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The Impact of Electronic Cigarette on Mental Health Among Adolescents and Young Adults: A Systematic Review

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ABSTRACT

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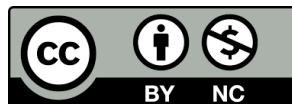
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Background: The use of electronic cigarettes (e-cigarettes) has risen significantly among adolescents and young adults globally. While the physical health risks are increasingly documented, the impact of vaping on mental health in this demographic requires further synthesis of the available evidence. This literature review aims to consolidate scientific evidence about the impact of e-cigarette use on the mental health of adolescents and young adults.

Methods: A systematic literature review was conducted following the PRISMA protocol. Searches were performed in Scopus, PubMed, ProQuest, and Cochrane databases for publications from 2021 to 2025. The search strategy used keywords related to electronic cigarette, mental health, and young populations. After screening, 23 articles met the inclusion criteria for full-text analysis.

Results: E-cigarette use and mental health were found to be significantly correlated negatively in the great majority of the previous studies. The most consistently identified impacts included increased symptoms of depression, anxiety, and psychological stress. Furthermore, e-cigarette was associated with more severe outcomes, including non-suicidal self-injury, suicidal ideation, poor sleep quality, and psychological distress. Longitudinal studies indicated that persistent e-cigarette could predict the future onset of depressive symptoms. These findings were consistent across diverse geographical and cultural contexts.

Conclusion: E-cigarette use is associated with a range of adverse mental health outcomes among adolescents and young adults, from common disorders like depression and anxiety to severe risks such as suicidality. These findings point out the need for targeted public health interventions and international strategies to address the mental health risks of e-cigarette in younger populations.

Keywords: Adolescents; E-cigarette; Mental health; Young adults

INTRODUCTION

The use of electronic cigarettes (e-cigarette) has increased significantly in recent years, especially among adolescents and young adults. According to the World Health Organization (WHO), adolescents describes those in the 10-19 age group, while young adults refers to individuals aged 20-24. However, more broadly the adolescents and young adults population often includes those aged 15-25, acknowledging the transitional aspect of this phase of life (1).

The percentage of e-cigarette use among 18 to 24-year-olds is higher than in other age groups (2). Global tobacco used in 2021 is estimated to reach 82 million, with the highest prevalence among young adults (3). In Southeast Asian countries like Thailand, Malaysia, and Indonesia, the prevalence of e-cigarette used among adolescents and young adults aged 10-24 reaches 3.3% to 11%, reflecting the current trend in e-cigarette use (4).

E-cigarettes are handheld devices that heat a liquid that typically contains nicotine and flavourings. Instead of smoking, e-cigarettes allow users to inhale nicotine as a vapor. E-cigarettes, in general, do not expose users to the same levels of toxins as traditional cigarettes do. Using an e-cigarette is usually referred to as "vaping." (5). E-cigarettes heat liquid nicotine, which has flavours and other ingredients, to produce an inhalable aerosol. The nicotine provides the sensation of smoking without the process of burning tobacco (6). E-cigarettes were initially introduced as a safer alternative to conventional cigarettes and as an option to help people quit smoking (7,8). The perception of minimal risk associated with e-cigarettes leads to higher intensity of e-cigarette use, making it more difficult to quit and more rapidly popular among adolescents and young adults, even those with no prior history of conventional smoking (7,9,10).

E-cigarettes generally contain chemical solvents such as propylene glycol, vegetable glycerin, and nicotine (11). E-cigarettes deliver a very high dose of nicotine, which can increase the risk of addiction even with short-term exposure (12–14). Nicotine exposure during adolescence affects the developing brain, impacting concentration, memory, anxiety, and mood (12). Additionally, nicotine in adolescents has been shown to cause

severe damage to the developing brain, leading to cognitive and mental health problems such as depression, anxiety, substance abuse, and even suicidal thoughts (15). There is extensive research on the negative impact of e-cigarettes on physical health, but relatively little research on their impact on mental health, especially in adolescents and young adults (8). This literature review aims to consolidate scientific evidence about the impact of e-cigarette use on the mental health of adolescents and young adults.

METHODS

Study Design

The literature review was conducted based on four steps by Snyder (16): (a) designing the study, which includes selecting an interesting topic and determining the objectives, scope, and research questions; (b) the review process includes searching for samples using relevant keywords that align with the inclusion criteria, followed by selecting high-quality articles by initially reviewing the title and abstract, then assessing the full text before finalizing them as samples; (c) analysing the samples in alignment with the research objectives; and (d) writing the literature review.

