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**MENTAL HEALTH IS A HUMAN RIGHT:
ENSURING A HEALTHY AND DIGNIFIED LIFE FOR ALL**

NOVEMBER, 19 - 20, 2025

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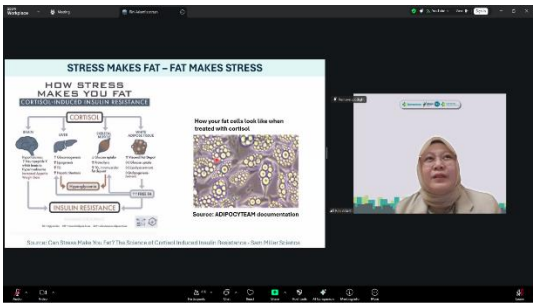
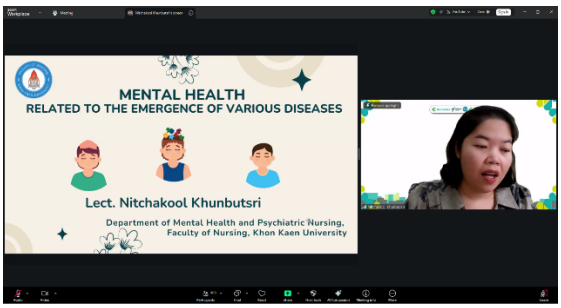
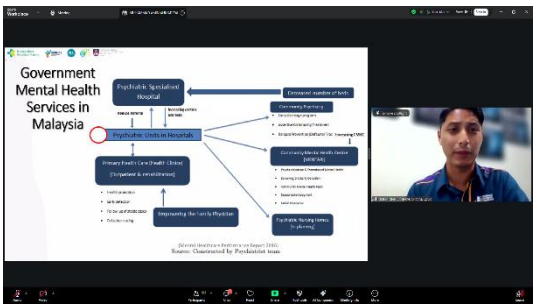
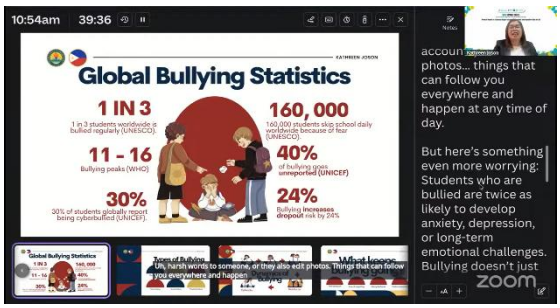
ABOUT ICWH

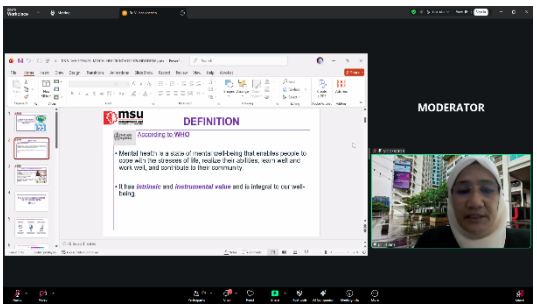
The International Conference on Food, Nutrition, and Health has been held since 2018 by the Health Polytechnic of Malang under its initial name, the International Conference and Workshop of Health (ICWH). Since its inception, ICWH has served as a forum for researchers and students to develop knowledge and gain insights into the latest trends and research in the fields of food, nutrition, and health. The conference features **international keynote speakers from various countries** and attracts **participants from overseas**, thereby fulfilling the criteria of an international scientific event. In 2025, ICWH was held offline in Malang and was attended by **402 participants from at least five countries**, namely Indonesia, Hungary, Thailand, Malaysia, and the Philippines.

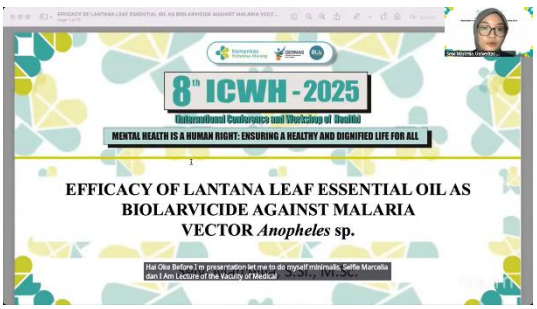












FOREWORDS

Afnani Toyibah, A.Per.Pen., M.Pd
Acting Director of Health Polytechnic of Malang

Assalammualaikum wr.wb.

Good morning.
On behalf of the Health Polytechnic of Malang, it is my great honor and pleasure to welcome all distinguished speakers, researchers, practitioners, and participants to the International Conference and Workshop of Health (ICWH). Since its inception in 2018 under the initial name International Workshop on Health, ICWH has continuously served as an international academic platform that brings together scholars and professionals to share knowledge, exchange ideas, and discuss emerging issues in the fields of food, nutrition, and health.
The theme of this conference, "Mental Health is a Human Right: Ensuring a Healthy and Dignified Life for All," reflects a global commitment to recognizing mental health as an integral component of human dignity and overall well-being. As highlighted in the scientific presentations delivered during this conference, mental health is closely interconnected with physical health, social conditions, and cultural contexts. Issues such as adolescent mental health, bullying prevention, trauma healing, chronic disease management, and the integration of digital health innovations demonstrate the complexity and urgency of mental health challenges faced by societies worldwide.
ICWH 2025 was conducted offline in Malang and successfully gathered 402 participants from at least five countries, representing a diverse academic and professional background. The presence of international keynote speakers and overseas participants further strengthens the role of ICWH as a truly international scientific forum. Through multidisciplinary discussions and evidence-based perspectives, this conference emphasizes the importance of integrated, ethical, and human-centered approaches in promoting mental health, preventing disease, and improving quality of life.
The proceedings of ICWH compile selected papers that reflect current research trends, best practices, and innovative solutions in health sciences. We hope that these proceedings will not only contribute to academic advancement but also provide practical insights for policymakers, educators, and healthcare providers in developing effective and inclusive health strategies.
I would like to express my sincere appreciation to the organizing committee, editorial team, reviewers, speakers, and all contributors who have worked tirelessly to ensure the success of this conference and the publication of these proceedings. It is my hope that the knowledge shared through ICWH will foster continued collaboration, inspire future research, and contribute to the realization of health as a fundamental human right for all.
Thank you.

Wassalammualaikum wr.wb.

RUNDOWN

DAY / DATE	TIME (GMT + 7)	ACTIVITIES	PERSON IN CHARGE OF ACTIVITIES
Wednesday, November 19, 2025	08.30 - 08.45 AM	**NATIONAL ANTHEM AND HYMN OF HEALTH POLYTECHNIC OF MALANG**	**EVENT DIVISION**
	08.45 - 09.00 AM	**PRAYER** By: ***apt. M. Hasan Wattiheluw, S.Farm., M.Farm.*** *(Lecturer of Health Polytechnic of Malang)*	
	09.00 - 09.30 AM	**Welcome Speech** *By: **Afnani Toyibah, A.Per.Pen., M.Pd*** *(Acting Director of Health Polytechnic of Malang)*	
	09.30 – 10.30 AM	**SPEAKER I : FAT-BRAIN CONNECTION: HOW BODY FAT INFLUENCES MENTAL HEALTH** By: **Rini Arianti, Ph.D** *(Lecturer, University of Debrechen - Hungary)*	**MODERATOR : Nia Lukita Ariani, S.Si., M.Sc.** *(Lecturer of Health Polytechnic of Malang)*
	10.30 - 11.30 AM	**SPEAKER II : MENTAL HEALTH RELATED TO THE EMERGENCE OF VARIOUS DISEASE** By: **Lect. Nitchakool Khunbutsri** *(Lecturer, Khon Kaen University - Thailand)*	**MODERATOR : Khairuddin, M.Pd.** *(Lecturer of Health Polytechnic of Malang)*
	11.30 – 12.00 PM	**SCREENING AND VOTING FOR POSTER PRESENTATIONS**	**MODERATOR Nafilatul Fitri, S.ST., M.KKK** *(Lecturer of Health Polytechnic of Malang)*
	13.00 – 15.00 PM	**ORAL PRESENTATION**	**MODERATOR: Nafilatul Fitri, S.ST., M.KKK** *(Lecturer of Health Polytechnic of Malang)* **OBSERVER** Dr. Nurul Pujiastuti, S.Kep., Ns., M.Kes.

DAY / DATE	TIME (GMT + 7)	ACTIVITIES	PERSON IN CHARGE OF ACTIVITIES
			Dr. Finta Isti Kundarti, S.SiT., M.Keb. Fitriana Kurniasari Solikhah, S.Kep., Ns., M.Kep.
Thursday, November 20, 2025	08.30 – 09.30 AM	**SPEAKER III : SILENT STRUGGLES: UNDERSTANDING YOUTH MENTAL HEALTH IN MALAYSIA** By: **Muhammad Amin Ahmad Zaki, M.Sc.** *(Senior Lecturer, Faculty of Health Sciences, Universiti Teknologi MARA (UiTM), Malaysia)*	**MODERATOR : Eka Wulandari, M.Pd.** *(Lecturer of Health Polytechnic of Malang)*
	09.30 – 10.30 AM	**SPEAKER IV : EMPOWERING STUDENTS STRATEGIES TO PREVENT BULLYING AND STRENGTHEN MENTAL HEALTH** By: **Kathreen C. Joson, Ph.D.** *(Registered Psychologist/Registered Guidance Counselor, Associate Professor V, Isabela State University, City of Ilagan, Philippines)*	**MODERATOR : Eka Wulandari, M.Pd.** *(Lecturer of Health Polytechnic of Malang)*
	10.30 – 11.30 AM	**SPEAKER V : HUMAN DIGNITY BEGINS WITH THE MIND: THE ROLE OF HEALTHCARE PROVIDERS IN UPHOLDING MENTAL HEALTH RIGHTS** By: **Dr. Vilma Ajijul Jana** *(Senior Lecturer, Management and Science University, Malaysia)*	**MODERATOR : Eka Wulandari, M.Pd.** *(Lecturer of Health Polytechnic of Malang)*
	11.30 – 14.30 PM	**ORAL PRESENTATION**	**MODERATOR: Nafilatul Fitri, S.ST., M.KKK** *(Lecturer of Health Polytechnic of Malang)* **OBSERVER** Dr. Nurul Pujiastuti, S.Kep., Ns., M.Kes. Dr. Finta Isti Kundarti, S.SiT., M.Keb.

DAY / DATE	TIME (GMT + 7)	ACTIVITIES	PERSON IN CHARGE OF ACTIVITIES
			Fitriana Kurniasari Solikhah, S.Kep., Ns., M.Kep.
	14.30 – 15.00 PM	**ANNOUNCEMENT OF THE BEST ORAL AND POSTER PRESENTATION**	**EVENT DIVISION**
	15.00 – 15.10 PM	**CLOSING**	

8th ICWH - 2025

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MENTAL HEALTH IS A HUMAN RIGHT: ENSURING A HEALTHY AND DIGNIFIED LIFE FOR ALL

ABSTRACT
ORAL PRESENTERS

Effectiveness of Lantana camara Leaf Essential Oil as a Biolarvicide Against Anopheles sp. Larvae

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Abstract: *Background: Malaria remains a major public health problem in Indonesia and is transmitted by Anopheles mosquitoes. Vector control targeting the larval stage is an effective strategy to interrupt mosquito life cycles. However, prolonged use of chemical larvicides may lead to resistance and environmental toxicity. Therefore, plant-based biolarvicides are considered safer alternatives. Lantana camara leaves contain essential oils and bioactive compounds with potential larvicidal properties.Objective: This study aimed to evaluate the effectiveness of Lantana camara leaf essential oil as a biolarvicide against Anopheles sp. larvae and to determine its LC_{50} and LC_{90} values. Methods: This experimental quantitative study was conducted from April to September 2024 at the Laboratory of FMIPA, University of Lampung. Essential oil was extracted using the steam-water distillation method from 2 kg of Lantana camara leaves. Larvicidal activity was tested on third and fourth instar Anopheles larvae using concentrations of 0.5%, 0.75%, 1%, and 1.25%, with negative control (distilled water) and positive control (1% temephos). Each treatment was repeated four times using 25 larvae per group. Mortality was observed hourly for 24 hours. Data were analyzed using probit analysis and one-way ANOVA. Results: The extraction yield of essential oil was 14%. The highest mortality (100%) was achieved at a concentration of 1.25% after 21 hours of exposure. Probit analysis showed that LC_{50} and LC_{90} at 21 hours were 0.505% and 1.137%, respectively. One-way ANOVA demonstrated a significant difference in larval mortality among treatment groups ($p < 0.001$). Conclusion: Lantana camara leaf essential oil is effective as a biolarvicide against Anopheles sp. larvae and has strong potential as an eco-friendly alternative to chemical larvicides.*

Keywords: *Malaria, Anopheles sp., Lantana camara, Essential oil, Biolarvicide, Vector control.*

INTRODUCTION

Malaria remains one of the most serious public health problems in tropical and subtropical regions, particularly in developing countries. The disease is caused by Plasmodium parasites and transmitted to humans through the bite of infected female Anopheles mosquitoes. According to the World Health Organization (WHO), hundreds of millions of malaria cases are reported globally each year, with significant morbidity and mortality, especially among children under five years and pregnant women. Southeast Asia, including Indonesia, continues to carry a substantial malaria burden due to favorable климат, environmental conditions, and persistent vector populations.

