

Mental Health Issues among Malaysian Adolescents: Prevalence, Trends, and Ecopharmacovigilance Considerations of Psychiatric Medication Use — A Qualitative Systematic Review

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DOI: <https://doi.org/10.47772/IJRISS.2026.100400418>

Received: 16 April 2026; Accepted: 23 April 2026; Published: 13 May 2026

ABSTRACT

Mental health issues among adolescents represent a significant and growing public health burden in Malaysia, with escalating rates of depression, anxiety, and stress recorded over the past decade. The widespread diagnosis and pharmacological management of these conditions has led to substantially increased consumption of psychotropic medications — including antidepressants, anxiolytics, and antipsychotics — with implications extending beyond clinical settings into the broader environment. This qualitative systematic review synthesises evidence on the prevalence, types, trends, and contributing factors of mental health disorders among Malaysian adolescents from 2014 to 2024, drawing on 19 peer-reviewed studies identified through Scopus, PubMed, and Google Scholar. Findings reveal a marked escalation in the prevalence of depression (8.85% to 34.84%), anxiety (10% to 57.68%), and stress across all reviewed intervals, peaking during the COVID-19 pandemic period (2020-2022). From an ecopharmacovigilance perspective, the rising psychotropic drug burden associated with this epidemiological trend raises important concerns regarding pharmaceutical residues in wastewater and aquatic ecosystems. This review highlights the need for integrated surveillance strategies that address both the clinical and environmental dimensions of adolescent psychiatric pharmacotherapy in Malaysia.

Keywords: Mental health, Adolescents, Malaysia, Psychiatric medication, Ecopharmacovigilance, Psychotropic drugs, Qualitative Systematic review

INTRODUCTION

Mental health is a crucial aspect of overall well-being, influencing how individuals manage stress, relate to others, and make decisions throughout their lives (CDC, 2024). It is particularly important during adolescence — a formative period marked by significant physical, emotional, and social changes. Mental health issues, encompassing a range of disorders characterised by changes in mood, behaviour, and thinking, can severely impact adolescents' quality of life, academic performance, and social interactions (American Psychiatric Association, 2022).

Globally, not less than 13% of adolescents are affected by mental disorders, with anxiety and depressive disorders comprising approximately 40% of all such conditions. In 2019, around 970 million people — including

adolescents — were living with mental disorders; this figure increased by 25% during the early COVID-19 pandemic in 2020, primarily driven by surges in anxiety and depression (WHO, 2024). Beyond these, adolescents also suffer from bipolar disorder, schizophrenia, eating disorders, obsessive-compulsive disorder (OCD), and post-traumatic stress disorder (Holland, 2023).

Mental Health in Malaysia

Malaysia, a multiracial developing nation in Southeast Asia, has undertaken considerable policy reforms to improve mental health services. Despite these efforts, challenges persist in delivering affordable and accessible mental healthcare. According to the Ministry of Health Malaysia (MOH), the prevalence rate of mental disorder among adults reached 29% — a 10% increase from 1996 rates (Shaeraine Raaj, 2021). The National Health and Morbidity Survey (NHMS) 2017 found the prevalence of suicidal behaviour among Malaysian adolescents was 10%, with 13-year-old students at highest risk (Shaeraine Raaj, 2021). The increasing burden has translated into an estimated economic cost of RM4.46 billion in 2018 (Shaeraine Raaj, 2021).

Mental Health Among Malaysian Adolescents

Adolescence (ages 10-19) is a period of significant developmental change and heightened vulnerability to mental health issues (WHO, 2020). In Malaysia, the average age for the onset of mental health problems is approximately 14 years (Sahril et al., 2019), with adolescents aged 15 to 18 years constituting 77.9% of those at risk in the 15-to-24 cohort (Nasir et al., 2023). Contributing factors include parental issues, peer pressure, academic stress, physical appearance concerns, substance abuse, and genetic predispositions. Gender differences are notable: females are more susceptible to severe depression than males, partly attributed to earlier onset of puberty and associated hormonal changes (Eisenstadt, 2022). Social media exacerbates these issues through social comparison, diminished self-esteem, and heightened anxiety.

Societal Stigma and Public Perception

Despite growing recognition of mental health as a critical public health issue, Malaysia continues to grapple with deeply entrenched societal stigma (Sarbhan Singh et al., 2022). This stigma discourages help-seeking behaviour and prolongs recovery (Choo, 2020). Misleading media portrayals further reinforce misconceptions. Collaborative anti-stigma initiatives involving schools, the Ministry of Health, and mass media have been proposed as key interventions (Sheri, 2015).