Search Strategy

The data collection process was conducted in September 2025. The data search was systematically carried out using databases and search engines such as Scopus, PubMed, ProQuest, and Cochrane, following the PRISMA protocol guidelines for literature reviews. The literature search focused on relevant publications produced between 2021-2025. Searches of titles and key terms were used to identify related studies. The keywords used in the search strategy combined with Boolean operators AND and OR. See **Table 1** for a complete list of search terms used.

Eligible Criteria

Titles and abstracts were screened independently to determine their relevance to this literature review. Subsequently, the remaining articles were reviewed in full text based on the inclusion and exclusion criteria. The inclusion criteria used to select studies for this literature review were as follows:

1. The respondents were adolescents and young adults (10–30 years old). It can be students, young workers, or the general public. Use of vapes or e-cigarettes is active.
2. There have been impacts on mental psychological health (e.g., anxiety, depression, and addiction).
3. This review includes original research articles, English-language publications, and studies published in the last five years (2021-2025).
4. The articles that were not chosen are duplicated articles and review articles.

Table 1: Keyword Used in Search Strategy

Keyword	Database	Filters	Result
("vaping" OR "e-cigarette" OR "electronic cigarette" OR "vapor") AND ("mental health" OR "psychological well-being" OR "emotional health" OR "cognitive function") AND ("young adult" OR "adolescent" OR "youth" OR "teenager") AND ("impact" OR "effect" OR "influence" OR "consequence")	Scopus	• 5 years • Limited to English	202
	PubMed	• 5 years • Free full text	2
	Proquest	• Scholarly journals • 5 years • Article • English. • Full text	814
	Cochrane	• 5 years • English • Trials	29

Search Flowchart

The search yielded 1,047 articles from three databases: Scopus (202 articles), PubMed (2 articles), ProQuest (814 articles), and Cochrane (29 articles). The initial stage involved identifying and removing duplicate entries (49 articles). Subsequently, 998 articles were screened for relevance to the research objectives by reviewing their titles and abstracts. During this process, 941 articles were excluded for not meeting the inclusion criteria, leaving 57 articles for further evaluation. The next step involved full-text screening of the remaining articles, which led to the exclusion of 34 articles that did not meet the eligibility criteria. Consequently, 23 articles met all the requirements. A critical assessment was conducted to ensure their quality, and these 23 articles were included in the review. For more details, refer to **Figure 1**.

RESULT

Characteristics of Studies

The selected articles were analyzed based on their content, which includes details such as the research title, author's name, publication

year, location/country, research design, method, participant, age, impact, and research findings. A detailed explanation is provided in **Table 2**. Out of 23 articles, the majority reported a negative relationship between e-cigarette and mental health.

Impact of Electronic Cigarette on Mental Health among Adolescents and Young Adults

Most of the reviewed articles reported that the use of electronic cigarettes has a negative impact on the mental health of adolescents and young adults. The most consistently reported impacts are increased symptoms of depression, anxiety, and psychological stress, affecting high school students, university students, and adults across various countries (Thailand, Egypt, United Arab Emirates (UAE) Canada, South Korea, and the United States). Some studies also show more serious consequences, such as Non-Suicidal Self-Injury (NSSI), suicidal ideation, and suicidal risk, particularly in adolescents and vulnerable groups. Additionally, e-cigarette is associated with psychological distress, Post Traumatic Stress Disorder (PTSD), Attention Deficit Hyperactivity Disorder (ADHD), poor sleep quality, and feelings of loneliness, as well as

stigma and changes in self-perception among young users. Stronger longitudinal studies confirm that persistent vape use can predict the onset of future depressive symptoms and internalizing problems, while cross-sectional studies provide a picture of high prevalence and significant associations with mental

disorders. Overall, the available evidence indicates that e-cigarette use is not only associated with physical risks but also leads to serious and diverse psychological impacts, ranging from mild distress to severe mental health outcomes.