Indonesia is one of the malaria-endemic countries in the Asia-Pacific region. Although national malaria elimination programs have successfully reduced cases in several provinces, malaria transmission remains persistent in many areas, especially in eastern Indonesia such as Papua, West Papua, and parts of Sumatra. Lampung Province is categorized as a region with ongoing malaria transmission, particularly in rural and coastal areas. The

persistence of malaria in these regions is closely related to environmental factors, population mobility, limited access to health services, and the continuous presence of competent mosquito vectors.

Vector control plays a pivotal role in malaria prevention and elimination. Among the various strategies used, interruption of the mosquito life cycle at the larval stage is considered one of the most effective approaches. Larval control reduces adult mosquito populations before they become capable of transmitting the parasite. Chemical larvicides, such as organophosphates (e.g., temephos) and insect growth regulators, have been widely applied in public health programs due to their rapid and effective larvicidal activity. However, the long-term and continuous use of synthetic larvicides has led to several serious problems, including the development of insecticide resistance, environmental pollution, toxicity to non-target organisms, and potential adverse effects on human health.

Resistance of mosquito larvae to temephos and other chemical larvicides has been reported in several endemic regions worldwide, including Indonesia. This resistance reduces the effectiveness of vector control programs and increases the risk of malaria resurgence. In addition, chemical larvicides may contaminate aquatic ecosystems and disrupt biodiversity, as they are often toxic to fish, aquatic invertebrates, and beneficial microorganisms. These limitations highlight the urgent need to develop alternative, safer, and environmentally friendly larvicides that are both effective and sustainable.

Plant-based larvicides, also known as biolarvicides, have gained increasing attention as a promising alternative to synthetic chemicals. Biolarvicides are derived from natural plant compounds that possess insecticidal, larvicidal, or repellent properties. Compared to synthetic larvicides, plant-based products are generally biodegradable, less toxic to non-target organisms, readily available, and more acceptable to communities. Numerous plant species have been reported to exhibit larvicidal activity against mosquito vectors, including Azadirachta indica, Ageratum conyzoides, Cymbopogon citratus, and Ocimum basilicum. The effectiveness of these plants is attributed to secondary metabolites such as alkaloids, terpenoids, flavonoids, saponins, and essential oils.

Essential oils are volatile aromatic compounds extracted from various plant parts, including leaves, stems, flowers, and roots. These oils contain complex mixtures of bioactive compounds that can affect insects through multiple mechanisms, such as disruption of the nervous system, inhibition of respiration, interference with cuticular permeability, and alteration of metabolic processes. Because of their multi-target modes of action, essential oils are less likely to induce resistance compared to single-compound synthetic insecticides. Moreover, essential oils generally degrade rapidly in the environment, reducing the risk of long-term ecological contamination.

One plant that has attracted interest for its insecticidal potential is Lantana camara L., a perennial shrub belonging to the family Verbenaceae. Lantana camara is widely distributed in tropical and subtropical regions and grows abundantly as a wild plant in Indonesia. It is commonly regarded as a weed due to its aggressive growth and invasiveness, yet it possesses significant medicinal and biological properties. Traditionally, different parts of the plant have been used to treat various ailments, including skin infections, respiratory disorders, and gastrointestinal diseases. Phytochemical studies have revealed that Lantana camara contains a wide range of bioactive compounds such as flavonoids, alkaloids, tannins, saponins, triterpenoids, and essential oils.

Previous studies have reported that extracts and essential oils of Lantana camara exhibit antimicrobial, antifungal, anti-inflammatory, antioxidant, and insecticidal activities. The insecticidal properties of Lantana camara are mainly attributed to compounds such as β-caryophyllene, caryophyllene oxide, germacrene-D, and various monoterpenes and sesquiterpenes present in its essential oil. These compounds are known to exert toxic effects on insects by acting as neurotoxins, respiratory inhibitors, and membrane disruptors. Several experimental studies have demonstrated the larvicidal activity of Lantana camara extracts against mosquito species such as Aedes aegypti and Culex quinquefasciatus. However, data on its effectiveness against Anopheles larvae, particularly using essential oil preparations,

remain limited and inconsistent across different geographical regions.

The larvicidal potency of plant-derived essential oils can vary significantly depending on multiple factors, including plant species, geographical origin, climatic conditions, extraction methods, solvent types, and mosquito species tested. Therefore, it is essential to evaluate the effectiveness of Lantana camara essential oil specifically against Anopheles larvae in local settings. Such studies are crucial to determine the feasibility of using this plant as a locally available, cost-effective, and environmentally friendly biolarvicide in malaria-endemic areas.

In Lampung Province, Lantana camara grows abundantly in residential areas, roadsides, and agricultural fields, yet its potential utilization for vector control has not been widely explored. The availability of this plant in large quantities presents an opportunity to develop a sustainable biolarvicide using locally sourced raw materials. If proven effective, Lantana camara essential oil could serve as an alternative to chemical larvicides, thereby reducing reliance on synthetic insecticides and minimizing environmental risks.

This study was conducted to evaluate the larvicidal effectiveness of Lantana camara leaf essential oil against Anopheles sp. larvae under laboratory conditions. Specifically, this study aimed to determine the lethal concentrations required to kill 50% (LC_{50}) and 90% (LC_{90}) of larvae and to compare its effectiveness with the commonly used chemical larvicide temephos. The findings of this study are expected to contribute to the development of environmentally friendly malaria vector control strategies and to provide scientific evidence supporting the utilization of Lantana camara as a natural biolarvicide.

METHODS

This study was a laboratory-based experimental quantitative study. The research was conducted at the Biology and Chemistry Laboratory, Faculty of Mathematics and Natural Sciences, University of Lampung, from April to September 2024.

Fresh Lantana camara leaves were collected from residential areas in Korpri Raya, Bandar Lampung. Botanical identification was performed at the Botany Laboratory, FMIPA University of Lampung, confirming the species as Lantana camara L.

Two kilograms of semi-dried leaves were subjected to steam-water distillation at 100–105°C. The vaporized oil-water mixture was condensed and separated using a separatory funnel. The obtained essential oil yield was calculated.

Third and fourth instar Anopheles larvae were reared from eggs and maintained under laboratory conditions with chicken liver as feed. A total of 600 larvae were used.

Six groups were applied:

- Negative control: Distilled water
- Positive control: Temephos 1%
- Essential oil concentrations: 0.5%, 0.75%, 1%, and 1.25%

Each group contained 25 larvae and was replicated four times, following WHO guidelines.

Larval mortality was observed hourly for 24 hours. Larvae were considered dead if no movement was observed after stimulation.

Mortality percentages were calculated using Microsoft Excel. Statistical analysis was performed using SPSS software. Normality was tested by Shapiro–Wilk test, followed by One-Way ANOVA and Games-Howell post-hoc test. Probit analysis was used to determine LC_{50} and LC_{90} values at a 95% confidence interval.

RESULTS

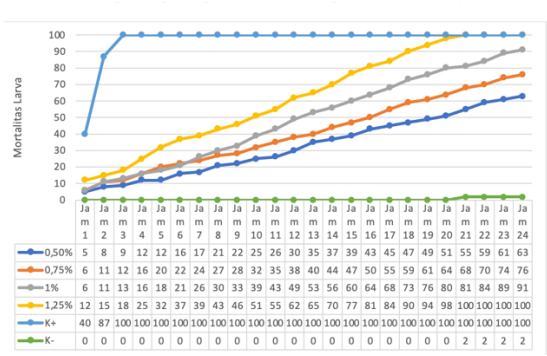
From 1500 g of fresh leaves, 210 g of essential oil was obtained, with a total extraction yield of 14%, which is categorized as low extraction efficiency.

Table 1. Yield of Essential Oil

Hasil Perhitungan Nilai Rendemen

Berat Basah (g)	Berat Ekstrak (g)	Nilai Rendemen (%)
1500	210	14

The highest larval mortality (100%) was achieved at a concentration of 1.25% after 21 hours of exposure. Lower concentrations showed gradual but dose-dependent increases in mortality over time.



Picture 1. Larval Mortality

The LC_{50} and LC_{90} values at 21 hours were:

- LC_{50} = 0.505%
- LC_{90} = 1.137%

These values indicate strong larvicidal activity of the essential oil.

DISCUSSION

The results demonstrate that Lantana camara leaf essential oil possesses significant larvicidal activity against Anopheles larvae. The observed mortality showed a dose- and time-dependent pattern, consistent with previous studies reporting insecticidal properties of Lantana camara. The essential oil contains compounds such as β-caryophyllene, caryophyllene oxide, germacrene-D, and eucalyptol, which are known to disrupt nervous and respiratory systems in insect larvae

The LC_{50} value of 0.505% indicates high toxicity to mosquito larvae, as lower LC values correspond to stronger larvicidal potency. The LC_{90} value slightly exceeded the WHO recommended threshold of 1%, suggesting that while highly effective, concentration optimization and toxicity studies in non-target organisms are still required.

Compared to temephos, the 1.25% essential oil concentration showed equivalent larvicidal performance, indicating its potential as an alternative bioinsecticide. Moreover, biolarvicides derived from plants are biodegradable and less likely to cause long-term environmental contamination or resistance development.

CONCLUSIONS

In conclusion, Lantana camara leaf essential oil demonstrates strong larvicidal activity against Anopheles sp. larvae and shows great potential as an environmentally friendly alternative to synthetic larvicides. The observed dose- and time-dependent mortality, along with relatively low LC_{50} and LC_{90} values, indicates that this plant-based product is highly effective in controlling mosquito larvae. Given its abundant local availability, biodegradability, and lower risk of environmental contamination, Lantana camara essential oil may serve as a sustainable component of integrated malaria vector control programs. Nevertheless, further studies are needed to evaluate its field effectiveness, stability, safety toward non-target organisms, and large-scale application feasibility.

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Integrative Interventions Addressing Nutritional and Mental Health Factors for Prevention of Anemia in Pregnant Women: A Systematic Review from the Perspective of Human Rights and Dignity

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Abstract: *Anemia in pregnancy remains a significant global health problem associated with adverse maternal and neonatal outcomes. Despite widespread nutrition programs, limited attention has been given to interventions that simultaneously address nutritional status and maternal mental health. This study aims to systematically review integrated interventions combining nutrition education, iron supplementation, and psychosocial or mental health support for improving hemoglobin levels and psychological wellbeing among pregnant women. A systematic literature review was conducted following PRISMA guidelines, using the PICO framework to identify relevant studies published between 2015 and 2025 from Scopus, PubMed, and WHO databases. Ten empirical studies met the inclusion criteria. The findings consistently demonstrate that bundled interventions are more effective than single-component approaches, yielding improvements in hemoglobin status, anemia prevention behaviors, mental wellbeing, empowerment, and adherence to supplementation. Interventions incorporating family support, digital health tools, or dignity-centered counseling showed stronger and more sustainable effects. In conclusion, integrated nutrition and mental health interventions offer substantial benefits for maternal health and should be incorporated into antenatal care policies and midwifery practice. Further research is needed to explore culturally adapted models and long-term outcomes.*

Keywords: *anemia prevention, pregnancy, nutrition intervention, mental health, dignity-based care.*

INTRODUCTION

Anemia during pregnancy remains a persistent global health challenge, critically affecting both maternal and neonatal outcomes. The prevalence of maternal anemia, especially in low- and middle-income countries, continues to pose significant public health concerns, increasing the risks of preterm birth, low birth weight, maternal mortality, and impaired neurocognitive development in children (Wang et al., 2025). Recent evidence also highlights the strong association between anemia and maternal mental health, with affected pregnant women experiencing higher rates of depression, anxiety, and reduced quality of life throughout gestation and the postpartum period (Azami et al., 2019; Kwak et al., 2022; Wedderburn et al., 2022).

The central research question of this review is: "How can integrated interventions that address both nutritional and mental health factors improve hemoglobin status and psychological wellbeing in pregnant women?" The aim of this study is to systematically synthesize recent scientific evidence regarding the effectiveness of bundled interventions including nutrition education, iron supplementation, and psychosocial or mental health support targeted at pregnant women, analyzed through the lens of health rights and maternal dignity (Kwak et al., 2025; Muthuka et al., 2025).

The theoretical framework for this review is based on the biopsychosocial model, emphasizing the interplay between biological factors (such as iron status), psychosocial aspects (including family support and mental health services), and maternal rights to support

optimal health outcomes for both mothers and infants (Blount et al., 2021; Duberstein et al., 2021). Promoting maternal health rights and dignity is not only crucial for improving clinical outcomes but also urgently aligns with global agendas such as the Sustainable Development Goals (SDGs) (Souza et al., 2024).