Ecopharmacovigilance Perspective

Ecopharmacovigilance (EPV) is an emerging discipline focused on monitoring and minimising the adverse effects of pharmaceutical substances — particularly their residues — on the natural environment, including aquatic ecosystems, soil, and wildlife (Bound & Voulvoulis, 2005). While traditional pharmacovigilance concerns drug safety in humans, EPV extends this surveillance to the post-excretion fate of drugs in the environment. Psychotropic medications, including selective serotonin reuptake inhibitors (SSRIs), benzodiazepines, and antipsychotics, are among the most frequently detected pharmaceutical contaminants in surface waters and wastewater effluents worldwide (Fent et al., 2006; Kummerer, 2010).

The direct connection between rising adolescent mental health disorders in Malaysia and ecopharmacovigilance concerns lies in the consequent escalation of psychotropic drug prescriptions. As more adolescents are diagnosed with depression, anxiety, and related disorders, the volume of psychiatric medications dispensed increases, inevitably raising the pharmaceutical load entering aquatic and terrestrial environments through inadequate wastewater treatment and improper drug disposal. The environmental persistence and endocrine-disrupting potential of many psychoactive substances — particularly SSRIs — has been documented in fish and other non-target organisms (Brooks et al., 2003; Christensen et al., 2007). In Malaysia, where monitoring of pharmaceutical residues in environmental matrices remains nascent, understanding the upstream epidemiological drivers of psychotropic drug consumption is essential to developing effective EPV frameworks.

This qualitative systematic review aims to examine the prevalence, types, trends, and factors associated with mental health issues among adolescents in Malaysia from 2014 to 2024, while contextualising these findings

within the emerging discourse on ecopharmacovigilance and the environmental implications of psychiatric medication use.

MATERIALS AND METHOD

Study Design and Setting

This study employed a qualitative systematic review design, integrating case study and longitudinal research approaches. Case studies were used to conduct in-depth investigations through analysis and observation, while the longitudinal design allowed examination of how mental health trends developed over time from 2014 to 2024. The review focused on existing peer-reviewed literature, synthesising published findings to generate a comprehensive overview of adolescent mental health in Malaysia.