Figure 1: PRISMA flow diagram of the literature search process

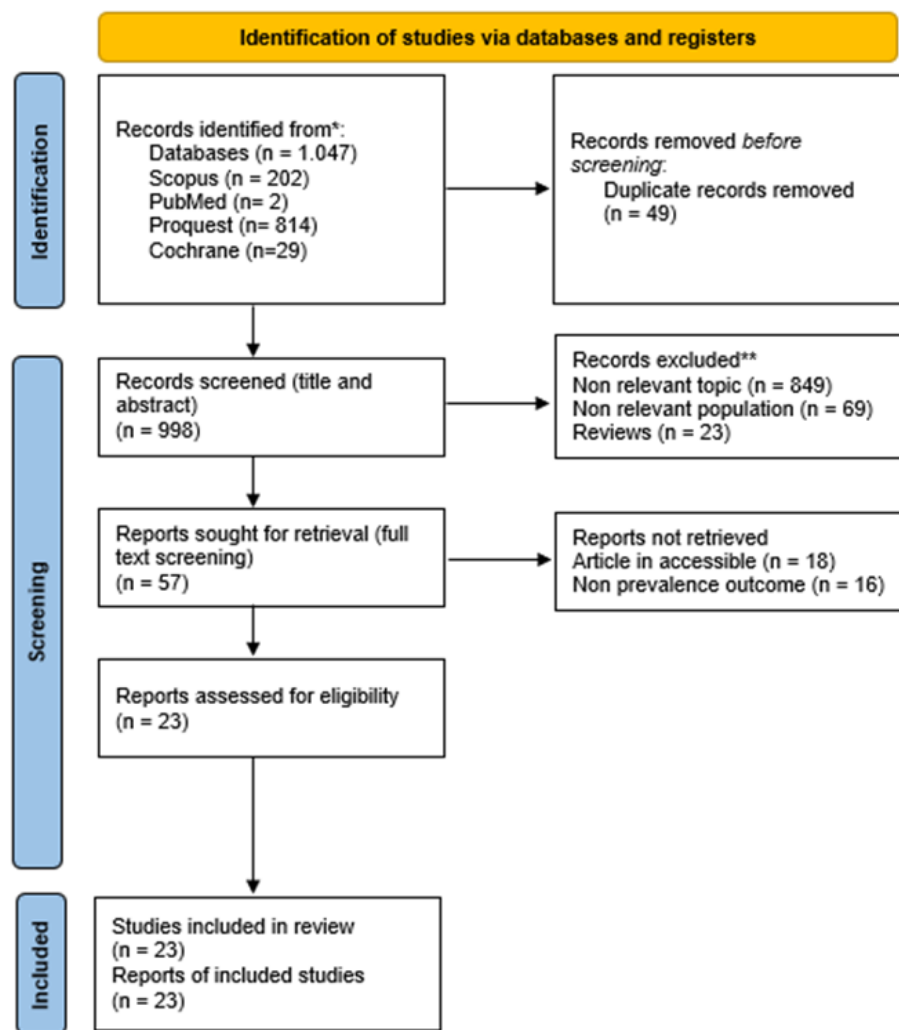


Table 2: Impact of E-Cigarette on Mental Health Among Adolescents and Young Adults

Title	Author/ Year/ Country	Methods	Partici- pants	Age	Impact	Findings
E-Cigarette Use, Systemic Inflammation, and Depression	Farrel et al/2021/USA	A cross-sectional study	4961	18 years and older	Depression	Depression occurred in 16.7% of all e-cigarette users vs. 5.0% of those who never used e-cigarettes (p < 0.001)
Assessment of the Relationship of Depression	Safarini et al/2021/Palestine	A Cross-Sectional Study	1.051	18-24 years	Mental Health, Depression	Revealed the high prevalence of depression and the

With Tobacco and Caffeine Use Among University Students: A Cross-Sectional Study						detrimental effects of smoking on students.
Underlying patterns of the co-occurrence of tobacco use and mental health among youth	Lee et al/2022/USA	Cohort Study	10.082	12-17 years old	Mental Health	The study revealed a bidirectional relationship between tobacco use and internalizing mental health problems among adolescents. Initial internalizing symptoms, such as anxiety and depression, were found to increase the likelihood of initiating tobacco or e-cigarette use. Over time, persistent use further aggravated these mental health conditions, leading to higher levels of psychological distress and depressive symptoms.
Smoking Cessation and Mental Health According to Use of E-cigarettes and Heated Tobacco Products by Korean Adults	Mi Ah Han/2022/ Korea	Cross sectional	9361	19-24 years old	Depression mood and depressive symptoms	Use of e-cigarettes and current use of heated tobacco products by former smokers were both associated with higher prevalence of depressed mood and depressive symptoms.
Passive exposure to e-cigarette emissions is associated with worsened mental health	Farrel et al/2022/ New York	Cohort Study	16173	<18 Aged	Mental Health	Corroboration of this relationship needs further research to explicate directionality and mechanisms underlying this association
Effects of Tobacco vs E-cigarette Use on NSSI & Suicidality Among Chinese Youth: cross – sectional self-report survey study	Wang et al/2023/ China	Cross-sectional (online)	89342 teenagers		CC/EC use, NSSI, suicidal	The study found that dependence on electronic cigarettes (EC) and conventional cigarettes (CC) was significantly associated with a higher risk of non-suicidal self-injury (NSSI) and suicidal behaviors among Chinese adolescents, with