This systematic review is expected to produce evidence-based recommendations for maternal health policies, specifically advocating for the integration of mental health promotion with anemia prevention efforts in primary care and independent midwifery settings. The anticipated benefits include the development of holistic and dignified care models, enhanced capacity for midwives and healthcare professionals, and strengthened national and international policymaking related to maternal health.

METHODS

This research adopted a systematic literature review (SLR) design, applying PRISMA guidelines to ensure transparency and rigor throughout the reporting process. The search strategy was systematically constructed using the PICO framework to clarify and maintain focus on the review's objectives. The Population (P) comprised pregnant women in any region and clinical or community setting, reflected in keywords such as "Pregnant Women," "Maternal," and "Antenatal." The Intervention (I) encompassed integrated approaches for anemia prevention, including nutrition counseling, iron supplementation, and mental health or psychosocial support—identified with terms like "Nutrition," "Iron Supplementation," "Mental Health," "Psychosocial Support," and "Empowerment." The Comparison (C) typically referred to standard care, single-component interventions, or groups who did not receive integrated programs. The Outcomes (O) assessed included hemoglobin levels, anemia status, mental wellbeing, maternal empowerment, and quality of life, with search terms such as "Hemoglobin," "Anemia," "Depression," "Anxiety," "Wellbeing," and "Quality of Life." This approach ensured that the literature search remained strictly relevant to the study's aims of synthesizing evidence on bundled interventions for anemia and maternal mental health.

Articles were identified through comprehensive electronic searches of Scopus, PubMed, and the WHO Global Health Library, focusing on studies published between 2015 and 2025. Inclusion criteria encompassed original quantitative (randomized controlled trials, cohort, cross-sectional) and qualitative studies evaluating nutrition-based and/or mental health interventions among pregnant women. Studies involving populations other than pregnant women, missing original data, or lacking focus on relevant intervention outcomes were excluded. Further, studies addressing specific anemia types unrelated to nutrition (e.g., hemoglobinopathies), reviews, editorials, or duplicate publications were excluded to maintain scientific rigor.

Data extraction was performed independently by two reviewers, collecting information on publication details, study design, participant demographics, intervention types, comparators, and measurable outcomes including hemoglobin status, anemia prevalence, mental health scores, and empowerment effects. Instrument quality and risk of bias were critically appraised using established checklists, notably the Joanna Briggs Institute (JBI) tool and the Cochrane Risk of Bias assessment for less conventional methodologies (JBI, 2021). Duplicate studies were removed during the extraction process.

Analysis was conducted using narrative synthesis, collating and comparing recurring themes and results to identify intervention effectiveness patterns. Due to heterogeneity in study designs and measured outcomes, no meta-analysis was performed. All methodological steps adhered strictly to standards for systematic reviews, ensuring validity and reproducibility in article selection, appraisal, and synthesis.

RESULTS

The PRISMA flow diagram (Figure 1) illustrates the process of article search and screening for this literature review.

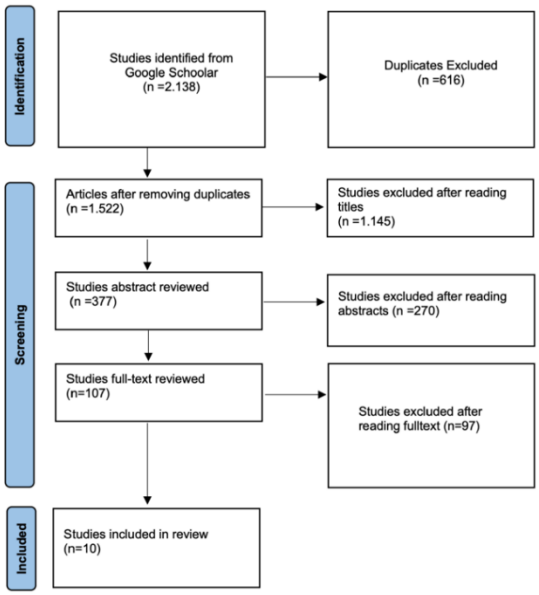

Figure 1. PRISMA flow diagram

As depicted in the PRISMA flow diagram (Figure 1), systematic searches across Scopus, PubMed, Nature, ScienceDirect, and relevant open-access journal databases yielded a total of 2.138 records. Removal of duplicates via Mendeley and manual verification resulted in 1.522 unique entries. Rigorous title and abstract screening excluded 1.415 studies lacking relevance to pregnant women, anemia prevention, and integrated nutrition and mental health interventions. After abstract review, 107 articles were retrieved for full-text assessment. Detailed eligibility screening applying the PICO framework and predefined criteria excluded 97 studies for reasons including non-pregnant populations, missing outcome measures, lack of original data, or focus on non-integrative approaches.

Consequently, 10 eligible empirical studies published between 2015 and 2025 were selected for narrative synthesis. These studies represent diverse geographic regions, including Asia (Indonesia, India, China), Africa (Senegal, Egypt), and Europe (Netherlands, UK, Ethiopia). Sample sizes ranged from 50 to 980 participants, and study designs comprised randomized controlled trials (RCTs), quasi-experimental interventions, cross-sectional and longitudinal surveys, and behavioral trials.

All included studies evaluated bundled strategies combining nutrition education, dietary supplementation, psychosocial or mental health counseling, family empowerment, or technology-mediated behavioral support. Common comparator groups included standard antenatal care or single-component interventions.

Extracted outcomes consistently covered hemoglobin (Hb) level, anemia status, mental wellbeing (depression/anxiety scores), empowerment, and self-care behaviors. Risk of bias was assessed using the Joanna Briggs Institute checklist and the Cochrane Risk of Bias tool to ensure quality and methodological soundness.

Narrative synthesis identified clear patterns:

- Bundled/interdisciplinary interventions significantly improved nutritional intake, hemoglobin levels, and reduced anemia incidence compared to standard care or nutrition-only approaches.
- Inclusion of psychosocial support or mental health counseling was associated with improved maternal wellbeing, empowerment, self-efficacy, and adherence to supplementation and healthy diet.
- Interventions leveraging family, community, or digital support promoted dignity and sustainability of behavioral change.
- Heterogeneity in design and outcome measurements precluded meta-analysis, but effectiveness patterns were robust across geographic and methodological contexts.

Table 1 presents the detailed characteristics, interventions, and principal findings from the ten included studies.

Table 1. Characteristics and Key Findings of Ten Empirical Studies on Integrative Nutrition and Mental Health Interventions for Anemia Prevention in Pregnant Women (2015–2025)

No	Author (Year)	Country	N	Design	Intervention	Key Findings
1	(Suriati & Juliani, 2025)	Indonesia	50	Quasi-exp	Nutrition education (local diet)	↑ intake; ↑ knowledge
2	(Zhao et al., 2015)	Senegal	223	RCT	Nutrition + family empowerment	↑ knowledge; ↓ anemia
3	(Anato & Reshid, 2025)	Ethiopia	320	Quasi-exp	Nutrition ed + IFA (HBM)	↑ Hb; ↑ adherence; ↓ anemia
4	(Lusterma ns et al., 2025)	Netherlands	510	Cross-sec	Nutrition + mental health	Positive diet–mental health–adherence link
5	(Yelverton et al., 2022)	UK	980	Longitudinal	Supplements + mental health	↑ wellbeing; ↓ anemia
6	(Zakiah et al., 2023)	Indonesia	401	RCT	Nutrition education	↑ knowledge; ↑ Fe intake; ↓ anemia
7	(Jin et al., 2024)	China	416	RCT	Nutrition + mental health counseling	↑ Hb; ↓ depression

No	Author (Year)	Country	N	Design	Intervention	Key Findings
8	(Iglesias-Vázquez et al., 2024)	Spain	230	RCT	Prenatal iron supplementation tailored to maternal iron stores	improved maternal hemoglobin and iron status; also linked to reduced behavioral/emotional problems and improved neurodevelopment
9	(Triharini et al., 2019)	Indonesia	100	Quasi-exp	Health promotion + nutritioned + SDT	↑ behavior; ↑ Hb; ↓ anemia
10	(Fatthy & Ezzat, 2020)	Egypt	300	Quasi-exp	mHealth + nurse support	↑ self-care; ↑ knowledge; ↑ Hb

Of the ten eligible studies identified and synthesized, most demonstrated that integrated approaches combining nutrition education, dietary supplementation, and psychosocial or behavioral support were effective for improving maternal health outcomes in pregnancy. Key reported outcomes included increased dietary intake, improved hemoglobin levels, greater anemia prevention behaviors, and enhanced empowerment or self-care among pregnant women.

DISCUSSION

The findings of this systematic review are discussed below in relation to the key domains identified in the reviewed studies, highlighting both physical and psychological aspects of integrative nutrition and mental health interventions for anemia prevention in pregnant women.

Physical Recovery

Physical recovery during pregnancy and postpartum involves nutritional repletion, restoration of hemoglobin levels, and improvement of physical well-being. Findings from the reviewed studies demonstrate that bundled nutrition education, dietary supplementation, and behavioral empowerment interventions significantly accelerate improvement in nutritional intake and hemoglobin status. For example, Suriati et al. (2025) and Zakiah et al. (2023) found that interactive nutrition education led to marked increases in protein, iron, and overall micronutrient consumption, with associated improvements in hemoglobin levels compared to control groups. The proposed mechanism involves improved dietary knowledge and behavioral motivation, which facilitate compliance with nutritional recommendations and physiological recovery.

Family and Psychosocial Support

Family empowerment and psychosocial counseling emerged as crucial elements for successful anemia prevention. Seck et al. (2015) and Abraham et al. (2024) reported that interventions including family support and mental health counseling doubled adherence to iron supplementation and healthy eating practices. Social support not only fosters adherence but also enhances the dignity and psychological resilience of pregnant women in various cultural settings.

Psychological Well-being

Several reviewed studies highlighted the positive impact of integrated interventions on maternal psychological well-being. Song et al. (2024) and Yelverton et al. (2021) demonstrated that mental health counseling and behavioral support reduced symptoms of anxiety and depression and elevated self-efficacy and quality of life among pregnant participants. The improvement is attributed to effective stress management, emotional validation, and increased empowerment resulting from combined nutrition-mental health models.

Effect Variation and Moderating Factors

The effectiveness of interventions varies according to intensity, duration, cultural adaptation, and individual maternal characteristics. Triharini et al. (2020) emphasized that interventions based on self-determination theory yielded the most robust changes when delivered consistently and tailored to women's specific needs. Differences in parity, education, and baseline nutritional status may moderate the outcomes of integrative models.

Practice and Policy Implications

These systematic review results strongly suggest that multidimensional interventions combining nutrition and mental health support can yield substantial physical and psychological benefits for pregnant women. Healthcare providers are encouraged to incorporate bundled strategies—including family counseling, digital behavioral support, and culturally adapted education—into antenatal care protocols for more effective anemia prevention and maternal empowerment.

Contribution to Research

This review contributes new insights into the value of integrating psychosocial

empowerment with nutrition interventions in maternal health. By distilling key findings from multiple global studies, it clarifies the current evidence and highlights directions for future investigation, such as evaluating the long-term impact of bundled models on maternal and infant outcomes.

Limitations

It is important to acknowledge certain limitations. The reviewed studies exhibit variation in design, sample size, and measurement tools, contributing to heterogeneity in reported outcomes. Additionally, generalizability to diverse cultural or socioeconomic contexts may be restricted due to differences in intervention adaptation and local health system capabilities..

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Analysis of User Satisfaction Level of the Electronic Medical Record at Dr. Saiful Anwar Hospital

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Abstract: *The implementation of Electronic Medical Records (EMR) is an essential component of the Hospital Management Information System (HMIS) to improve service efficiency and quality. Dr. Saiful Anwar Regional General Hospital has implemented EMR since 2020; however, its operation still faces challenges such as unstable network connections and slow system loading during service. This study aims to analyze the level of user satisfaction with the EMR at the outpatient registration unit of Dr. Saiful Anwar Hospital using the End User Computing Satisfaction (EUCS) method, which includes five dimensions: content, accuracy, format, ease of use, and timeliness. This research employs a quantitative descriptive design with a cross-sectional approach, using questionnaires distributed to 19 registration officers. The results show that user satisfaction is classified as satisfied, with details as follows: content 86%, accuracy 82%, format 83%, ease of use 83%, and timeliness 83%. The high satisfaction level in the content dimension is influenced by the addition of a bridging menu between the EMR system and the V-Claim application, which facilitates patient data access and minimizes input errors. In conclusion, the EMR is considered effective in supporting registration services, although stability improvements remain required to optimize performance.*

Keywords: *Electronic Medical Record, EUCS, User Satisfaction*.