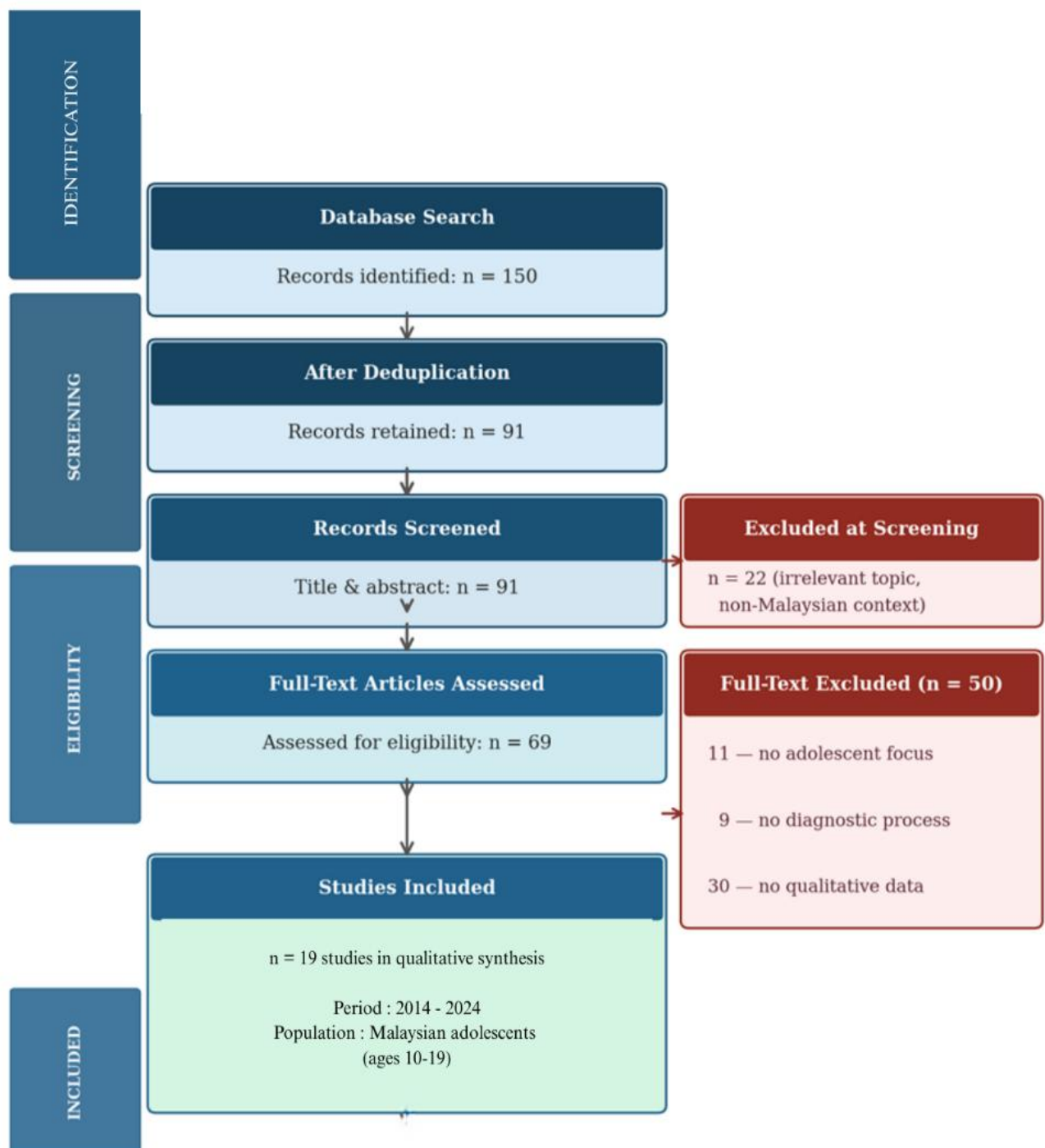


Figure 1. PRISMA flow diagram illustrating the systematic literature search and study selection process (2014–2024)

Data Collection

Literature was identified through three major academic databases: Scopus, PubMed, and Google Scholar. Search terms included combinations of 'mental health', 'adolescents', 'Malaysia', 'depression', 'anxiety', 'stress', 'suicidal ideation', and 'prevalence'. Results were classified by year of publication to facilitate trend analysis, with emphasis on studies published from 2014 onwards to ensure currency and relevance.

A total of 150 records were initially identified. After removal of 59 duplicates, 91 records were screened based on title and abstract. Of these, 22 were excluded at the screening stage. The remaining 69 full-text articles were assessed for eligibility, of which 50 were excluded: 11 did not specifically mention adolescent populations, 9 did not employ a diagnostic process, and 30 lacked qualitative components. Ultimately, 19 articles were included in the qualitative synthesis.

Inclusion and Exclusion Criteria

Inclusion criteria were: (1) studies conducted in Malaysia; (2) participants aged 10-19 years, consistent with the WHO definition of adolescence; (3) studies reporting prevalence, types, trends, or contributing factors of mental health disorders; (4) peer-reviewed publications from 2014 to 2024; and (5) studies employing validated instruments for mental health assessment. Studies were excluded if they focused solely on adult populations, were not conducted in Malaysia, or lacked quantifiable mental health outcome data.

Data Analysis

Data extracted from included studies were synthesised qualitatively, given the heterogeneity of measurement instruments and reporting formats across studies. Prevalence rates were tabulated across four time intervals: 2014-2016, 2017-2019, 2020-2022, and 2023-2024. Trends in case numbers and prevalence percentages were analysed descriptively. Factors influencing mental health were categorised thematically and mapped against corresponding time periods. An additional layer of interpretation was applied to contextualise findings within the ecopharmacovigilance framework, linking observed increases in psychiatric medication demand with potential environmental pharmaceutical burdens.

RESULTS AND DISCUSSION

Number of Cases by Mental Health Issue (2014-2024)

Over the study period, a marked increase in both the prevalence and diversity of reported mental health disorders was observed among Malaysian adolescents. From 2014 to 2016, four eligible journals focused on adolescents reported a combined total of 500 cases across 3,647 respondents. Depression was reported in 2 journals (51 cases), anxiety in 1 journal (19 cases), and stress in 1 journal (18 cases). Suicidal ideation was documented with 138 cases, raising early concern about this severe outcome (Ibrahim et al., 2014).

The 2017-2019 period recorded a dramatic surge, with four journals reporting 10,405 cases from 25,330 respondents. Depression dominated, appearing in all four journals with 8,825 cases. Anxiety was reported in one journal (1,719 cases) and stress in another (1,105 cases). Studies were conducted in Selangor, Klang Valley, and nationally (Abdul Latiff et al., 2017).

During 2020-2022, nine eligible journals reported 11,905 cases from 16,463 respondents. Depression appeared in 5 journals (2,567 cases); anxiety in 3 journals (3,733 cases); suicidal ideation in 2 journals (1,201 cases); and stress in 2 journals (1,029 cases). Psychological distress was reported in 1 journal (3,383 cases), and self-esteem issues in 3 journals (762 cases). Studies spanned Kuala Lumpur, Penang, Klang Valley, and national samples (Sangaran et al., 2022; Sabramani et al., 2021).

