fiana & Indarjo, 2024). This theory is consistent with the incidence of GAD at Muhammadiyah University Surakarta (UMS). Based on Table 4 in the results section, no significant relationship was found between smoking behavior and the occurrence of GAD. Non-smokers can also experience anxiety, although it is more common at minimal anxiety levels. This finding is supported by previous research on longitudinal studies assessing the relationship between tobacco use and mental disorders, showing that tobacco use does not significantly increase the risk of anxiety disorders (RR=1.21; 95% CI=0.87–1.68) (Burke et al., 2023). Another study conducted in South Korea found no significant association between tobacco product use and the occurrence of GAD after adjusting for factors such as age, gender, and socioeconomic status (Cho et al., 2024).

There are several factors that contribute to why non-smoking students experience GAD. Research conducted by (Moon & Woo, 2024) explains that poor sleep quality and fatigue after sleep are strong factors in GAD regardless of smoking status. Final-year students tend to experience stress due to academic or assignment demands. According to (Cahyadi & Sulistyaningtyas, 2025), final-year students experience varying levels of academic stress, which impacts their physical, emotional, and behavioral conditions. Additionally, perceptions or the influence of social support affect academic anxiety (Laksmiwati & Tondok, 2023). Students who are still classified as adolescents are vulnerable to anxiety because they have not yet reached mental and social maturity, making them highly susceptible to psychological disorders such as anxiety (Firdaus et al., 2024). A study in Singapore noted that exposure to

cigarette smoke or secondhand smoke (SHS) can increase negative feelings, which can lead to stress, including anxiety (Tan et al., 2022). Cigarette smoke contains free radicals such as peroxynitrite, hydrogen peroxide, and superoxide, which can damage cells due to oxidative stress. These components are one of the triggers for anxiety (Nashihuddin et al., 2015).

The Relationship of the Number of Cigarettes Smoked Per Day with the Incidence of GAD

With test results showing no correlation between smoking behavior and the occurrence of GAD, researchers conducted a study based on the number of cigarettes consumed per day and the occurrence of GAD. The results showed that there was a significant correlation between the number of cigarettes consumed and GAD. The test results indicated that smokers, both light and moderate smokers, are at higher risk of developing generalized anxiety disorder (GAD). Smoking, especially in large quantities, can trigger the onset of specific anxiety disorders such as Generalized Anxiety Disorder. Individuals who smoke approximately 20 cigarettes per day have a higher risk of developing Generalized Anxiety Disorder, panic disorder, and agoraphobia (Johnson et al., 2000)(Goodwin et al., 2005)(Byeon, 2015). This study is consistent with research conducted by Mayah (2021), which shows that the more stressed or anxious an individual is, the more cigarettes they consume.

The reason smokers are more prone to anxiety disorders, according to the self-medication theory, is that individuals who smoke to reduce psychological symptoms may actually worsen their mental condition, particularly the anxiety they experience. In the study Anxiety and Depression among Smokers among University Students: A Systematic Review, smoking as a coping mechanism actually exacerbates psychological symptoms and reduces the quality of life for smokers (Abdullah et al., 2025). The nicotine content in cigarettes can induce unpleasant feelings such as anxiety, stress, difficulty controlling oneself, and irritability (Liem, 2010). Nicotine in cigarettes activates nicotinic acetylcholine receptors (nAChRs), which influence the release of neurotransmitters. This activity provides a calming effect but is temporary. However, long-term use can lead to receptor desensitization, which may worsen anxiety symptoms.

Continuous smoking behavior can have an impact on health. Teenagers who smoke are at high risk of experiencing health problems other than anxiety, such as respiratory disorders, coronary heart disease, lung cancer, stroke, and other health problems (Sma et al., 2024) (Sebtiana et al., 2025). In addition to affecting health, smoking behavior also impacts social aspects such as declining academic performance and impaired quality of life (Pinaria et al., 2023). To prevent this, supportive measures are needed, such as intervention approaches to reduce smoking behavior among students, including education and anti-smoking campaigns, as well as the implementation of Smoke-Free Zones (SFZs) on campus (Pamungkas et al., 2020) (Nurhasanah & Kurnia, 2023). Many students experiencing anxiety can be provided with mental health counseling services by the university, and counselors can offer information on coping mechanisms that students can try (Fitri, 2023).