Longitudinal Examination of ENDS Use Among Young Adult College Students: associations with depressive symptoms and sensation seeking	Loukas et al/2023/ USA	Longitudinal (2015–2019)	1298 undergraduate student	18–30 Aged	ENDS use, depression, sensation seeking	sexual and gender minority (SGM) youth identified as the most vulnerable group. The longitudinal study found that higher levels of depressive symptoms and sensation-seeking tendencies among young adult college students were associated with more frequent use of electronic nicotine delivery systems (ENDS), indicating that both emotional distress and personality traits contribute to increased vaping behavior over time. All forms (CC, EC, dual) are related to depression, anxiety, distress, and gambling
Establishing the Association Between Tobacco, E-cigarette and Dual Use and Mental Health Problems	Thepthien et al/2023-2024/ Thailand	Secondary analysis (survey 2022)	5740 high school students	Teenagers	CC, EC, dual use, mental health	
Association of anxiety and depression symptoms with perceived health risk of nicotine vaping products	Trigg et al /2024/ Australia	Cross-sectional survey	General population	+15 Aged	Perception of NVP risk, depression, anxiety	The study revealed that individuals with depressive symptoms tended to have a higher perception of the health risks associated with nicotine vaping products (NVPs), whereas those experiencing anxiety symptoms demonstrated a lower perception of such risks
Immigration status-related exclusive e-cigarette and cannabis use and dual use disparities	Adzrago et al/2024/ USA	Cross-sectional	4766 adults	>18 Aged	E-cigarette, cannabis, mental health	Dual use is higher among US-born individuals; immigrants have lower rates; anxiety and depression are higher among dual users.
Relationship between e-cigarette use, dual smoking habits, and psychological distress among youth in	Phetphum et al/2024/ Thailand	Cross-sectional survey	3424 teenagers	15–24 Aged	E-cigarette, dual use, distress	The study demonstrated that the use of e-cigarettes and dual smoking (both electronic and conventional cigarettes) was

Northern Thailand							significantly associated with higher levels of depression, anxiety, and psychological distress among Thai youth aged 15–24 years, while the use of traditional cigarettes alone showed no significant relationship with mental health outcomes.
Prospective longitudinal relations among frequent social media use, nicotine vaping and mental health problems	Lee et al/2024/ USA	Longitudinal (PATH 2014–2019)	4627 teenagers	12–14 Aged	Social media, vaping, mental health		The longitudinal study found that frequent social media use and nicotine vaping were both predictive of worsening mental health among adolescents aged 12–14 years, contributing to increased internalizing problems such as anxiety, depression, and emotional distress over time
Heated Tobacco Product Use and Mental Health and Nutrition Examination Survey (2018–2020)	Seo et al/2024/ South Korea	Cross-sectional	18,231 respondents	≥19 Aged	HTP use, mental health		HTP user higher risk of stress, depression, suicidal ideation
Personality Risk Factors for Vape Use amongst young adults & its Consequences for Sleep & Mental Health	Evans et al/2024/ UK	Cross-sectional	316 undergraduate students	18–25 Aged	Personality, vaping, mental health		Vaperhigher anxiety, rumination; poor sleep quality
Association of ever use of e-cigarettes with health and lifestyle variables among young adults: a canadian health measure survey study	To et al/2024/ Canada	Cross-sectional (CHMS 2016–17)	905 young adults	15–30 Aged	EC use, stress, QOL		EC users more physically active, but more stressed and lower QOL
Lived experiences of stigma and altered self-perceptions among young people addicted to ENDS: a	DeMello et al/2024/ New Zealand	Qualitative (in-depth interviews)	20 ENDS-addicted teenagers	16–18 Aged	Stigma, distress, self-perception		ENDS addiction, stigma, self-blame, regret, distress