Figure 2. Total Reported Cases of Mental Health Issues Among Malaysian Adolescents by Year (2014-2024)

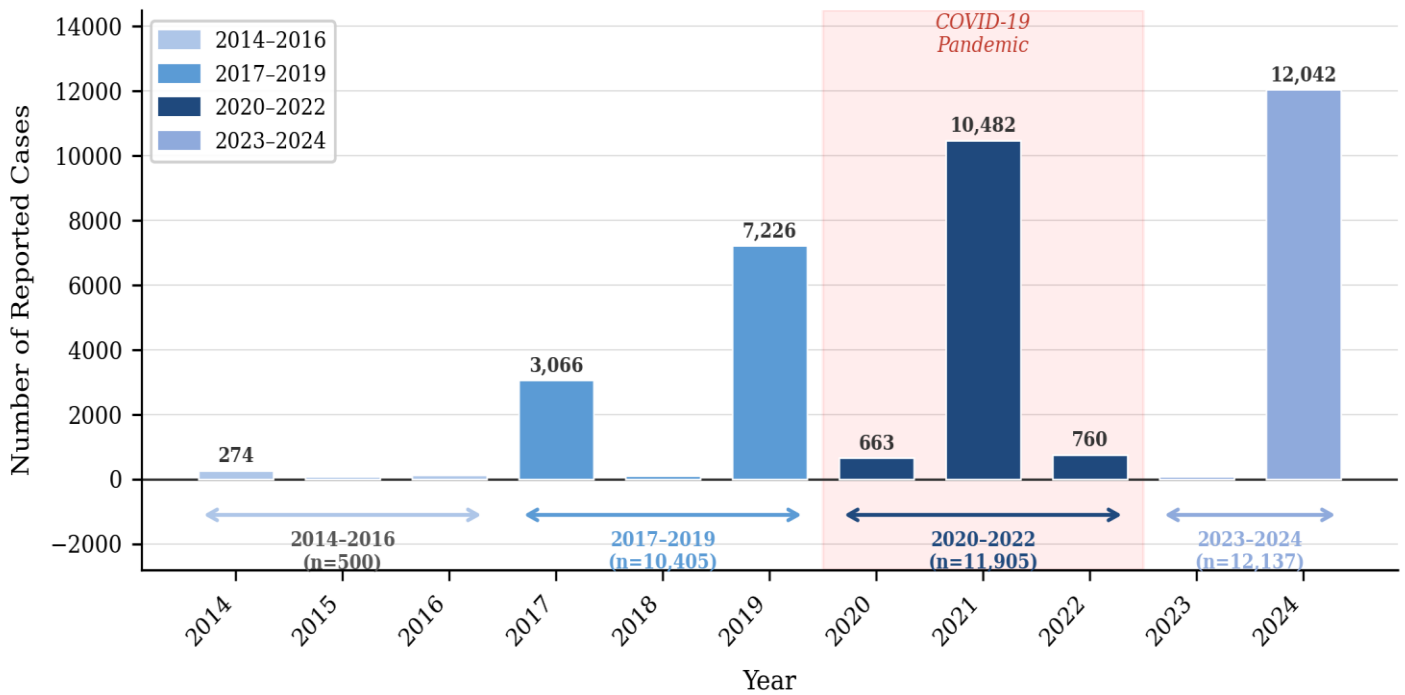


Figure 2. Total reported cases of mental health issues among Malaysian adolescents by year (2014–2024). Shaded region indicates the COVID-19 pandemic period.

In 2023-2024, two journals reported 12,137 cases from 21,167 respondents. Both studies concurrently reported on depression (4,045 cases), anxiety (4,050 cases), and stress (4,042 cases), suggesting evolving diagnostic practices and increased multi-disorder screening (Samsudin et al., 2024).

Figure 3. Number of Reported Cases by Mental Health Issue Across Four Study Intervals (2014-2024)