CONCLUSION

This study concluded that smoking behavior is not specifically related to the occurrence of Generalized Anxiety Disorder (GAD). This was proven by the results of the Chi-Square test, with a P-value of 0.090. Non-smokers experienced more anxiety than smokers. Stress-related factors experienced by respondents, as well as exposure to cigarette smoke, can influence a person's emotional and psychological state, leading to anxiety disorders. Meanwhile, the results of an additional test based on the number of cigarettes consumed per day and the occurrence of GAD showed a significant but weak association. Respondents who smoke, whether light smokers (1-10 cigarettes/day) or moderate smokers (11-20 cigarettes/day), are

at a higher risk of experiencing anxiety disorders (GAD). This is because the nicotine content in cigarettes may cause addictive and calming effects, such as reducing anxiety and restlessness for users. However, if used or smoked continuously, it can lead to emotional disorders, one of which is anxiety.

REFERENCES

Abdullah, A., Alhashim, A., Alghannam, A. A., Almakhayitah, I. H., Ali, A., Alhammadi, Y. M., Alkatali, N. A., Alsaqer, S. K., Ahmed, M., Alzahrani, R. M., & Alessa, J. A. (2025). *Anxiety and Depression among Smoker among University Students : A Systematic Review Journal of Chemical Health Risks*. *15*, 574–582.

Aini, N., Nasution, R. S., Efendy, I., & Fitria, A. (2024). *MAHASISWA DI KAMPUS X ACEH SELATAN Factors Influencing Smoking Behavior In Students at Campus X Aceh Selatan*. *10*(2), 446–460.

Al Mubarok, M., Nadhirah, N. A., & Saripah, I. (2022). General Anxiety Disorder Dalam Intensitas Penggunaan Smartphone Pada Remaja. *Jurnal Bimbingan Konseling Islam*, *4*(2), 139–147.

Asfour, N. M. (2024). Cognitive Deficits in Generalized Anxiety Disorder : Impairments in Attention , Executive Functioning , and Cognitive Flexibility Among Young Adults. *Jurnal of Angiotherapy*, *8*(11), 1–7.

Banushi, B., Brendle, M., Ragnhildstveit, A., Murphy, T., Moore, C., Egberts, J., & Robison, R. (2023). Breathwork Interventions for Adults with Clinically Diagnosed Anxiety Disorders: A Scoping Review. *Brain Sciences*, *13*(2). https://doi.org/10.3390/brainsci13020256

Burke, C., Freeman, T. P., Sallis, H., Wootton, R. E., Burnley, A., Lange, J., Lees, R., Sawyer, K., & Taylor, G. (2023). Associations of cannabis use, tobacco use and incident anxiety, mood, and psychotic disorders: a systematic review and meta-analysis. *MedRxiv*. https://www.embase.com/search/results?subaction=viewrecord&id=L2023737500&from=export%0Ahttp://dx.doi.org/10.1101/2023.03.17.23287299

Byeon, H. (2015). Association among smoking, depression, and anxiety: Findings froma representative sample of Korean adolescents. *PeerJ*, *2015*(10), 1–11. https://doi.org/10.7717/peerj.1288

Bilsky, S. A., Luber, M. J., Cloutier, R. M., Dietch, J. R., Taylor, D. J., & Friedman, H. P. (2021). Cigarette use, anxiety, and insomnia from adolescence to early adulthood: A longitudinal indirect effects test. *Addictive Behaviors*, *120*. https://doi.org/10.1016/j.addbeh.2021.106981

Cahyadi, A. T., & Sulistyaningtyas, N. (2025). *Analysis of Final Semester Students ' Level of Academic Anxiety Disorder Regarding Thesis*. *2020*, 255–258.