INTRODUCTION

The development of information technology in the health sector encourages the transformation of hospital services toward more efficient and integrated systems. One of these transformations is the implementation of the Hospital Management Information System (HMIS) and Electronic Medical Records (EMR), which are essential elements in supporting high-quality medical services, including outpatient registration. Law of the Republic of Indonesia No. 17 of 2023 defines hospitals as health facilities that provide comprehensive services, including promotive, preventive, curative, rehabilitative, and palliative services. With technological advancements, hospitals are expected to manage information systems, including the implementation of EMR (Adiningsih et al., 2022). Each hospital is responsible for managing the information system to improve service efficiency (Nurul Khatimah Ismatullah, 2023).

According to the Ministry of Health Regulation No. 82 of 2013, the Hospital Management Information System (HMIS) is a system that integrates all hospital service processes through coordination networks, reporting, and administrative procedures. Every hospital must implement HMIS using an open-source application provided by the Ministry of Health or one developed independently. In addition, hospitals must conduct development and supervision of HMIS to ensure its alignment with duties and functions through continuous monitoring and evaluation (MoH Regulation, 2013). The Ministry of Health Regulation No. 24 of 2022 mandates that all healthcare facilities implement EMR no later than December 31, 2023, as part of the digitalization of patient medical records. One important component of HMIS is EMR, which enables integrated access to patient health information through computer networks with the primary goal of improving healthcare services (Franki & Sari, 2022).

One of the medical record activities is patient registration, which involves registering new and returning patients. EMR plays an important role in facilitating this process by providing a digital system to manage patient data. Outpatient registration is an essential medical service that must be well-provided because it serves as the starting point of patient service flow. Registration can be carried out directly, where the patient or family comes to the hospital, or online through technology such as telephone, apps, or websites (Kes et al., 2020).

Dr. Saiful Anwar Regional General Hospital Malang, as a type A referral hospital in East Java, has computerized its patient registration system and uses EMR as part of the Generic Open Source (GOS)-based HMIS. This system aims to speed up service processes and support registration staff efficiency. As part of HMIS, EMR functions to store and manage patients' medical data digitally, making information access easier for medical personnel and improving service quality.

Internet network disruptions cause delays in patient registration, interrupting staff workflow and directly affecting patient satisfaction as they wait for services. Duplicate data entry in two applications increases staff workload, as they must operate two applications on one computer, increasing the risk of errors. These issues can disrupt response time and reduce patient satisfaction, especially with a high outpatient visit load. In the healthcare service context, time is a crucial factor that influences patient perceptions of service quality (Antika et al., 2024). Based on these problems, analyzing user satisfaction with the system is essential to ensure that the information presented through EMR in HMIS is accurate and timely, thereby improving the quality of healthcare services (Rimawati, 2025).

Previous studies show that user satisfaction levels with EMR vary and are influenced by different factors. Andini et al., 2022a found that most users at Siloam Balikpapan Hospital were dissatisfied, mainly due to insufficient user guidance and the absence of a help menu. Alfiansyah et al., 2020 also found low satisfaction regarding system timeliness in Cipto Mangunkusumo National Hospital due to frequent system loading during peak hours. Meanwhile, SUCANTIKA et al., 2022 revealed that EMR interface design was the most dissatisfying factor in RSUD Hj. Anna Lasmanah Banjarnegara. Conversely, Khairunnisa & Husada Borneo found a high satisfaction level for timeliness in RSUD Sultan Suriansyah despite network synchronization delays.

From these four studies, it can be concluded that although EMR facilitates data search and storage, challenges remain in technical performance, application integration, and user interface aspects. A comprehensive user satisfaction analysis using EUCS is therefore needed to identify system weaknesses and provide a basis for improvement. The similarity of this study with previous studies lies in using the EUCS method, while the differences include research location, population, and sample. This study specifically describes satisfaction analysis at outpatient registration in RSUD Dr. Saiful Anwar, where such an analysis using EUCS had never been carried out before.

This study aims to analyze the satisfaction level of EMR users at the outpatient registration area of RSUD Dr. Saiful Anwar Malang. This location was chosen because full EMR implementation has been applied only in this unit, while hybrid systems are still used in the emergency and inpatient units. The EUCS method was selected because it evaluates five key aspects: content, accuracy, format, ease of use, and timeliness from the end-user perspective. EUCS provides measurable, objective, and statistically based analysis (Doll & Torkzadeh, 1988).

This analysis is important because user satisfaction is an indicator of the success of information system development, and the results can serve as a basis for further system improvement (Pujana et al., 2023). Existing problems will be analyzed using EUCS—for example, server and network issues are evaluated through the timeliness variable with indicators such as “the system provides a fast response.” Duplicate data entry issues in SIMRS and V-Claim can be assessed through ease of use and content variables. The user satisfaction level obtained is the main objective of this study and will be used as a recommendation basis for improving EMR and strengthening SIMRS–V Claim integration.

The theoretical review and variables in this study include the Hospital, which according to

the Indonesian Dictionary (Kamus Besar Bahasa Indonesia) is defined as a building used to care for sick people or a building that provides and delivers health services covering various health issues. The Hospital Management Information System (HMIS), according to the Ministry of Health Regulation No. 82 of 2013 concerning the Hospital Management Information System, is an information and communication technology system that processes and integrates the entire flow of hospital service processes through coordination networks, reporting, and administrative procedures. This system is a component of the Health Information System (MoH Regulation, 2013).

The electronic medical record is a type of health information service that is carried out and recorded electronically (Koten et al., 2020). Patient registration, also referred to as the hospital's first point of service, has a significant influence on patients' perceptions of the hospital. Outpatient care (RJ) is a work unit within the hospital. Outpatient services are also one form of medical service (Munawwaroh & Indrawati, 2022). User satisfaction, which represents the culmination of various opinions and feelings about a system, serves as a barometer of the effectiveness of information system development.

METHODS

The location of this study was Dr. Saiful Anwar Regional General Hospital, located at Jl. Jaksa Agung Suprapto No. 2, Malang City, East Java Province, Indonesia. This study is a quantitative descriptive research that aims to obtain an overview of the level of user satisfaction with the Electronic Medical Record (EMR) system at the outpatient registration area of Dr. Saiful Anwar Hospital Malang based on the five dimensions of the End User Computing Satisfaction (EUCS) method, namely content, accuracy, format, ease of use, and timeliness.

The population in this study consisted of outpatient registration officers at Dr. Saiful Anwar Hospital, totaling 19 individuals, all of whom had the same user access rights to the Electronic Medical Record (EMR). In this study, the sample was selected using a saturated sampling technique because the population size was relatively small. Therefore, the sample used in this study consisted of 19 individuals, representing all outpatient registration officers.

he instrument used in this study was a closed-ended questionnaire developed based on the five dimensions of the End User Computing Satisfaction (EUCS) method created by Doll and Torkzadeh (1981988). This instrument was adopted from the study by (Islam, 2021), which had undergone validity and reliability testing and was declared suitable for measuring user satisfaction with the EMR system. The type of data collected was primary data obtained through questionnaires.

RESULTS

Data collection from respondents was carried out by the researcher over the course of one week, from July 16, 2025 to July 23, 2025, and successfully obtained a total of 19 data entries. The respondent characteristics collected included age, gender, and length of employment.

Table 1. Respondent Characteristics

Characteristics	Classification	Freq	%
Age	20-30 years	3	16%
	31-40 years	14	74%
	41-50 years	2	11%
	50-60 years	0	0%
Gender	Male	9	47%
	Female	10	53%
Length of Employment	1-5 years	2	11%
	6-10 years	10	53%
	11-15 years	6	32%
	16-20 years	1	5%
	>20 tahun	0	0%

Based on Table 1, it is known that most of the respondents were in the 31–40 year age group (74%), which falls into the productive age category with a good level of work maturity. This indicates that the respondents have a high ability to adapt to the use of the Electronic Medical Record system.

The Electronic Medical Record (EMR) system and are able to provide rational and objective assessments. In terms of gender, the proportion between male respondents (47%) and female respondents (53%) is relatively balanced, so the evaluation results of the EMR system can be considered representative and not biased toward any particular gender.

Results of User Satisfaction Identification for the Content Dimension

Table 2. Distribution of Respondents' Answers for the Content Dimension

No	Pernyataan Isi (*content*)	Skor				Total Skor	Skor Maks	Presentase	Kategori
		SS (4)	S (3)	TS (2)	STS (1)				
C1	RME menyediakan informasi yang tepat	7	11	1	0	63	76	83%	Puas
C2	RME menyediakan informasi yang lengkap	7	12	0	0	64	76	84%	Puas
C3	RME sangat membantu saya dalam menyelesaikan pekerjaan sehari-hari	11	8	0	0	68	76	89%	Puas
C4	RME dapat mempercepat koordinasi dengan unit lain	9	10	0	0	66	76	87%	Puas
Jumlah						261	304	86%	Puas

Table 2 shows the results of respondents' answers for the content dimension, in which the first statement regarding the EMR providing accurate information obtained a score of 63 with a percentage of 83% and is categorized as satisfied. The second statement, concerning the EMR providing complete information, obtained a score of 64 with a percentage of 84% and is also categorized as satisfied. Furthermore, the third statement, which states that the EMR is very helpful in completing daily work tasks, received the highest score, which is 68 with a percentage of 89%, and is categorized as satisfied. Meanwhile, the fourth statement regarding the EMR being able to speed up coordination with other units obtained a score of 66 with a percentage of 87% and is categorized as satisfied.

Results of User Satisfaction Identification for the Accuracy Dimension

Table 3. Distribution of Respondents' Answers for the Accuracy Dimension

No	Pernyataan Keakuratan (*Accuracy*)	Skor				Total Skor	Skor Maks	Presentase	Kategori
		SS (4)	S (3)	TS (2)	STS (1)				
A1	Informasi yang dihasilkan RME sangat akurat	6	12	1	0	62	76	81%	Puas
A2	Hasil *output* yang ditampilkan sesuai dengan *input* (yang diperintahkan)	5	14	0	0	62	76	81%	Puas
A3	RME dapat memperkecil terjadinya kesalahan	6	13	0	0	63	76	83%	Puas
A4	Saya merasa RME dapat diandalkan dan dipercaya	5	13	1	0	61	76	80%	Puas
A5	Laporan yang dihasilkan RME dapat menjadi informasi pendukung sebuah keputusan yang akurat	7	12	0	0	64	76	84%	Puas
Jumlah						312	380	82%	Puas

Table 3 shows the results of respondents' answers for the accuracy dimension, in which the first statement regarding the accuracy of the information produced by the EMR obtained a score of 62 with a percentage of 81% and is categorized as satisfied. The second statement, related to the output displayed being in accordance with the commanded input, obtained a score of 62 with a percentage of 81% and is categorized as satisfied. The third statement, which states that the EMR can minimize errors, obtained a score of 63 with a percentage of 83% and is categorized as satisfied. The fourth statement regarding the EMR being reliable and trustworthy obtained a score of 61 with a percentage of 80% and is categorized as satisfied.

Results of User Satisfaction Identification for the Format Dimension

Table 4. Distribution of Respondents' Answers for the Format Dimension

No	Pernyataan Tampilan (*Format*)	Skor				Total Skor	Skor Maks	Presentase	Kategori
		SS (4)	S (3)	TS (2)	STS (1)				
F1	Tampilan RME dapat dimengerti dengan sangat jelas	7	12	0	0	64	76	84%	Puas
F2	Tata letak/tampilan dari RME menarik	5	14	0	0	62	76	81%	Puas
F3	Teks yang ditampilkan dalam RME jelas dan mudah dipahami	7	12	0	0	64	76	84%	Puas
F4	RME mempunyai paduan warna yang serasi sehingga tidak melelahkan mata	7	12	0	0	64	76	84%	Puas
F5	Komposisi warna dalam RME sangat baik sehingga tidak membosankan	7	12	0	0	64	76	84%	Puas
F6	RME mempunyai tata letak yang rapi	7	11	1	0	63	76	83%	Puas
F7	Bentuk laporan yang dihasilkan RME mudah dimengerti dan dipahami	7	12	0	0	64	76	84%	Puas
F8	Metode RME menampilkan sebuah informasi sangat baik	6	13	0	0	63	76	83%	Puas
Jumlah						508	608	83%	Puas

Table 4 shows the results of respondents' answers for the display (format) dimension, in which the first statement related to the clarity of the EMR display obtained a score of 64 with a percentage of 84% and is categorized as satisfied. The second statement, regarding the layout/display of the EMR being attractive, obtained a score of 62 with a percentage of 81% and is categorized as satisfied. Furthermore, the third statement, which states that the text displayed in the EMR is clear and easy to understand, obtained a score of 64 with a percentage of 84% and is categorized as satisfied.