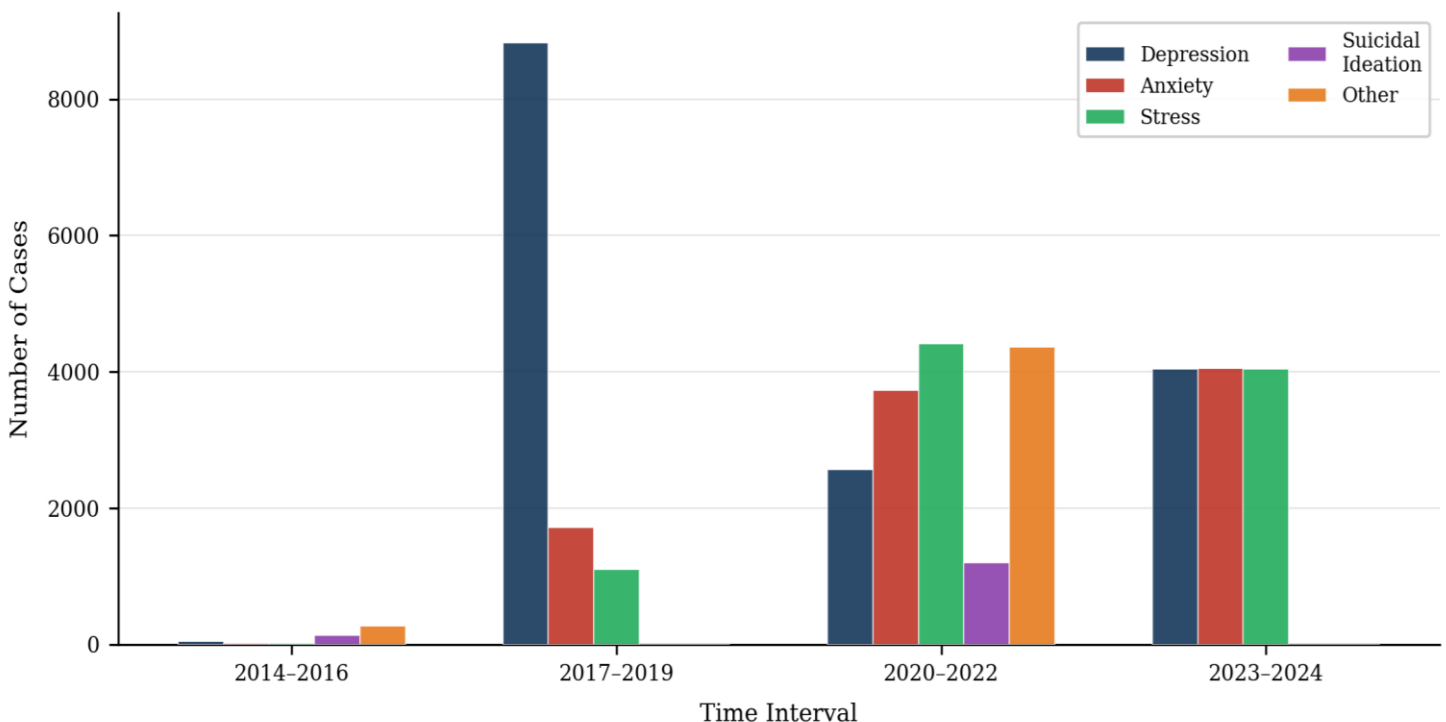


Figure 3: Numbers of Reported Cases by Mental Health Issue Across Four Study Intervals (2014-2024)

Prevalence of Mental Health Issues by Interval

During 2014-2016, overall mental health prevalence was 13.74%. Anxiety was most prevalent (10%), followed by stress (9.47%) and depression (8.85%). Suicidal ideation stood at 4.95%, while an exceptionally high proportion (96.48%) of cases were categorised under 'Other', suggesting limited diagnostic specificity during this early period.

Figure 4. Prevalence (%) of Mental Health Issues Among Malaysian Adolescents Across Four Study Intervals (2014-2024)

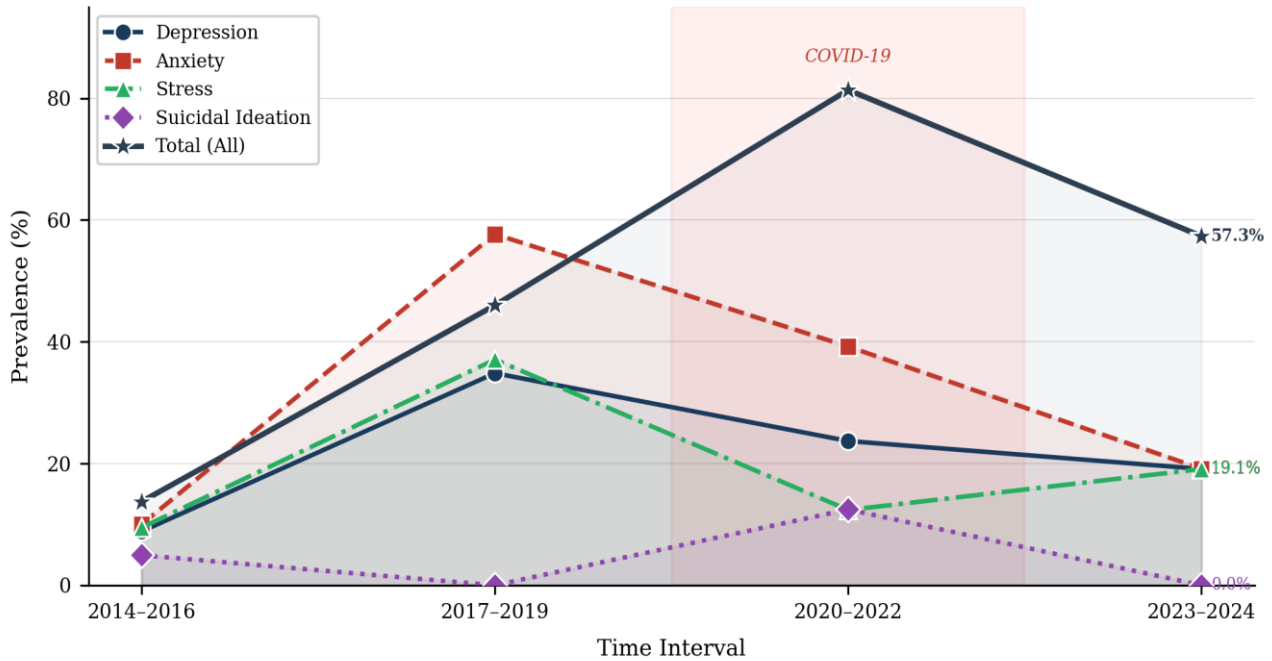


Figure 4. Prevalence (%) of mental health issues among Malaysian adolescents across four study intervals (2014–2024). The combined total prevalence line represents the aggregate across all reported conditions.