Cho, S., Park, J.-H., Kim, D.-H., Choi, H., Park, Y., Kim, H.-J., Lee, A.-N., Shin, J., & Ha, J. (2024). Association between Combustible Cigarettes and Noncombustible Nicotine or Tobacco Products and Generalized Anxiety Disorder Based on Data from the 8th Korea National Health and Nutrition Examination Survey 2021. *Korean Journal of Family Medicine*, 317–323. https://doi.org/10.4082/kjfm.23.0172

Erskine, H. E., Maravilla, J. C., Wado, Y. D., Wahdi, A. E., Loi, V. M., Fine, S. L., Li, M., Ramaiya, A., Wekesah, F. M., Odunga, S. A., Njeri, A., Setyawan, A., Astrini, Y. P., Rachmawati, R., Hoa, D. T. K., Wallis, K., McGrath, C., Shadid, J., Enright, M. E., … Scott, J. G. (2024). Prevalence of adolescent mental disorders in Kenya, Indonesia, and Viet Nam measured by the National Adolescent Mental Health Surveys (NAMHS): a

multi-national cross-sectional study. *The Lancet*, *403*(10437), 1671–1680. https://doi.org/10.1016/S0140-6736(23)02641-7

Fadia, S. H., Shifanidha, Y. T., Hidayat, I., Anggraini, O. D., Fitrianto, W. C., Nabillah, R., Nurahmad, Y. A., Karyadi, V. A., Kirana, K. C., & Pratiwi, B. I. (2023). Peningkatan Pengetahuan Bahaya Merokok dengan Edukasi pada Siswa Sekolah Dasar Negeri 2 Tawang Kabupaten Sukoharjo. *Prosiding Seminar Nasional Kesehatan Masyarakat Universitas Muhammadiyah Surakarta*, 220–229.

Fiana, F. K., & Indarjo, S. (2024). Analisis Faktor-Faktor yang Memengaruhi Kejadian Hipertensi. *HIGEIA (Journal of Public Health Research and Development)*, *8*(1), 1–11. https://doi.org/10.15294/higeia.v8i1.67857

Firdaus, E., Widiyawati, W., Fitrianur, W. L., & Suminar, E. (2024). *The Correlation Between Social Comparison and Depression in Adolescents Aged 12-24 Years in Suci Village , Manyar District , Gresik*. *17*(3), 221–230. https://doi.org/10.23917/jk.v17i3.5414

Fitri, A. (2023). Program Preventif Bunuh Diri Untuk Mengurangi Ide Dan Percobaan Bunuh Diri Pada Mahasiswa. *Journal of Clinical, Industrial, Social and Educational Psychology*, 12–22.

Goodwin, R. D., Lewinsohn, P. M., & Seeley, J. R. (2005). Cigarette smoking and panic attacks among young adults in the community: The role of parental smoking and anxiety disorders. *Biological Psychiatry*, *58*(9), 686–693. https://doi.org/10.1016/j.biopsych.2005.04.042

Hendra Setyoko, K., Puspita, S., & Nuraminudin Aziz, A. (2024). Hubungan Tingkat Stres Dengan Perilaku Merokok Pada Remaja Di Desa Banjargondang Kec. Bluluk, Kab. Lamongan. *Prima Wiyata Health*, *5*(1), 1–10. https://doi.org/10.60050/pwh.v5i1.56

Husna, C., & Jannah, S. R. (2019). Kecemasan Dan Perilaku Merokok Pada Remaja. *Idea Nursing Journal*, *10*(1), 32–36.