qualitative study from Aotearoa New Zealand						
Use of Cigarettes and E-Cigarettes, Impulsivity, and Anxiety: Influences on Suicidal Ideation Among Youth and Young Adults in Texas	Wilkinson et al/2025/ Texas	Longitudinal Surveillance	2329	16- 23 year olds	Impulsivity, and anxiety on suicidal ideation	Cigarette/e-cigarette use, as well as impulsivity and anxiety, directly increase the risk of suicidal ideation.
Association between depression, anxiety, stress, and vaping among university students in Egypt	Amani/2025/ Qatar	Cross-sectional survey	976 undergraduate students	17–22 Aged	Vaping, depression, anxiety, stress	Daily vaping was significantly linked to stress (OR=2.56; 95% CI: 1.97–3.31), anxiety (OR=8.32; 95% CI: 6.15–11.2), and depression (OR=6.70; 95% CI: 5.1–8.88).
Vaping transitions and incident depressive symptoms among young adults: a marginal structural model analysis	Harlow et al /2025/ USA	Prospective cohort	1806 young adult	Mean 19.5 Aged	Vaping, depression	Non-use & quitting vaping → lower risk of depression compared to continued use
E-cigarette usage and mental health among undergraduate medical and health sciences students	Ibrahim et al/2025/ UEA	Cross-sectional correlational	320 undergraduate students	18–25 Aged	Vaping, depression, anxiety, PTSD, ADHD	Vaping is significantly associated with depression, anxiety, PTSD, and ADHD
Use of Electronic and Conventional Cigarettes and Self-Rated Mental Health in High School Students	Sheikhattari et al/2025/ USA (Baltimore)	Cross-sectional survey	High school student	Teenager	EC/CC use, self-rated mental health	The study reported no significant relationship between the use of electronic or conventional cigarettes and self-rated mental health among high school students after controlling for demographic variables such as age, gender, socioeconomic status, and prior smoking behavior.
Loneliness among emerging adults in rural reservation-based communities: longitudinal effects of 12th grade substance use and mental health symptoms	Barry et al/2025/ USA (AI communities)	Longitudinal survey	483 emerging adults	18–25 Aged	Vaping, depression, anxiety, loneliness	Vaping nicotine/cannabis and symptoms of depression/anxiety predict post-high school loneliness

E-cigarette usage and mental health among undergraduate medical and health sciences students	Ibrahim et al/2025/ United Arab Emirates	A cross-sectional study	320	18 Aged	Mental Health (Depression and ADHD)	These correlations suggest that while vaping is associated with these mental health conditions, the strength of these relationships varies. The moderate correlation with PTSD indicates a more substantial link compared to the weaker associations found with depression and ADHD, highlighting the need for further research into causality and underlying mechanisms.
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DISCUSSION

The study reported the significant impact of the use of e-cigarettes to various mental health disorders, particularly among adolescents and young adults. Most of the studies in this review (17–22) found that e-cigarette is significantly associated with increased symptoms of depression, anxiety, stress, and other psychological disorders. Research Farrel, in the United States showed that 16.7% of e-cigarette users experienced depression, compared to only 5% of non-users (18). Similar results were found among Palestinian students by Safarini, confirming that smoking habits, including e-cigarettes, have a significant impact on students' mental health (23). In Korea, Han reported that the use of e-cigarettes and heated tobacco products increases the risk of depressive symptoms and poor mood.

Besides depression and anxiety, some studies show the presence of psychological distress, sleep disorders, PTSD, and ADHD among young users (19). In United Arab Emirates, found a strong relationship between e-cigarette and depression, anxiety, PTSD, and ADHD. Meanwhile (20), and also in UK highlighted that vape users tend to experience high anxiety and poor sleep quality (24). Research by Barry in United States also added that using substances like vapes in late adolescence can increase feelings of loneliness in young adulthood, demonstrating that the effects of e-cigarette are not only immediate but also long-term (25). The result is in line

with research by VanFrank moderate to severe symptoms of depression and anxiety are common among youth who use e-cigarettes. Youth with these symptoms may need additional support to prevent or quit e-cigarette use (26). This review shows that e-cigarette use not only affects physical health but also impacts mental and emotional well-being.

The psychological impact of e-cigarette use does not stop at mild stress or depression but also includes more severe and high-risk mental consequences. In China it was reported that adolescent e-cigarette users had a higher risk of non-suicidal self-injury (NSSI) as well as suicidal ideation and attempts compared to non-users (27). Also research by Lee in Korea reinforces these findings, showing that users of Heated Tobacco Products (HTPs) have a higher prevalence of clinical depression and suicidal ideation (21). This review's findings align with the research by Javed (8), which indicated that suicide attempts were significantly more prevalent among e-cigarette users than non-users. The utilization of e-cigarettes has been associated with depression, suicidal ideation, and suicide attempts. Suicide attempts were markedly more prevalent among e-cigarette users compared to non-users. It is essential to promote awareness regarding the relationship between electronic cigarettes and the mental health of young adults. Both articles share a key similarity in highlighting the serious impact of e-cigarette use on mental health, particularly the increased risk of depression,

suicidal ideation, and suicide attempts. Therefore, it is crucial to raise public awareness about the link between e-cigarettes and mental health in adolescents and young adults.