The 2017-2019 period recorded a dramatic increase: anxiety surged to 57.68%, stress to 37.08%, and depression to 34.84%, yielding a combined prevalence of 45.99% (Sahril et al., 2019). No suicidal ideation cases were reported, possibly reflecting narrowed study focus.

Prevalence peaked during 2020-2022 at a combined rate of 81.37%. Anxiety was most prevalent (39.22%), followed by depression (23.7%), suicidal ideation (12.46%), and stress (12.37%). Other mental health issues — internet addiction, disordered eating, and self-esteem problems — contributed 69.72%, reflecting the pandemic's broad psychological impact.

The 2023-2024 period showed a decrease, with depression (19.11%), anxiety (19.13%), and stress (19.10%) nearly equally prevalent, yielding a combined rate of 57.34%. The absence of suicidal ideation reports may reflect improved access to intervention services or reporting gaps.

Factors Influencing Mental Health

Across all four time intervals, family dynamics and socio-demographic factors were consistently identified as influencing mental health outcomes. Social problems also persisted throughout the decade. Peer relationships were significant in 2014-2016 and 2023-2024; academic and school environment featured in 2017-2019 and 2023-2024; and psychological and emotional factors appeared in 2014-2016 and 2020-2022. Bullying and cyberbullying emerged specifically in 2020-2022, coinciding with pandemic-related increases in online activity. Spiritual and religious factors were identified in 2017-2019 and 2023-2024 (Safwan Mohamad et al., 2018; Wil & Othman, 2021).

Three overarching macro-level factors shaped these trends. First, the COVID-19 pandemic (2020-2022) amplified existing vulnerabilities through social isolation, remote learning, and disrupted routines, dramatically increasing prevalence of anxiety, depression, and suicidal ideation. Second, accelerating digitalisation introduced new risk vectors — cyberbullying, excessive screen time, and social comparison — increasingly cited from 2020 onwards (Ibrahim et al., 2022; Sedek et al., 2020). Third, globalisation intensified academic competition and cultural expectations, contributing to academic stress and anxiety from 2017 onwards (Aziz et al., 2018; Ng & Wan Sulaiman, 2017).

Figure 5. Factors Influencing Mental Health Among Malaysian Adolescents Across Study Intervals (2014-2024)

Factor	Study Interval				Freq. Reported
	2014-2016	2017-2019	2020-2022	2023-2024	
Family Dynamics	Yes	Yes	Yes	Yes	(4/4)
Socio-Demographic Factors	Yes	Yes	Yes	Yes	(4/4)
Social Problems	Yes	Yes	Yes	Yes	(4/4)
Peer Relationships	Yes	-	-	Yes	(2/4)
Academic & School Environment	-	Yes	-	Yes	(2/4)
Psychological & Emotional Factors	Yes	-	Yes	-	(2/4)
Lifestyle Factors	-	-	Yes	-	(1/4)
Mental Health Issues (co-occurring)	-	-	Yes	-	(1/4)
Bullying & Cyberbullying	-	-	Yes	-	(1/4)
Spiritual & Religious Factors	-	Yes	-	Yes	(2/4)
Self-Esteem	-	-	Yes	-	(1/4)

Figure 5. Presence of contributing factors to adolescent mental health issues across four study intervals

Trend Analysis 2014-2024

The overarching trend across the decade reveals a clear epidemiological ascent. Depression cases escalated from 51 (2014-2016) to 8,825 (2017-2019), declined to 2,567 (2020-2022), and rose again to 4,045 (2023-2024), for a decade total of 15,488 cases. Anxiety followed a steady upward trajectory: 19, 1,719, 3,733, and 4,050 cases (total: 9,521). Stress similarly escalated: 18, 1,105, 4,412, and 4,042 cases (total: 9,577). Suicidal ideation was documented in 2014-2016 (138 cases) and 2020-2022 (1,201 cases) only (total: 1,339).

Ecopharmacovigilance Implications

The decade-long escalation in psychiatric disorder prevalence among Malaysian adolescents carries significant implications for ecopharmacovigilance. The increasing burden of depression, anxiety, and stress directly drives higher prescription rates for psychotropic medications — including SSRIs (e.g., fluoxetine, sertraline), benzodiazepines (e.g., diazepam, alprazolam), and atypical antipsychotics. These compounds are characterised by low environmental degradability and are frequently detected in hospital effluents, municipal wastewater, and surface waters in comparable settings (Fent et al., 2006; Kummerer, 2010).