Johnson, J. G., Cohen, P., Pine, D. S., Klein, D. F., Kasen, S., & Brook, J. S. (2000). Association between cigarette smoking and anxiety disorders during adolescence and early adulthood. *Journal of the American Medical Association*, *284*(18), 2348–2351. https://doi.org/10.1001/jama.284.18.2348

Kim, N., & Justin Kim, M. (2021). Altered task-evoked corticolimbic responsivity in generalized anxiety disorder. In *International Journal of Molecular Sciences* (Vol. 22, Issue 7). https://doi.org/10.3390/ijms22073630

Laksmiwati, E. D., & Tondok, M. S. (2023). Perceived Social Support, Academic Self-Efficacy, and Anxiety among Final Year Undergraduate Students: A Mediation Analysis. *Bulletin of Counseling and Psychotherapy*, *5*(2), 173–182. https://doi.org/10.51214/00202305514000

Liem, A. (2010). PENGARUH NIKOTIN TERHADAP AKTIVITAS DAN FUNGSI OTAK SERTA HUBUNGANNYA DENGAN GANGGUAN PSIKOLOGIS PADA PECANDU ROKOK. *BULETIN PSIKOLOGI*, *18*(2), 37–50.

Luo, Z., Xu, W., Jiang, S., Zhou, Q., Guan, Y., Li, L., Liu, S., Zhou, H., Yin, X., Wu, Y., & Chen, J. (2023). The mediating role of negative emotions in the relationship between smoking and health-related quality of life among Chinese individuals: A cross-sectional study. *Tobacco Induced Diseases*, *21*(October), 1–12. https://doi.org/10.18332/tid/171355

Ma, R., Zhang, Q., Zhang, C., & Xu, W. (2024). Longitudinal associations between family functioning and generalized anxiety among adolescents: the mediating role of self-

identity and cognitive flexibility. *BMC Psychology*, *12*(1), 1–10. https://doi.org/10.1186/s40359-024-01908-1

Mayah, I. C. (2021). Hubungan Stress dengan Kebiasaan Merokok pada Komunitas Pendaki Indonesia Korwil Yogyakarta. *Jurnal Keperawatan Terpadu (Integrated Nursing Journal)*, *2*(2), 156. https://doi.org/10.32807/jkt.v2i2.83

Mishra, A. K., & Varma, A. R. (2023). A Comprehensive Review of the Generalized Anxiety Disorder. *Cureus*, *15*(9). https://doi.org/10.7759/cureus.46115

Moon, Y., & Woo, H. (2024). Key risk factors of generalized anxiety disorder in adolescents: machine learning study. *Frontiers in Public Health*, *12*(January), 1–9. https://doi.org/10.3389/fpubh.2024.1504739

Moylan, S., Jacka, F. N., Pasco, J. A., & Berk, M. (2012). Cigarette smoking, nicotine dependence and anxiety disorders: A systematic review of population-based, epidemiological studies. *BMC Medicine*, *10*(1), 123. https://doi.org/10.1186/1741-7015-10-123

Mubasyiroh, R., Suryaputri, I. Y., & Tjandrarini, D. H. (2017). Determinan Gejala Mental Emosional Pelajar SMP-SMA di Indonesia Tahun 2015. *Buletin Penelitian Kesehatan*, *45*(2), 103–112. https://doi.org/10.22435/bpk.v45i2.5820.103-112

Nashihuddin, W., Fathoni, L., & Aulianto, D. R. (2015). Manajemen Penerbitan Jurnal Sistem OJS. *Prosiding Lokakarya Nasional Dokinfo PDII-LIPI*, 1–10.