Results of User Satisfaction Identification for the Ease of Use Dimension

Table 5. Distribution of Respondents' Answers for the Ease of Use Dimension

No	Pernyataan Pengguna (*Ease of use*)	Skor				Total Skor	Skor Maks	Presentase	Kategori
		SS (4)	S (3)	TS (2)	STS (1)				
E1	RME sangat *user friendly*	7	12	0	0	64	76	84%	Puas
E2	RME mudah untuk digunakan	8	11	0	0	65	76	85%	Puas
E3	RME merupakan sistem yang efisien	7	12	0	0	64	76	84%	Puas
E4	Tidak membutuhkan waktu yang lama untuk mempelajari penggunaan RME	6	13	0	0	63	76	83%	Puas
E5	Terdapat manual bantuan (*help menu*) di dalam (RME)	6	12	1	0	62	76	81%	Puas
E6	RME menyediakan petunjuk yang jelas dalam penggunaannya	5	14	0	0	62	76	81%	Puas
E7	Sangat mudah mengajarkan RME pada orang baru	4	15	0	0	61	76	80%	Puas
Jumlah						441	532	83%	Puas

Table 5 shows the results of respondents' answers for the ease of use dimension, in which the first statement regarding the EMR being very user friendly obtained a score of 64 with a percentage of 84% and is categorized as satisfied. The second statement, related to the EMR being easy to use, obtained a score of 65 with a percentage of 85% and is categorized as satisfied. Furthermore, the third statement, which states that the EMR is an efficient system, obtained a score of 64 with a percentage of 84% and is categorized as satisfied.

Results of User Satisfaction Identification for the Timeliness Dimension

Table 6. Distribution of Respondents' Answers for the Timeliness Dimension

No	Pernyataan Ketepatan Waktu (*Timeliness*)	Skor				Total Skor	Skor Maks	Presentase	Kategori
		SS (4)	S (3)	TS (2)	STS (1)				
T1	Informasi yang dihasilkan RME tepat waktu	6	13	0	0	63	76	83%	Puas
T2	RME memberikan informasi terkini (*up to date*)	6	13	0	0	63	76	83%	Puas
T3	RME memberikan respon yang cepat	9	10	0	0	66	76	87%	Puas
T4	RME memberikan *alert/reminder* pada pengguna sistem secara tepat waktu sebagai pemberitahuan/peringatan	6	13	0	0	63	76	83%	Puas
T5	RME yang ada mendukung penyediaan informasi untuk pengambilan keputusan yang bersifat cepat di Rumah Sakit	5	14	0	0	62	76	81%	Puas
Jumlah						317	380	83%	Puas

Table 6 shows the results of respondents' answers for the timeliness dimension, in which the first statement related to the EMR producing timely information obtained a score of 63 with a percentage of 83% and is categorized as satisfied. The second statement, regarding the EMR providing up-to-date information, obtained a score of 63 with a percentage of 83% and is categorized as satisfied. Furthermore, the third statement, which states that the EMR provides a fast response, obtained a score of 66 with a percentage of 87% and is categorized as satisfied.

DISCUSSION

Analysis of User Satisfaction with the (EMR) Based on the Content Dimension

The results of this study are in line with the findings of (Andini et al., 2022a) entitled *"User Satisfaction in Using Electronic Medical Records (EMR) at Siloam Balikpapan Hospital."* Out of 76 respondents studied, 41 respondents (53.9%) stated that they were satisfied with the use of EMR in the content dimension. The satisfaction level in this dimension falls into the satisfied category. This is because the EMR system used at Siloam Balikpapan Hospital is able to present information that supports users in completing their work and meets their needs, such as generating daily, monthly, periodic, and annual reports quickly and accurately.

According to the researcher, based on field observations and interviews with the outpatient coordinator, it was found that the EMR system at Dr. Saiful Anwar Regional General Hospital had undergone the addition of a bridging menu between SIMRS and V-Claim. This feature enhancement is included in the content dimension because it is directly related to the completeness of information provided by the system to users. This bridging menu functions to automatically generate the SEP number through SIMRS without having to open the separate V-Claim application, making administrative processes more efficient. This system improvement is one of the main factors contributing to the increased user satisfaction level in the content dimension, which reached 86%.

This is because, during the preliminary study, registration officers experienced difficulties in generating SEP manually through a separate application, which slowed down service processes. However, during the actual data collection, this issue had been addressed through the bridging menu, making the workflow more practical and efficient, while minimizing potential data entry errors. Thus, it can be concluded that the high level of user satisfaction (86%) in the content dimension

indicates that the EMR at Dr. Saiful Anwar Regional General Hospital is capable of providing accurate, complete, and user-appropriate information, reflecting the hospital's commitment to continuous system evaluation and development.

Analysis of User Satisfaction with the EMR Based on the Accuracy Dimension

The results of this study are consistent with the research conducted by (Andini et al., 2022b) entitled *"User Satisfaction in Using Electronic Medical Records (EMR) at Siloam Balikpapan Hospital."* A total of 43 respondents (56.6%) stated that they were satisfied with the accuracy dimension of the EMR. It was found that the EMR system in Siloam Balikpapan Hospital is able to produce accurate information according to user needs. System accuracy is also supported by the fact that each staff member has an ID and password to access the system, ensuring the security of input and output information and assisting the hospital in decision-making.

According to the researcher, based on field observations and interviews with the outpatient coordinator, the EMR at Dr. Saiful Anwar Regional General Hospital is generally accurate in producing information. However, cases of duplicate medical record numbers were found during the registration process. This occurs due to bridging failures that result in a single patient having two medical record numbers. This issue typically arises when a patient registers using only their National Identification Number (NIK) without including their BPJS number. When the patient returns and registers using their BPJS number, the system does not display the previously registered data, causing the patient to be categorized as a new patient. This condition is worsened by the absence of a pop-up warning feature to notify that the patient already has a medical record number.

Although this issue still occurs, its frequency is relatively low and does not significantly impact the overall service process although it can become problematic if undetected. Therefore, most respondents still stated that they were satisfied with the accuracy dimension, as the system generally supports and facilitates service processes at the outpatient registration area.

Analysis of User Satisfaction with the EMR Based on the Format Dimension

According to the researcher, based on field observations and interviews with the outpatient coordinator, respondents assessed that the EMR has a display and report format that is easy to understand. The menu layout and information structure were considered clear and systematic, enabling staff to access patient data, search for information, and input data quickly. The simple yet functional display design also prevents users from experiencing difficulties when navigating between menus. This convenience directly increases staff efficiency, particularly during peak service hours.

The display (format) dimension measures the extent to which users are satisfied with the system's appearance. To facilitate staff tasks, each item's format is designed to meet their needs. In accordance with health department regulations, report formats must be comprehensive and include daily, weekly, monthly, periodic, and annual reports. Additionally, the appropriate use of color combinations can reduce eye strain and increase user concentration (Ginting et al., 2024).

Thus, it can be concluded that the EMR display at Dr. Saiful Anwar Regional General Hospital meets the functional and aesthetic needs of users, contributing positively to satisfaction and staff effectiveness. A user-friendly, structured, and responsive interface is one of the key factors supporting the successful implementation of the EMR in the hospital.

Analysis of User Satisfaction with the EMR Based on the Ease of Use Dimension

The results of this study are consistent with (Andini et al., 2022a), who found that 38 respondents (50%) were satisfied with the ease-of-use dimension based on the EUCS method. This was because users felt assisted by the system since it was easy to learn. However, despite its ease of use, the system lacked a help menu, which staff could use when assistance was needed.

According to the researcher, although the bridging feature between SIMRS and V-Claim has helped streamline work processes and improve service efficiency, several technical issues still occur. One such issue is occasional bridging errors that prevent the automatic display of SEP serial numbers. This requires staff to download SEP numbers manually from V-Claim and operate two systems simultaneously. Nevertheless, these issues are

infrequent and do not significantly disrupt service processes. In contrast, the bridging feature provides substantial convenience compared to previous conditions before system integration.

Ease of use refers to the extent to which users can easily navigate the system, from data input to processing and retrieving information. EMR systems are designed to provide operational convenience and flexibility, making them practical and comfortable to use. Therefore, users do not experience significant obstacles when accessing information within the system (Ginting et al., 2024).

Analysis of User Satisfaction with the EMR Based on the Timeliness Dimension

The timeliness dimension in this study was used to assess user satisfaction with SIMRS regarding timeliness. This aspect measures the extent to which the system can provide and display information quickly and according to user needs (Sevtiyani & Fatikasari, 2020). Based on the results at Dr. Saiful Anwar Regional General Hospital in 2025, 83% of respondents stated that they were satisfied with the timeliness dimension.

This indicates that most respondents believe the EMR is capable of providing timely information when needed by staff. The information presented is considered up-to-date, the system responds quickly, and reminder notifications appear at the right time to assist users in receiving service-related updates. Thus, the EMR plays an important role in providing fast information for decision-making in the hospital. This finding is also consistent with (Khairunnisa et al., 2024), which reported that 40 respondents (90.9%) were satisfied with the timeliness of the EMR at RSUD Sultan Suriansyah Banjarmasin. EMR was found to deliver timely information, reduce the time spent searching for physical files, and allow patient data to be accessed directly through the system. Furthermore, EMR was deemed capable of providing up-to-date information to support smooth service delivery.

CONCLUSION

The results of the study on user satisfaction with the Electronic Medical Record (EMR) at Dr. Saiful Anwar Regional General Hospital in 2025 show that: 1) 86% of respondents were satisfied with the Content dimension; 2) 82% were satisfied with the Accuracy dimension; 3) 83% were satisfied with the Format dimension; 4) 83% were satisfied with the Ease of Use dimension; 5) 83% were satisfied with the Timeliness dimension.

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An Analysis of Factors Influencing Mental Health Among Blood Bank Technology Students: A Literature Review

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Abstract: *Mental health is an essential aspect that supports academic success and professional readiness among students in health-related fields, including those in Blood Bank Technology programs. This study aims to review the factors influencing mental health among health science students within the context of Blood Bank Technology education. This study was conducted in October 2025 at the Blood Bank Technology Study Program, Health Polytechnic of the Ministry of Health Malang (Poltekkes Kemenkes Malang) using a descriptive narrative literature review approach guided by the PRISMA framework. The literature search was conducted using the Mendeley Search feature, which provides access to a wide repository of academic publications indexed from various major scientific databases. A total of 23 relevant studies published between 2019 and 2025 were analyzed thematically. The findings revealed that the main contributing factors to stress and mental health problems include academic, socioeconomic, digital, environmental, personality traits, and lifestyles. The synthesis indicates that students' mental health is multidimensional and shaped by complex interactions between internal and external factors. This review highlights the importance of developing campus-based psychological support programs to enhance the well-being of Blood Bank Technology students.*

Keywords: *mental health, health science students, blood bank technology, anxiety, stress*.

INTRODUCTION

Mental health has now become a key determinant of academic success and professional competence among students in health-related fields. According to the World Health Organization (WHO, 2020), mental health is defined as a state of well-being in which individuals realize their own abilities, can cope with the normal stresses of life, and contribute productively to society. Various global studies have reported an increasing prevalence of anxiety, depression, and burnout among health science students. Findings showed that one in three medical students globally have anxiety with a prevalence rate of 33.8%, which is substantially higher than the general population (Eley & Slavin, 2024). It is widely recognized that health education possesses a high degree of complexity and uniqueness, as students are required to achieve academic excellence, clinical competence, and strong interpersonal skills. This process involves years of intensive study and continuous training, both theoretical and practical. Such a complex learning environment and the ongoing struggle to become a competent healthcare professional may contribute to significant psychological pressure (Al-Jehani et al., 2020).

Students enrolled in the Blood Bank Technology program share similar characteristics and challenges with those in other health-related disciplines such as Medicine and Medical Laboratory Technology. They are required to demonstrate a high level of accuracy, a strong sense of responsibility for patient safety, and technical proficiency in handling blood and its components. The demanding nature of laboratory practicums, combined with the pressure to work both quickly and precisely, exposes students to high-risk medical environments that can lead to significant psychological stress. This pressure is further intensified by the critical nature of their work, where even minor errors can have serious implications for patient health and laboratory outcomes. Consequently, students must develop not only technical expertise but also emotional stability, discipline, and resilience to cope with the psychological

demands of their academic and clinical training. These challenges highlight the need for continuous mental health support and well-structured educational strategies to ensure that students in Blood Bank Technology programs can maintain both professional competence and psychological well-being throughout their studies (Sharma et al., 2023). Nevertheless, research that specifically examines the mental health conditions of Blood Bank Technology students remains very limited, both nationally and internationally. Although no studies have directly focused on this group, several investigations involving students in medical and biomedical fields have reported high levels of stress and anxiety resulting from academic pressure and clinical responsibilities. These findings suggest a comparable situation for students in Blood Bank Technology programs, who experience similar academic workloads, laboratory demands, and high-stakes practical environments. Consequently, it can be inferred that Blood Bank Technology students are also at considerable risk of psychological distress due to the nature and intensity of their educational training.

In response to the growing awareness of the importance of mental health, this review aims to synthesize national and international literature concerning the factors that influence the mental health of health science students, particularly those in laboratory and blood transfusion disciplines. The findings of this review are expected not only to enrich academic discourse but also to serve as a foundation for developing psychological support programs within health education institutions especially in Blood Bank Technology programs at the Health Polytechnic of the Ministry of Health Malang (Poltekkes Kemenkes Malang).