In Malaysia, pharmaceutical environmental monitoring remains at an early stage. However, data from this review highlight that psychiatric drug demand has grown substantially — mirroring global patterns where rising mental health burdens correlate with measurable increases in pharmaceutical residues in aquatic environments (Verlicchi et al., 2012). The peak prevalence during 2020-2022 warrants particular attention, as pandemic-related surges in anxiolytic and antidepressant prescriptions likely translated into elevated environmental pharmaceutical loads. Wastewater treatment plants in Malaysia are not optimised for removal of psychoactive residues, increasing the risk of ecological exposure — particularly for endocrine-sensitive aquatic organisms (Brooks et al., 2003).

The observed trends underscore the urgency of embedding ecopharmacovigilance considerations into Malaysia's national mental health policy framework. Pharmaceutical take-back programmes, environmentally-assessed drug prescribing guidelines, and investment in advanced wastewater treatment technologies are increasingly relevant as the psychiatric medication burden grows. Healthcare professionals — including pharmacists — must be educated about the environmental life cycle of psychotropic drugs as part of an integrated One Health approach to mental healthcare delivery.

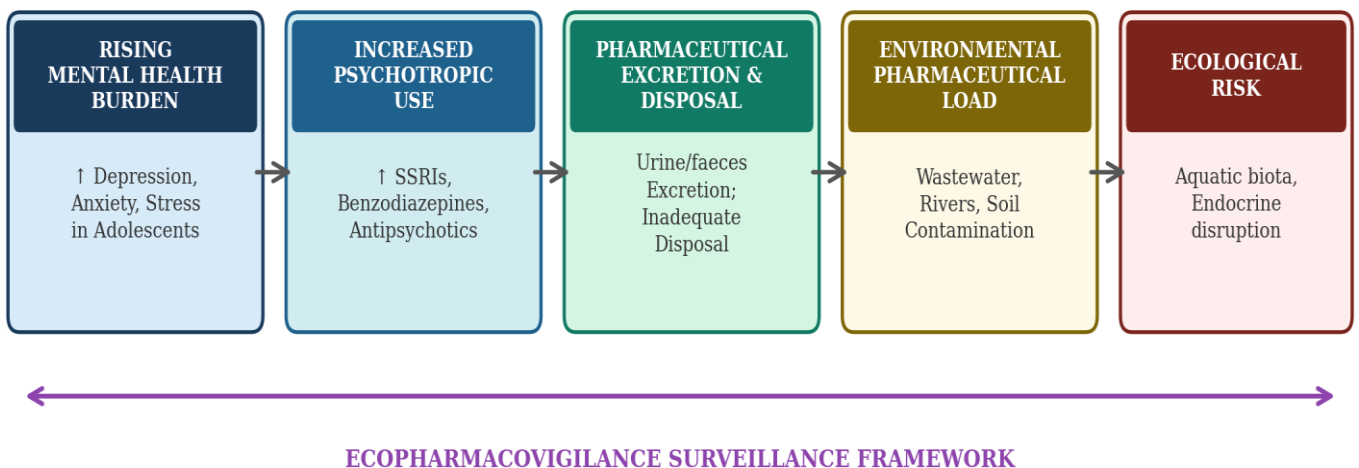
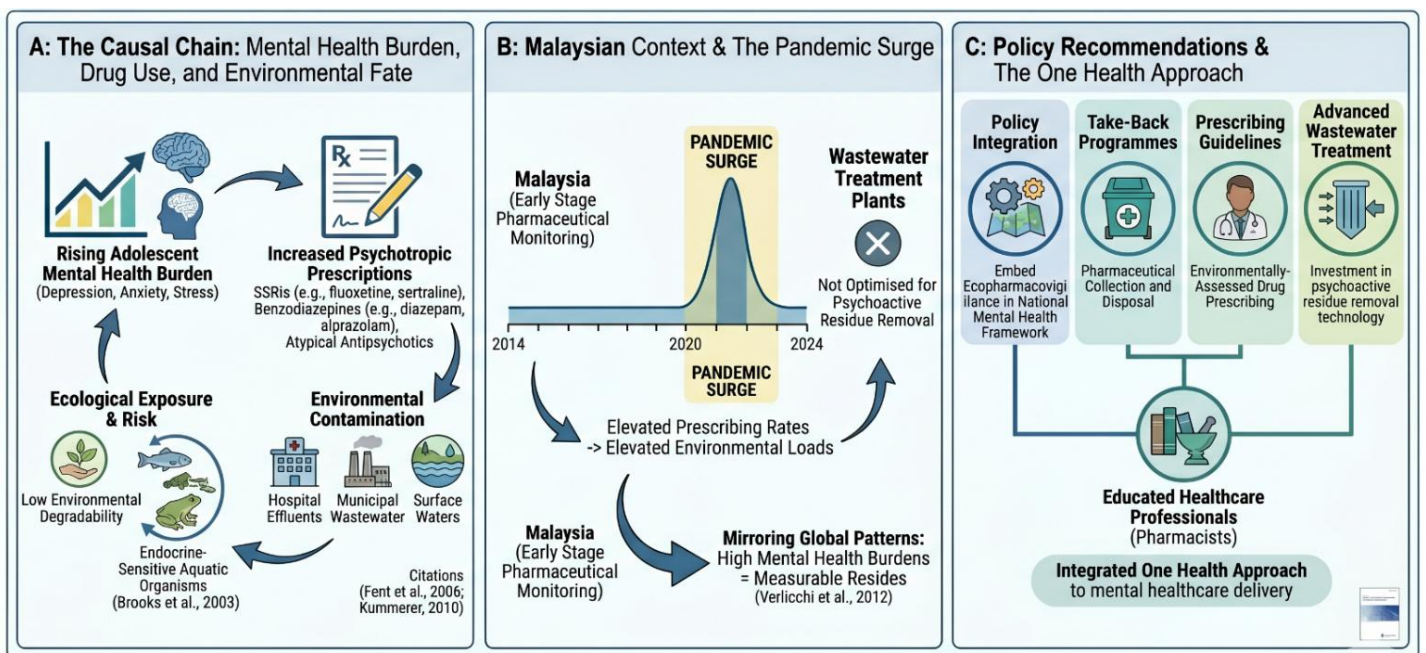