Longitudinal evidence from several studies strengthens the possibility of a causal relationship between e-cigarette and the onset of mental disorders. Research by Lee (21) revealed that continuous e-cigarette can predict the future onset of depression and anxiety, while found that transitioning from non-user to active use significantly increases the risk of depression. Harlow (32) also reported that the intensity of vape use was correlated with worsening internalizing symptoms such as anxiety and depression among college students. Additionally, some more complex psychological effects were also identified. Graham-DeMello (28) using a qualitative approach, found that adolescent vape users often experience social stigma, guilt, and distorted self-perception, which exacerbates their psychological stress in New Zealand. In Australia added that higher perceived risk of e-cigarette is associated with increased levels of depression, while anxiety actually lowers perceived risk, indicating a complex reciprocal relationship between risk perception and users' emotional state. Thus, it can be concluded that the use of e-cigarettes not only increases the risk of mild psychological disorders but also potentially triggers self-harming behaviour, suicidal ideation, and other severe mental disorders, especially in vulnerable young age groups.

Consistent research findings from various countries indicate that the negative impact of e-cigarette on mental health is a global phenomenon, not limited to specific regions. Various cross-continental studies, ranging from Thailand (29), Egypt (17), the United Arab Emirates (20), South Korea (30), China (27), Canada (31), and the United States (21,32,33), have shown similar results: E-cigarette use is significantly associated with mental disorders such as depression, anxiety, stress, and risky behaviours.

Studies in Thailand (34) found that all forms of tobacco use—conventional cigarettes, e-cigarettes, and dual use were strongly associated with depression, anxiety, psychological distress, and addictive behaviours like gambling. In Canada, To et al. (31) reported that e-cigarette users had higher stress levels and lower quality of life

compared to non-users, despite appearing more physically active. Research in Egypt and Qatar, Elbarazi et al., 2025 also confirms that daily vape use is strongly associated with depression, anxiety, and stress, indicating a significant psychological burden among young students (17).

Despite the consistent findings across multiple studies and countries, several limitations should be acknowledged. The studies used different assessment instruments and diagnostic criteria to measure depression, anxiety, and stress, making it difficult to directly compare results or ensure consistency in definitions. Most of the studies reviewed were cross-sectional, which limits the ability to establish a clear cause-and-effect relationship between e-cigarette use and mental health outcomes.

This cross-cultural and cross-regional consistency in results reinforces the belief that the phenomenon of e-cigarette impact on mental health is a global issue requiring cross-country attention. Factors such as the accessibility of vape products, the perception of safety among adolescents, and the lack of regulation and public education have also accelerated the spread of its impact worldwide. Therefore, the prevention and management of the psychological effects of e-cigarette, particularly on young people, require international collaborative strategies.

LIMITATION AND RECOMMENDATIONS

This systematic review should acknowledge several limitations. The measurement tools employed to evaluate mental health variables, including depression, anxiety, stress, psychological distress, and sleep quality, exhibited considerable heterogeneity. Different diagnostic instruments, self-report questionnaires, and cut-off scores across studies made direct comparison and synthesis of findings challenging. Most studies relied on self-reported data regarding vaping behaviour and mental health status, which introduced the risks of recall bias and social desirability bias. This may have led to the underreporting or overreporting of both exposures and outcomes.

The findings of this review suggest several recommendations for research, practice, and policy. Future studies should prioritise longitudinal and experimental designs to better establish causal pathways between e-

cigarette use and mental health disorders. There is also a need for standardised and validated mental health measurement instruments across studies to improve comparability. Healthcare professionals, particularly nurses who work with adolescents and young adults, should include screenings for vaping behaviours when assessing mental health. Mental health assessments should also consider vaping as a potential contributing factor to psychological distress, depression, anxiety, and sleep disturbances. Preventive counselling and early interventions targeting vaping behaviours should be integrated into adolescent and young adult healthcare services. Public health campaigns should emphasise not only the physical risks of e-cigarettes, but also their psychological and mental health consequences. We urgently need stronger regulations regarding marketing, accessibility, and flavoured vape products targeted at young people. Schools and universities should implement educational programmes that raise awareness about the mental health risks associated with vaping.

CONCLUSION

The use of e-cigarettes, among teenagers and young adults, is strongly and persistently linked to negative mental health outcomes, according to a thorough evaluation of the evidence. e-cigarettes are strongly associated with increased risk for psychological stress, depression, anxiety, and poor sleep quality. It is also linked to more serious outcomes, such as stigmatization, suicidal thoughts, and non-suicidal self-harm. Persistent e-cigarette usage can predict the onset and exacerbation of internalizing symptoms over time, confirming that they are more than just correlations. In order to lessen this increasing threat to the psychological health of the next generation, targeted public health interventions, stronger regulations, and improved education are desperately needed. This detrimental effect is a widespread worldwide phenomenon that is remarkably consistent across various nations and cultures.

CONFLICTS OF INTEREST

The author declares no conflict of interest.