Newman, M. G., Llera, S. J., Erickson, T. M., Przeworski, A., & Castonguay, L. G. (2011). *Canadian Attention Deficit Hyperactivity Disorder Resource Alliance (CADDRA). Differential Diagnosis and Comorbid Disorders. In: Canadian ADHD Practice Guidelines. Third Edition. Toronto: CADDRA*. *Barlow 1988*, 275–297. https://doi.org/10.1146/annurev-clinpsy-050212-185544.Worry

Nurhasanah, T., & Kurnia, S. I. (2023). The Relationship Between Knowledge About The Dangers Of Cigarettes And Smoking Behavior In Junior High School Students. *Jurnal Keperawatan*, *15*(S4), 413–422. http://journal.stikeskendal.ac.id/index.php/Keperawatan

Nurjannah, D., Oktavia Hidayati, N., & Shalahuddin, I. (2023). Gambaran Pengetahuan, Sikap Tentang Rokok, dan Status Perokok pada Siswa Sekolah Menengah Pertama Negeri 1 Tanjungsari Kabupaten Sumedang. *Jurnal Kesehatan*, *16*(3), 213–223. https://doi.org/10.23917/jk.v16i3.2022

Octaviani, P., & Sunarti. (2020). Drug Prescribing Pattern (Generalized Anxiety Disorder) in Banyumas General Hospital. *Advances in Health Sciences Research*, *20*(Icch 2019), 82–85. https://doi.org/10.2991/ahsr.k.200204.019

Pamungkas, K. B., R. Maramis, Franckie. R., & Tucunan, A. A. T. (2020). Perilaku Mahasiswa Terhadap Penerapan Kebijakan Kawasan Tanpa Rokok DI Fakultas Kesehatan Masyarakat Universitas Samratulangi. *Jurnal KESMAS*, *9*(7), 1–8.

Philian Goszal, irene Miracle, H. A. S. M. (2023). Hambatan Yang Dialami Oleh Mahasiswa Dalam Mengelola Kesehatan Mental Selama Pandemi Covid-19. *Jurnal Inovasi Penelitian*, *3*(8), 7307–7316. https://jurnal.umt.ac.id/index.php/jt/article/view/10648

Pinaria, A. S., Manampiring, A. E., & Umboh, A. (2023). Hubungan antara Kebiasan Merokok, Konsumsi Alkohol dan Faktor Sosiodemografis dengan Kualitas Hidup Remaja di Kabupaten Minahasa Utara. *E-CliniC*, *12*(1), 96–106. https://doi.org/10.35790/ecl.v12i1.45748

Santomauro, D. F., Mantilla Herrera, A. M., Shadid, J., Zheng, P., Ashbaugh, C., Pigott, D. M., Abbafati, C., Adolph, C., Amlag, J. O., Aravkin, A. Y., Bang-Jensen, B. L., Bertolacci, G. J., Bloom, S. S., Castellano, R., Castro, E., Chakrabarti, S., Chattopadhyay, J., Cogen, R. M., Collins, J. K., … Ferrari, A. J. (2021). Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. *The Lancet*, *398*(10312), 1700–1712. https://doi.org/10.1016/S0140-6736(21)02143-7

Sebtiana, E., Sudaryanto, A., Kesehatan, F. I., Surakarta, U. M., Merokok, P., & Laki-laki, R. (2025). *Hubungan pengetahuan bahaya merokok dan perilaku merokok siswa 1,2*. *7*(1), 38–45.

Sma, D., Don, K., & Lembean, B. (2024). *Edukasi Tentang Bahaya Merokok Pada Kalangan Remaja*. *5*(2), 2489–2496.

Soen, C. C., Hardjasasmita, I. M., & Ulitua, A. E. (2022). Generalized Anxiety Disorder: Diagnosis and Treatment. *Jurnal Muara Medika Dan Psikologi Klinis*, *1*(2), 133. https://doi.org/10.24912/jmmpk.v1i2.14865

Tan, G. P. P., Teo, O., & van der Eijk, Y. (2022). Residential secondhand smoke in a densely populated urban setting: a qualitative exploration of psychosocial impacts, views and experiences. *BMC Public Health*, *22*(1), 1–11. https://doi.org/10.1186/s12889-022-13561-7

Warsyena, R., & Wibisono. (2021). Insomnia: Suatu Analisis Terhadap Faktor Penyebab, Dampak Dan Penanganannya. *Nusantara Hasana Journal*, *1*(7), 132–137.