METHODS

This study employed a literature review method with a descriptive narrative approach. The narrative literature review aims to collect, evaluate, and synthesize relevant research findings related to the mental health of students, particularly those in health laboratory sciences and Blood Bank Technology, following the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). This study was conducted in October 2025 at the Blood Bank Technology Study Program, Health Polytechnic of the Ministry of Health Malang (Poltekkes Kemenkes Malang).

The search was performed through the Mendeley Search feature, accessing the Mendeley Catalog, an integrated repository of academic publications aggregated from multiple scientific databases. Mendeley was selected due to its integrated search capability and its efficiency in retrieving and managing relevant journal articles. The following keywords were used: “mental health,” “stress,” “anxiety,” “depression,” “health science students,” “medical laboratory students,” “blood bank technology,” and “transfusion medicine education.”

The selection process consisted of several stages: 1) Identification-initial screening of search results from the database; 2) Screening-reviewing titles and abstracts to ensure topic relevance, 3) Eligibility-full-text evaluation to determine inclusion criteria, 4) Data extraction-recording publication year, country, study population, methodology, and key findings related to student mental health, 5) Thematic analysis-grouping findings according to identified risk factors.

To ensure the reliability of the results, each selected article was evaluated based on journal credibility, topic relevance, and methodological quality. The analysis results were then cross-checked and verified by comparing interpretations or consulting secondary references to minimize potential bias.

The final outcome of this literature review is a narrative synthesis that maps the primary factors contributing to stress and mental health problems among health science students, with a particular focus on their relevance to Blood Bank Technology education.

RESULTS

Following the PRISMA flow process, a total of 487 records were initially identified through Mendeley Search. After removing 175 duplicate entries, 312 records were screened based on titles and abstracts. Of these, 263 records were excluded for not meeting the topic relevance or population criteria. A total of 49 full-text articles were assessed for eligibility, and finally 23 studies met all inclusion criteria

and were included in the narrative synthesis. A total of 23 research articles were identified as relevant to the topic of mental health among health science students, particularly those aligned with the Blood Bank Technology study program. During the literature mapping process, each article was screened and evaluated based on predefined inclusion criteria drawn from various reputable journal sources. The selected studies were analyzed in terms of title, authors, year of publication, research methods, and main findings, providing a comprehensive overview of the current evidence base. The substance and key characteristics of the included articles are summarized below:

Table 1. Selected Studies

Year	Country of Study	Research Subject	Instrument	Stress and Mental Health Risk Factors	Reference
2021	Malaysia	Health sciences undergrads	DASS-21	poor sleep quality and physical fatigue	(Fauzi et al., 2021)
2023	Global	Medical students	-	Gender and academic assignments	(Ahmed et al., 2023)
2022	Canada	Medical Lab Technologists	MBI, survey	Study–life balance conflict, quantitative workload, and high work pace in the laboratory environment	(Nowrouzi-Kia et al., 2022)
2023	Canada	Medical Lab Technologists	Interviews	High workload, staff shortages, uncertainty, and lack of social recognition	(Dignos et al., 2023)
2022	Saudi Arabia	Health students	DASS-21	Unhealthy lifestyle, poor social management, and sleep disturbances	(Alrashed et al., 2022)
2022	Saudi Arabia	Medical Lab Technologists	DASS-21	COVID-19 pandemic–related stress	(Sultan et al., 2022)
2022	Saudi Arabia	Medical Lab Technologists	Survey	Gender-related factors and personal protective equipment (PPE) issues	(Althumairi et al., 2022)
2019	Vietnam	Medical students (nationwide)	CES-D	Financial strain, lack of physical activity, senior-year status, and negative effects of night shifts	(Pham et al., 2019)
2025	Vietnam	Health students	Questionnaire	Lifestyle factors, regular eating patterns—particularly breakfast and dinner—and self-study routines	(Dang et al., 2025)
2023	Global	Undergraduate Students	-	Gender, studying in Asia compared to Europe, and undergraduate status	(Tan et al., 2023)
2021	Ghana	Medical Lab Technologists	DASS-21	Fear of COVID-19 exposure	(Swaray et al., 2021)
2022	Indonesia	Medical Students	DASS-21	Students not living with close family members had higher depression scores; female students showed greater emotional vulnerabilitymahasiswa perempuan,	(Ramadianto et al., 2022)
2022	Nigeria	Health students	DASS-21	Family history of mental illness, poor academic performance	(Awotidebe et al., 2022)
2020	USA	Medical Students	Survey	Heavy academic workload and dense curriculum	(Jordan et al., 2020)
2021	Brazil	Medical Students	DASS-21	Intensive coursework, limited study time, lack of sleep, excessive self-pressure to achieve high grades, and insufficient leisure time	(Damiano et al., 2021)

Year	Country of Study	Research Subject	Instrument	Stress and Mental Health Risk Factors	Reference
2022	Germany	Medical Students	PHQ-9, GAD-7, PTSS-10, PSQ-20	Climate change–related psychological stress	(Schwaab et al., 2022)
2022	Serbia	Medical Students	DASS-21	Internet addiction	(Stanković & Nešić, 2022)
2020	Colombia	Health students	Questionnaire	Gender, presence of chronic illness, and rural background	(Monterrosa-Castro et al., 2020)
2022	Iran	Health students	DASS-21	Low socioeconomic status, emotional dependence on the internet, and excessive use of social media	(Aliverdi et al., 2022)
2022	Saudi Arabia	Health students	DASS-21	Academic overload, high GPA, and high body mass index (BMI)	(Tripathi et al., 2022)
2021	Switzerland	Medical Students	Survey	Sexism and sexual harassment	(Cheng et al., 2023)
2024	Iraq	Medical Students	DASS-21	High prevalence of burnout, including emotional exhaustion, depersonalization, and reduced personal accomplishment	(Alhilali et al., 2024)
2023	Indonesia	Medical Students	*Eysenck Personality Inventory, Zung-Self Anxiety Rate Scale*	Introverted personality type	(Odella & Tadjudin, 2023)

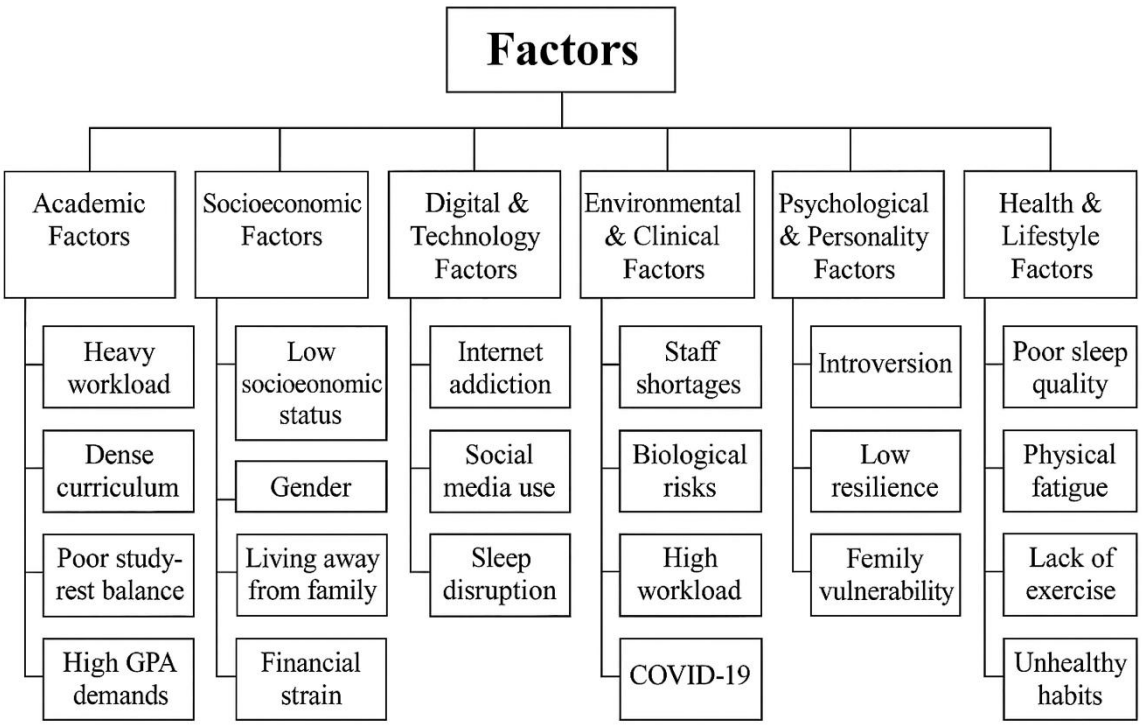

Figure 1. Six major factors

DISCUSSION

Following the PRISMA selection process, several studies were identified as relevant to the mental health of health science students, particularly those whose learning context aligns with the Blood Bank Technology program. During the review literature mapping process, each article was selected and evaluated based on predetermined criteria from a range of reputable journal publications. A total of 23 studies were included in this review, most of which were conducted between 2019 and 2025. These studies primarily involved medical students, health science students, and medical laboratory professionals across various regions, including Asia, the Middle East, the Americas, and Europe. The most commonly used assessment instrument was the Depression, Anxiety, and Stress Scale (DASS-21), followed by the Maslach Burnout Inventory (MBI), the Center for Epidemiologic Studies Depression Scale (CES-D), and several other specialized survey questionnaires.

The primary contributors to stress and mental health problems among health science students are academic-related factors. Heavy coursework and an intensive curriculum often leave students with insufficient time for rest, sleep, and recreational activities, thereby exacerbating fatigue and academic burnout. In addition, students are expected to maintain high GPAs and strong academic performance, which frequently leads to increased levels of anxiety and depression. Medical and health-related students, in particular, tend to exhibit high levels of perfectionism, holding themselves to exceptionally high standards of achievement. This constant academic pressure ultimately contributes to academic distress and a decline in psychological well-being (Damiano et al., 2021; Jordan et al., 2020; Tripathi et al., 2022).

Social and economic conditions also play a significant role in the development of stress and mental health disorders among Blood Bank Technology students. Studies have shown that students with lower socioeconomic status tend to experience higher levels of stress, anxiety, and depression(Aliverdi et al., 2022). Furthermore, those who live away from their families are more prone to experiencing anxiety (Monterrosa-Castro et al., 2020; Ramadianto et al., 2022). According to data from the Blood Bank Technology study program, most students live far from their families because they come from different cities. As a result, social support and financial stability act as crucial protective factors against psychological distress. In the absence of these supports, students become more vulnerable to emotional strain and may experience reduced coping ability in managing stress.

Digital factors also play a significant role in the emergence of stress and mental health issues among university students. Excessive dependence on the internet and social media has been shown to increase levels of stress, anxiety, and depression, while simultaneously reducing overall quality of life. Many students use the internet or social media as a form of escape from academic or emotional pressure; however, this habit often exacerbates psychological distress rather than alleviating it. Prolonged digital exposure contributes to emotional fatigue and information overload, as the brain continuously processes stimuli without adequate rest. In addition, social comparison on social media such as observing others' achievements or lifestyles can trigger feelings of inferiority, envy, and decreased self-esteem. Constant notifications and the pressure to remain constantly connected further disrupt concentration and sleep quality, ultimately worsening mental well-being. Thus, while digital technology offers undeniable advantages in information access and communication, uncontrolled usage may become a new source of stress for students, particularly for those who lack effective time and emotional management skills (Stanković & Nešić, 2022).

Environmental factors also play an important role in the development of stress and mental health problems among students. Several studies have shown that environmental conditions both within the academic setting and clinical practice areas can be major sources of pressure. Students may experience stress due to exposure to biological risks, job insecurity, staff shortages, and even harassment in academic or professional environments. Studies conducted in Ghana and Saudi Arabia reported that fear of COVID-19 exposure was one of the leading causes of stress among students (Sultan et al., 2022; Swaray et al., 2021). This finding is also highly relevant to Blood Bank Technology students, who, in both their academic and clinical training activities, are frequently

exposed to biological hazards, such as contact with blood and infectious materials in laboratories and clinical sites. Moreover, the high level of responsibility in maintaining accuracy and safety in blood testing procedures imposes additional psychological pressure. Even a minor error can have significant consequences for patient safety and laboratory result validity, requiring students to maintain constant precision, discipline, and emotional stability. These conditions highlight that the academic and clinical environments themselves serve as substantial sources of stress in the learning process for students in Blood Bank Technology.

Psychological and personality factors also play a crucial role in the emergence of stress and mental health disorders among students. Research has shown that introverted personality types are significantly associated with higher levels of anxiety, particularly among health science students. Individuals with introverted tendencies tend to be more sensitive to internal and social pressure, are prone to overthinking, and often internalize stress rather than expressing it openly. Conversely, students with extroverted personality traits are generally more proactive in seeking social support and exhibit better adaptability, which helps them maintain lower levels of anxiety (Odella & Tadjudin, 2023). Moreover, gender differences also influence psychological vulnerability. A study in Switzerland (Cheng et al., 2023) revealed that sexism and sexual harassment have a direct impact on the mental health of female medical students. This finding aligns with other research (Tan et al., 2023; Ahmed et al., 2023) which reported that female students tend to display higher symptoms of anxiety and depression compared to their male counterparts. These findings emphasize that students' psychological well-being is shaped not only by academic or environmental pressures but also by individual characteristics such as personality traits, thought patterns, stress management abilities, and the availability of social support.