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AUTHOR CONTRIBUTIONS

N: Conceptualization, data extraction, critical analysis, writing review & editing, writing original draft, and reference management.

LLU: Literature search, review structure, methodology and data extraction, critical analysis, writing review and writing –original draft.

SMSE: Writing–review and editing, final checking, and proofreading quality assurance.

REFERENCES

1. WHO. Adolescent and young adult health [Internet]. 2024. Available from: <https://www.knowledge-action-portal.com/en/content/adolescent-and-young-adult-health>
2. CDC U. E-Cigarette Use Among Adults [Internet]. US; 2024. Available from: <https://www.cdc.gov/tobacco/e-cigarettes/adults.html>
3. Stimson G V. Estimation of the global number of vapers: 82 million worldwide in 2021. 2025;24(2):91–103.
4. Jane Ling MY, Abdul Halim AFN, Ahmad D, Ahmad N, Safian N, Mohammed Nawi A. Prevalence and Associated Factors of E-Cigarette Use among Adolescents in Southeast Asia: A Systematic Review. *Int J Environ Res Public Health*. 2023 Feb;20(5).
5. Lindson N, Butler AR, McRobbie H, Bullen C, Hajek P, Wu AD, et al. Electronic cigarettes for smoking cessation. *Cochrane database Syst Rev*. 2025 Jan;1(1):CD010216.
6. Munisah S, Shoaib M, Ahmad N. Prevalence and determinants of e-cigarette use among vocational college students: A cross-sectional study. *PLoS One* [Internet]. 2025;1–14. Available from: <https://doi.org/10.1371/journal.pone.0311585>
7. Gostin LO, Glasner AY. E-cigarettes, vaping, and youth. *JAMA*. 2014 Aug;312(6):595–6.
8. Javed S, Usmani S, Sarfraz Z, Sarfraz A, Hanif A. Journal of Community Hospital Internal Medicine Perspectives A Scoping Review of Vaping , E-Cigarettes and Mental Health Impact: Depression and Suicidality A Scoping Review of Vaping ,

- E-Cigarettes and Mental Health Impact: Depression. *J Community Hosp Intern Med Perspect*. 2022;12(3):33–9.
9. Jenssen BP, Boykan R. Electronic Cigarettes and Youth in the United States: A Call to Action (at the Local, National and Global Levels). *Child* (Basel, Switzerland). 2019 Feb;6(2).
10. Vogel EA, Cho J, McConnell RS, Barrington-Trimis JL, Leventhal AM. Prevalence of Electronic Cigarette Dependence Among Youth and Its Association With Future Use. *JAMA Netw open*. 2020 Feb;3(2):e1921513.
11. Marynak KL, Cohen JE, Thrul J, Kennedy RD, Limaye R, Moran MB. Effects of E-Cigarette Warning Labels About Mental Health Consequences of Nicotine Addiction Among Young Adults in the USA: Results From a Randomized Controlled Experiment. *Nicotine Tob Res* [Internet]. 2025;27(6):1006–15. Available from: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-105005883799&doi=10.1093%2Fntae298&partnerID=40&md5=3368148951f4005703fb8d06a8b4163b>
12. Service PH. £ -Cigarette Use Among Youth and Young Adults A Report of the Surgeon General E-Cigarette Use Among Youth and Young Adults: A Report of the Surgeon General. 2016.
13. Vogel EA, Prochaska JJ, Ramo DE, Andres J, Rubinstein ML. Adolescents' E-Cigarette Use: Increases in Frequency, Dependence, and Nicotine Exposure Over 12 Months. *J Adolesc Heal Off Publ Soc Adolesc Med*. 2019 Jun;64(6):770–5.
14. Yuan M, Cross SJ, Loughlin SE, Leslie FM. Nicotine and the adolescent brain. *J Physiol*. 2015 Aug;593(16):3397–412.
15. Demissie Z, Everett Jones S, Clayton HB, King BA. Adolescent Risk Behaviors and Use of Electronic Vapor Products and Cigarettes. *Pediatrics*. 2017 Feb;139(2).
16. Snyder H. Literature review as a research methodology: An overview and guidelines. *J Bus Res*. 2019;104:333–9.
17. Elbarazi A. Association between depression , anxiety , stress , and vaping among university students in Egypt. *Popul Medinice*. 2025;3:1–7.
18. Farrell KR, Karey E, Xu S, Gibbon G, Gordon T, Weitzman M. E-Cigarette Use, Systemic Inflammation, and Depression. *Int J Environmental Res Public Heal*. 2021;18:1–13.
19. Han MA. Smoking Cessation and Mental Health According to Use of E - cigarettes and Heated Tobacco Products by Korean. *Int J Ment Health Addict* [Internet]. 2022;2559–70. Available from: <https://doi.org/10.1007/s11469-021-00698-6>
20. Ibrahim FM, Shahrour G, Hashim A, Yasin A, Allam AR. E-cigarette usage and mental health among undergraduate medical and health sciences students. *Nature*. 2025;15:1–9.
21. Lee B, Levy D, Seo DC. Underlying patterns of the co-occurrence of tobacco use and mental health among youth. *J Behav Med*. 2023 Aug;46(4):668–79.
22. Phetphum C, Keeratisiroj O, Prajongjeep A. Perception of e-cigarette control policies and education in schools on increased legal knowledge, harm perception, susceptibility and e-cigarette use among students in Thailand: A cross-sectional classroom-based survey. *Tob Induc Dis* [Internet]. 2024;22(May). Available from: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85195885163&doi=10.18332%2Ftid%2F187840&partnerID=40&md5=d3f825256a2eef26216acbe0ad583ae6>
23. Safarini OA, Taya H, Abu Elhija Y, Qadous M, Farhoud A, Thabaleh A, et al. Assessment of the Relationship of Depression With Tobacco and Caffeine Use Among University Students: A Cross-Sectional Study. *Cureus*. 2021 Oct;13(10):e19098.
24. Evans SL, Alkan E. Personality Risk Factors for Vape Use amongst Young Adults and Its Consequences for Sleep and Mental Health. *Healthc* (Basel, Switzerland). 2024 Feb;12(4).
25. Barry CM, Jagtiani A, Skinner JR, Gassaway AN, Komro KA, Livingston MD. Loneliness among emerging adults in rural reservation-based communities: longitudinal effects of 12th grade substance use and mental health symptoms. *Nature*. 2025;15:1–8.
26. VanFrank B, Williams TR, Alcantara IC, Hertz M, Al-Shawaf M, Meyers C, et al. E-Cigarette Use and Symptoms of Depression and Anxiety Among US Middle and High School Students. *Prev Chronic Dis*. 2025 Aug;22:E51.
27. Wang Y, Xu S, Zhang X, Zhang Y, Feng Y, Wang Y, et al. Effects of Tobacco Versus Electronic Cigarette Usage on Nonsuicidal Self-Injury and Suicidality Among Chinese Youth: Cross-Sectional