Figure 6. Conceptual framework and linkage between adolescent psychiatric morbidity burden and ecopharmacovigilance implications in the Malaysian context. EPV = Ecopharmacovigilance; SSRIs = Selective Serotonin Reuptake Inhibitors.

Strengths and Limitations

This review synthesised a decade of Malaysian-specific data across multiple study designs, providing a comprehensive epidemiological overview. The integration of an ecopharmacovigilance lens represents a novel contribution, contextualising clinical trends within a broader environmental health framework. Limitations include: the heterogeneity of diagnostic tools across included studies, limiting direct comparability of prevalence estimates; the limited number of eligible studies in the 2023-2024 interval ($n=2$); and the absence of primary pharmacoepidemiological data on actual psychotropic prescribing rates in Malaysia — a gap that future research should address to more precisely quantify the ecopharmacovigilance risk.

The persistently high prevalence of anxiety, depression, and stress — particularly among adolescents aged 15-18 — necessitates scaling up school-based mental health screening programmes and integrating adolescent mental health services into primary healthcare. For pharmacists and prescribers, growing awareness of environmental pharmacology should inform rational prescribing practices, including consideration of environmental persistence when selecting among therapeutically equivalent psychotropic agents. A nationally coordinated ecopharmacovigilance surveillance system — encompassing monitoring of psychotropic residues in Malaysian waterways and wastewater — would provide the evidence base needed to develop targeted environmental mitigation strategies.

CONCLUSION

This qualitative systematic review of 19 peer-reviewed studies documents a decade-long escalation in mental health disorders among Malaysian adolescents, with depression, anxiety, and stress as the predominant conditions. Prevalence rates increased substantially from 2014 to 2024, peaking during the COVID-19 pandemic period (2020-2022) at a combined rate of 81.37%, before declining to 57.34% in 2023-2024. Key contributing factors include family dynamics, socio-demographic influences, academic stress, digitalisation, and pandemic-related disruptions.

Viewed through the ecopharmacovigilance lens, these epidemiological trends carry important environmental implications. The increasing demand for psychotropic medications — directly linked to rising adolescent psychiatric morbidity — translates into a growing pharmaceutical burden on Malaysia's water systems and ecosystems. Proactive surveillance of psychoactive pharmaceutical residues in environmental matrices, coupled with green pharmacy education and evidence-based prescribing, is essential to mitigating downstream ecological harm.

A holistic, multidisciplinary response is therefore required: one that simultaneously addresses the clinical burden of adolescent mental ill-health and the environmental consequences of its pharmacological management. Future research should seek to quantify actual psychotropic prescribing volumes among Malaysian adolescents and directly assess the correlation between clinical prescription trends and environmental pharmaceutical detection in Malaysian waterways.

ACKNOWLEDGEMENT

The authors appreciate the support of UiTM Cawangan Pulau Pinang for facilitating the execution of this study. The authors used AI-assisted language editing tools to improve clarity and grammar during manuscript preparation. The author also used AI-assisted image generator to visualize the results. All intellectual content, interpretation of data and final decisions remain the responsibility of the authors.

Conflict of Interest

The authors declare that they have no conflicts of interest.

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