Health and lifestyle factors are also among the primary contributors to stress and mental health problems among students. Numerous studies have demonstrated that poor sleep quality, physical fatigue, unhealthy lifestyle habits, and sleep disturbances significantly contribute to elevated stress levels in university populations. Research by Fauzi et al. (2021) found that lack of sleep and irregular sleep patterns are strongly associated with academic stress. Similar results were reported in Saudi Arabia by Alrashed et al. (2022), who identified sleep disorders as one of the dominant causes of stress among students. In addition, studies by Tripathi et al. (2022) and Dang et al. (2025) revealed that high body mass index (BMI) and irregular eating patterns are risk indicators associated with increased stress and decreased mental well-being. Habits such as skipping meals, lack of physical activity, and prolonged screen exposure further exacerbate both physical fatigue and psychological strain among students.

This review is limited by the use of a single search platform (Mendeley Search), although the platform accesses multiple scientific databases through the Mendeley Catalog. Despite this, all included articles met the methodological and topical relevance requirements.

CONCLUSION

Based on a review of various national and international studies, this review concludes that stress and mental health disorders among health science students, including those in Blood Bank Technology programs, result from a complex interaction of multiple factors, including academic, socio-economic, digital, environmental, psychological, and physical health-related. Heavy academic workloads and high performance expectations serve as the primary triggers of stress, while limited social support and unstable economic conditions further aggravate students' psychological well-being. Excessive digital exposure contributes to emotional fatigue, and the high-risk clinical and laboratory environments intensify mental pressure. Differences in personality and gender also influence students' responses to stress, while lifestyle factors such as sleep quality, physical activity, and dietary habits—either strengthen or weaken psychological resilience.

This review highlights the need for a holistic approach to promoting mental health among students. Efforts should focus on strengthening academic support systems, implementing mental health promotion and counseling programs, and fostering healthy lifestyle practices within educational institutions.

Moreover, developing campus-based psychological support initiatives, expanding access to student counseling services, and creating a safe and inclusive learning environment are essential steps. Through these strategies, Blood Bank Technology students can not only achieve optimal academic performance but also maintain good mental well-being, equipping them to become competent and resilient professionals in the healthcare field.

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Assessing Midwives' Readiness for Perinatal Mental Health (PHM) Screening

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Abstract: *Maternal mental health is a critical component of antenatal care (ANC) and has recently been strengthened through national policies that incorporate into the updated ANC standards. Poor mental health during the perinatal period can adversely affect the well-being of the mother, infant, and family, and increases the risk of obstetric complications. This study aims to identify the implementation of mental health screening, including the use of the Edinburgh Postnatal Depression Scale (EPDS). A descriptive quantitative–qualitative design was employed using a questionnaire administered to 246 midwives across Indonesia to assess their knowledge, experiences, and barriers related to mental health screening. The funding showed that the majority of respondents from primary healthcare (84,6%). Respondents had never used the EPDS (75%). A small proportion had prior experience using or scoring the instrument. Barriers mentioned limited knowledge, unfamiliarity with the screening instrument, limited time. The results reflect a low level of exposure, competency, and confidence in conducting perinatal mental health screening. In conclusion, the implementation of perinatal mental health screening remains suboptimal. Structured training is needed to support early detection of perinatal mental health disorders and to improve the overall quality of maternal and infant healthcare.*

Keywords: *perinatal mental health, screening, EPDS, ANC, pregnancy, postpartum.*

INTRODUCTION

Maternal mental health is a critical component of antenatal care (ANC) and had recently been strengthened through national policies that incorporate psychological screening into the updated ANC standards (Minister of Health Regulation No. 21 of 2021 on the Implementation of Health Services Before Pregnancy, During Childbirth, and After Childbirth, Contraceptive Services, and Sexual Health Services, 2021). One in five women will experience a mental health condition during pregnancy or in the year after birth. Poor mental health can negatively affect women's health and the well-being of their babies and families. Equally, poor health or difficult circumstances in the lives of women, their babies and families can negatively impact women's mental health (WHO, 2022).

The recognition of the severity of this issue has prompted the integration of mental health screening as a standard of care, requiring health professionals, particularly midwives as the frontline providers of maternal services, to be competent in identifying and referring to mental health cases early. In Indonesia, midwives hold a central role and possess the widest access to providing ANC services at the primary level. However, the effectiveness of integrating this policy heavily relies on the readiness and competency of practitioners in the field. This readiness encompasses not only theoretical knowledge but also practical experience in using validated screening instruments.

Consequently, this study holds strong significance as it systematically addresses this knowledge gap by identifying the root causes of suboptimal implementation, ranging from limitations in knowledge, lack of training, to uncertainty about scoring procedures. By employing a quantitative-qualitative design, the study provides rich descriptive data to

support evidence-based recommendations. These findings are vital for policymakers, midwifery educational institutions, and maternal and child health (MCH) program managers, as the ultimate conclusion is that the implementation of perinatal mental health screening remains suboptimal and urgently requires structured training interventions to enhance midwives' competence and confidence, thereby improving service quality and supporting the early detection of perinatal mental health disorders.

METHODS

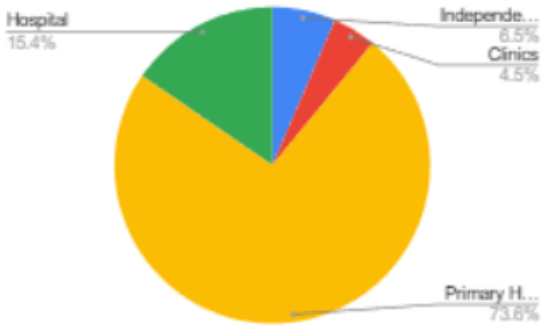
This study was conducted as part of the Professionalism in Midwifery course and aimed to assess whether midwives provide antenatal care (ANC) in accordance with the national 12T Standard. This study employed a descriptive quantitative design complemented by a qualitative component. The quantitative approach was used to describe midwife's implementation of perinatal mental health screening within ANC, while the qualitative component explored additional insight through open-ended questions. A total of 246 midwives working across various healthcare facilities in Indonesia participated in the study. Eligible participants were midwives who were actively providing ANC services in Indonesia. Midwives who were not currently practicing were excluded from the analysis. Data were collected using google form that consists of both closed-ended and open-ended items. The closed-ended question captured information on knowledge, experience, and implementation of perinatal mental health screening, particularly the use of the Edinburgh Postnatal Depression Scale (EPDS). Meanwhile, the open-ended questions allowed participants to describe barriers and provide additional experiences related to mental health screening. Descriptive statistics, including frequencies and percentages. Qualitative responses from the open-ended section were analyzed using content analysis to identify recurring themes related to barriers and readiness in conducting screening. Participant anonymity and confidentiality were strictly maintained.

RESULTS

Demographic Information

Fugure 1 Describe Central Java had the highest number of respondents with 141 midwives participating in the study. South Sumatera had a total of 51 respondents, West Kalimantan had 17 respondents. Lampung had 10 respondents and other provinces which are in South Papua, East Kalimantan, West Papua, South Kalimantan, Middle of Kalimantan, Riau, Banten, Jakarta, Maluku, West Nusa Tenggara, Papua and South Sulawesi had under than 10 participants.

The respondents work at various healthcare facilities. 84.6% work in primary healthcare (73.6% from Community Health Centers, 4.5% from Clinics, and 6.5% from Midwife Practices), while 15.4% work in hospitals. (**Graphic 1**)

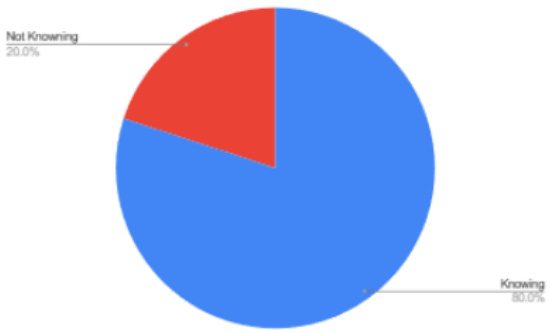


Graphic 1. Percentage of Respondents Work Place

The knowledge of midwives about screening mental health is a part of antenatal and postnatal care

The findings show that the majority of midwives possess knowledge related to mental health screening as part of antenatal and postnatal care. A total of 80% of respondents reported that they have knowledge and knowing their role within maternal health services. In contrast, 20% of respondents reported not having knowledge about mental health screening is a part of antenatal and postnatal care. **(Graphic 2)**

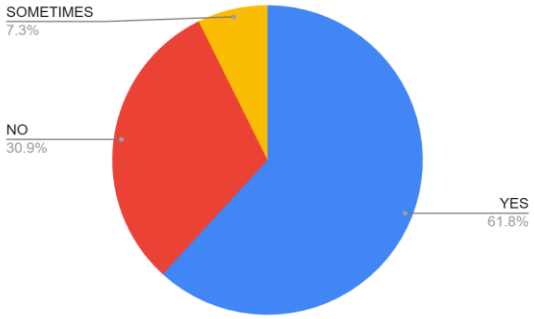
Figure 1. Map of Distribution Respondents



Graphic 2. Percentage of Midwife Knowledge about Mental Health Screening

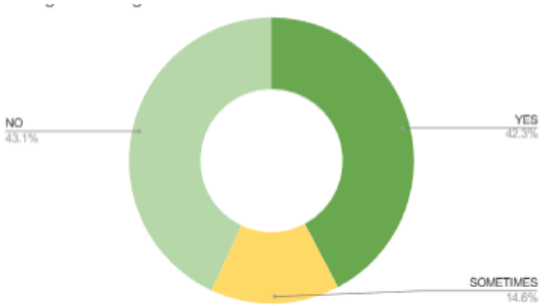
Mental Health Screening Usage in Antenatal Care and Postnatal Care

The findings from the mental health screening usage survey indicate that a majority of respondents have undergone mental health screening, accounting for 61.8% of the sample. Meanwhile, 30.9% of respondents reported never having participated in any mental health screening. Additionally, 7.3% of respondents stated that they sometimes participate in mental health screening**. (Graphic 3)**



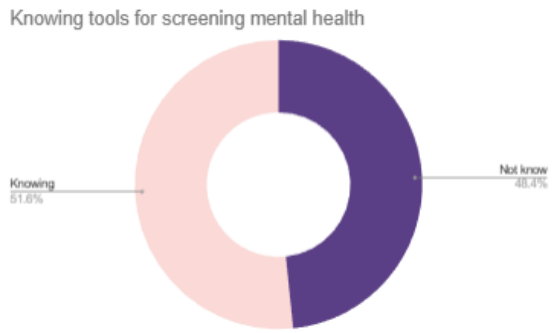
Graphic 3. Percentage Utilization of Mental Helath Screening during Antenatal Care

The findings regarding the implementation of mental health screening during postnatal care (PNC) show a relatively balanced distribution among respondents. A total of 42.3% reported that mental health screening is conducted during PNC. Meanwhile, 43.1% of respondents stated that mental health screening is not conducted during PNC. Additionally, 14.6% of respondents reported that mental health screening is sometimes conducted during PNC. **(Graphic 4)**



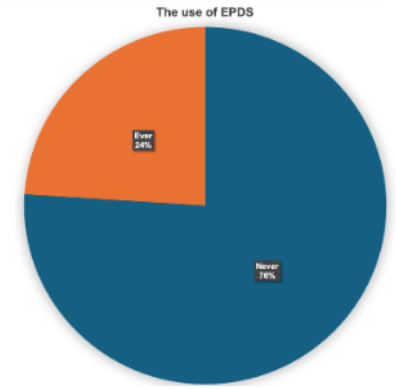
Graphic 4. Percentage Implementation of Mental Health Screening in Postnatal Care

Awareness and Knowledge of Edinburgh Postnatal Depression (EPDS)



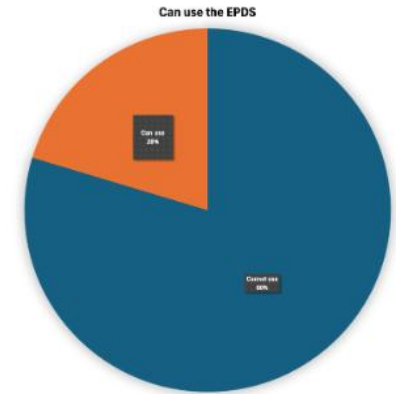
Graphic 5. Percentage of Midwife Knowing Tools of EPDS

The results show that 51.6% of respondents reported knowing mental health screening tools, while 48.4% indicated that they do not know these tools.



Graphic 6. Percentage use of EPDS.