- Self-Report Survey Study. *JMIR Public Heal Surveill* [Internet]. 2023;9. Available from: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85164251422&doi=10.2196%2F47058&partnerID=40&md5=20ca6104a52b82dbe75fa6e95cc74878>
28. Graham-DeMello A, Sanders C, Hosking R, Teddy L, Ball J, Gallopel-Morvan K, et al. Lived experiences of stigma and altered self-perceptions among young people who are addicted to ENDS: a qualitative study from Aotearoa New Zealand. *Tob Control* [Internet]. 2024; Available from: <https://tobaccocontrol.bmj.com/content/early/2025/01/19/tc-2024-058946>
 29. Phetphum C, Prajongjeep A, Phuengnam K. Relationship between electronic cigarette use, dual smoking habits, and psychological distress among youth in Northern Thailand: A cross-sectional study. *Tob Induc Dis* [Internet]. 2024;22. Available from: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85194363358&doi=10.18332%2Ftid%2F186860&partnerID=40&md5=f76e7d7ca6047d2f366673d1a3f6015e>
 30. Seo Y gyun, Lee S, Lim MK, Paek Y jin. Heated Tobacco Product Use and Mental Health: Korean National Health and Nutrition Examination Survey. *Int J Ment Health Addict*. 2024;22:979–94.
 31. To T, Borkhoff CM, Chow CW, Moraes TJ, Schwartz R, Vozoris N, et al. Association of ever use of e-cigarettes with health and lifestyle variables among young adults: a Canadian health measure survey study. *Eur J Pediatr*. 2024 Jun;183(6):2521–6.
 32. Harlow AF. Vaping transitions and incident depressive symptoms among young adults: a marginal structural model analysis. 2025;746–54.
 33. Sheikhattari P, Ara R, Barsha A, Egboluche C. Use of Electronic and Conventional Cigarettes and Self-Rated Mental Health in High School Students. 2025;1:1–12.
 34. Thepthien B on, Tinn CS, Sharma R. Establishing the Association Between Traditional Tobacco , E - cigarette and Dual Use and Mental Health Problems Among High School Students: Results from a 2022 Behavioral Surveillance Survey. *Int J Ment Health Addict* [Internet]. 2024;22(6):4148–68. Available from: <https://doi.org/10.1007/s11469-023-01109-8>