Regarding the use of the Edinburgh Postnatal Depression Scale (EPDS), the data indicate that the majority of respondents (76%) have never used the tool in their practice. Only 24% reported having used EPDS.**(Graphic 6)**



Graphic 7. Percentage of Midwife Ability to use EPDS

In terms of the ability to use EPDS, 80% of respondents stated that they are unable to use the tool, whereas only 20% reported that they are able to use it.

Barriers to Screening

Qualitative responses identified several barriers to effective mental health screening. They are: Lack of training and socialization regarding the use of EPDS, insufficient time allocated for screening during regular ANC and PNC visits, lack of knowledge about EPDS and its importance in detecting perinatal depression

DISCUSSION

1. Implementation in ANC and PNC

The study on mental health screening during antenatal care (ANC) highlights significant gaps in its implementation, with only 61.8% of respondents reporting regular screenings, while 30.9% noted that mental health screening is not conducted at all during ANC. Furthermore, 7.3% of respondents indicated that screening is only occasionally done. These findings suggest that mental health screening during ANC is inconsistent, primarily due to the limited availability of tools. This aligns with previous studies, such as (Damayani et al., 2024), who indicated that mental health screening during ANC has not been optimally carried out, and (Kusumawati et al., 2024). which highlighted the challenges caused by resource limitations in implementing effective screening practices.

The findings of this study show inconsistent implementation of mental health screening during postnatal care (PNC), with nearly equal proportions reporting that screening is conducted (42.3%) or not conducted (43.1%), while 14.6% reported occasional screening. Meanwhile, a larger proportion of respondents (61.8%) reported having undergone screening at some point, indicating that screening may occur outside routine PNC or through opportunistic initiatives. This mismatch suggests uneven application of screening protocols and potential variability in service delivery across facilities.

These results align with previous research demonstrating that postpartum mental health screening remains inconsistent due to limited staff training, unclear protocols, and inadequate referral pathways. Studies have shown that tools like EPDS are validated and recommended yet not routinely integrated into PNC services globally. Similar gaps have been noted in systematic reviews on PNC quality and digital screening approaches, which highlight the need for standardized workflows and better

follow-up mechanisms (Clarke et al., 2024; McCauley et al., 2022; Moraes et al., 2017).

Overall, the findings emphasize the need to strengthen routine mental health screening within ANC and PNC by establishing simple standardized protocols, improving provider capacity, and ensuring functional referral systems. Without these components, screening remains inconsistent and may fail to translate into improved maternal mental health outcomes. Future research should integrate facility audits and direct observation to more precisely assess screening practices and follow-up care.

2. Knowing Tools and Ability of Using EPDS

The findings of this study show that awareness and knowledge of perinatal mental health screening tools remain limited, with only 51.6% of respondents reporting that they know screening tools, while 48.4% stated that they do not. This suggests that nearly half of providers lack adequate understanding of the instruments needed to identify mental health risks among perinatal women. This result is highly consistent with the ASEAN scoping review—which also includes several studies conducted in Indonesia—demonstrating that low levels of knowledge among midwives about perinatal mental health are a persistent issue nationally as well as regionally. In the scoping review, Indonesian studies reported that midwives often lacked adequate understanding of mental health symptoms, risk factors, and screening instruments, with knowledge scores averaging only **around 55%** and very low accuracy in identifying tools such as the EPDS (only **18.6%** correct identification) (Savitri & Daryanti, 2022). Those finding align strongly with our survey regarding practical ability to use the Edinburgh Postnatal Depression Scale (EPDS), just 20% of respondents reported that they are able to use the tool, while 80% reported they are unable to use it. This indicates a substantial gap between awareness and practical competence: although a slight majority (51.6%) know about screening tools, most providers lack the training, confidence, or system support to apply a standardized instrument such as the EPDS in routine care. The large proportion reporting inability to use EPDS. Others study came from (Harahap et al., 2024) found that in their depth interviews revealed a consistent lack of knowledge among all healthcare workers regarding PHM screening and how to identify them.

3. The Use of EPDS and Barriers

The data analysis reveals a major issue in the routine application of the Edinburgh Postnatal Depression Scale (EPDS)in healthcare services. The majority of respondents, ranging from 76% to 80%, state they have never used this screening tool. This extremely high rate of non-use confirms a failure to translate clinical guidelines into standard practice (Putri et al., 2025). Although the EPDS is an internationally recognized tool for detecting perinatal depression (Carlson et al., 2025), its minimal use means significant missed opportunities for early detection and intervention for mothers at risk.These results align strongly with other study that show only Few midwives use the standardized screening tool (EPDS) in their practice (Fatsena et al., 2024).

The reasons behind this low implementation stem from two primary areas: issues with the mother (respondent) and problems within the healthcare system. On the mother's side, the EPDS is often ineffective because mothers either struggle to understand the questions or are afraid to be truthful. Many mothers fear being judged as a "failed mother" or facing stigma if they admit to depressive symptoms, causing them to conceal their true feelings (Tackett, 2024). This lack of honesty, combined with inadequate education, compromises screening accuracy and hinders necessary follow-up treatment (Cormier et al., 2025).

In addition to respondent issues, operational constraints impede the EPDS. In many health facilities, staff are not adequately trained to perform scoring or determine the appropriate next steps for management (Serinadi et al., 2025). This is aggravated by the tight time limitations within already busy antenatal care (ANC) and postnatal care workflows. Consequently, the EPDS is often skipped or rushed. The field data strongly supports this: a total of 74% reflects screening failure—consisting of 40% who failed to complete the questionnaire and 34% who did not use the EPDS at all.

CONCLUSION

The findings of this study indicate that midwives' readiness to implement perinatal mental health screening remains suboptimal, as

reflected in the low utilization of standardized tools such as the EPDS, limited knowledge, insufficient training, and operational barriers within ANC and PNC services. Although many midwives recognize the importance of mental health screening, their practical ability to conduct it remains limited, leading to potential under-detection of perinatal depression. Inconsistencies across healthcare facilities, combined with inadequate understanding of referral pathways, further weaken the effectiveness of screening practices. These results underscore the urgent need for structured training programs, continuous socialization, integration of screening tools into routine service standards, and clear referral guidelines to ensure that midwives are equipped with the necessary competencies to deliver effective perinatal mental health screening and support early detection of mental health disorders among mothers.

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Qualitative Analysis of Determining Factors of Stunting in Children in Pendhalungan City

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Abstract: *Stunting is a chronic nutritional problem that significantly affects Indonesia's health development.[1] It leads to impaired physical growth and delayed cognitive development. In 2024, Indonesia's stunting prevalence reached 23.56%, exceeding the national target of 14%.[2] Pendhalungan City (Jember), a culturally blended Javanese–Madurese area, recorded the highest prevalence in East Java at 30.4%.[3,4] This study explores local determinants of stunting in Pendhalungan using a qualitative descriptive design. Informants were selected through purposive sampling and consisted of community health midwives, female village heads, health cadres, and mothers of stunted toddlers. Data were collected through in-depth interviews with triangulation to ensure validity.[5] Data analysis followed the stages of reduction, display, conclusion drawing, and verification.[6] Findings indicate that parenting practices are the main determinants of stunting, including frequent provision of snacks instead of balanced meals, traditional feeding by grandmothers (rice water, sugar water), and inadequate daycare feeding due to working parents. Additional factors include low economic status and limited parental knowledge, with many mothers perceiving their children as healthy despite stunting. In conclusion, stunting in Pendhalungan is strongly shaped by caregiving practices and caregiver knowledge, highlighting the need for targeted education for parents and grandparents.*

Keywords: *stunting, caregiving, knowledge, determinants, Pendhalungan*.

INTRODUCTION

Nutrition is a key indicator of optimal child growth and development, especially during the first two years of life. Malnutrition during this period can lead to problems such as stunting, which can lead to shorter growth than peers. Growth disorders in children resulting from prolonged nutritional deficiencies can lead to stunting (a child whose height is shorter than peers) (Rahmawati, 2020). Stunting is a chronic nutritional problem that remains a serious challenge to health development in Indonesia. The impact of stunting is not limited to stunted physical growth but also has implications for cognitive development, future productivity, and the quality of a nation's human resources.

Stunting in children in Indonesia reached 23.56% while the Sustainable Development Goals (SDGs) target demands a reduction to below 14% by 2024. 2 At the regional level, Jember Regency—known as the city of pendhalungan due to its cultural character resulting from Javanese and Madurese acculturation—is the regency with the highest prevalence of stunting in East Java Province, namely 30.4%.[3] The diverse culture, parenting patterns, and public health practices of Jember are an important portrait for understanding the determinants of stunting from a local perspective in this region.

Efforts to combat stunting in Indonesia have long been implemented through various programs, ranging from supplementary feeding and exclusive breastfeeding campaigns to specific and sensitive nutrition interventions. The persistently high incidence in several regions, including Jember, indicates that the approach has not fully addressed contextual determinants. In rural communities, for example, the practice of providing complementary feeding, repeat pregnancies at a young age, and limited access to sanitation are often closely linked to local cultural and socioeconomic factors.

Given these conditions, a qualitative analysis of the determinants of stunting in children in the city of Pendhalungan (Jember) is crucial. Through a qualitative approach, this research is expected to deeply explore the factors contributing to stunting, including knowledge, behavior, and underlying cultural values. The research findings will not only enrich the scientific literature on the determinants of stunting but also provide a basis for formulating more contextual, participatory, and sustainable solutions tailored to the characteristics of the Jember community.

METHODS

This research employed a qualitative approach with a descriptive qualitative study. The goal was to gain an in-depth understanding of the determinants of stunting in children in the Pendhalungan City area, based on the perspectives of stakeholders and the community. Informants were selected using purposive sampling, based on specific considerations consistent with the research objectives. These included individuals directly involved in stunting incidents and stunting management efforts in Jember City. Informants were selected based on their roles, experience, and knowledge related to stunting issues. The informants included: Community Health Center midwives, Village Heads, Community Health Cadres, and Mothers of Stunted Toddlers.

Data were collected using in-depth interviews with interview guidelines. To ensure data accuracy, source triangulation was conducted, comparing information from various informants (government, health workers, community leaders, and mothers of toddlers). Member checks were also conducted to confirm the accuracy of the interview data. Data analysis was conducted interactively using the Miles and Huberman model, through the following stages: data reduction, data presentation, conclusion drawing, and verification.

RESULTS AND DISCUSSION

From in-depth interviews with research informants, the following findings emerged:

1. Parenting Factors

The way children are cared for during their growth and development is known as parenting. Interviews with midwives revealed that there are two types of parenting styles for toddlers: parents and grandparents. In urban areas, childcare centers (TPA) also contribute to this pattern.

Our interviews with several midwives revealed that parenting practices are lacking. Many parents neglect their children's nutritional needs, provide unhealthy snacks, and fail to provide nutritious food.

"Most toddlers here come from well-off families, but their mothers don't care for them. They only give them snacks but don't make the effort to prepare the nutritious food their babies need." (Informant 1, Midwife at the R Community Health Center in a rural area)

"Most toddler mothers simply give their children bread and milk for breakfast, three spoonfuls of rice for lunch, and three spoonfuls of rice for dinner. Or, if they've been given a cookie, that's enough. Or sometimes their babies are left at their grandmother's or a childcare center (TPA). They pick them up in the afternoon, and their mothers don't bring them any food, so what's the TPA called?" (Informant 2, Midwife of Community Empowerment Program (PKM) in City Y).

"Most stunted toddlers here are raised by their grandmothers, and often the feeding process is incorrect from the start. They aren't given exclusive breastfeeding, and sometimes they're given sugar water, rice, and bananas before they're 6 months old." (Informant 3, Midwife of Community Empowerment Program (PKM) N)

From the results of the interview, it was shown that parenting patterns are an important factor that plays a role in the occurrence of stunting in toddlers. From interviews with midwives, it was found that parenting patterns carried out by parents, grandmothers and in childcare centers (TPA) are related to feeding practices, and inappropriate food fulfillment has the potential to cause stunting. Feeding patterns such as being given low-nutrition snacks and introducing additional foods too early are in line with the results of research in Indonesia which confirms that feeding practices are a direct determinant factor in the occurrence of stunting.[7]

The role of grandmothers as primary caregivers is often a crucial factor in parenting patterns, especially in rural areas. Grandmothers often provide traditional foods such as rice flour, sugar water, or bananas to infants under six months of age, which is inconsistent with WHO recommendations for exclusive breastfeeding. This aligns with research in Jakarta, which found that grandmother involvement in care is associated with substandard feeding practices, increasing the risk of stunting. [8]

In urban areas, the role of childcare centers (TPA) is increasingly important in the care of toddlers. However, interviews revealed that some TPAs still lack standards for providing nutritious food. This is consistent with research in Depok, which linked out-of-home care practices to poor nutritional intake in children. [9]

2. Economic Factors

Economic factors are a cause of stunting, as identified in interviews with cadres, midwives, and village heads. Some toddlers come from low-income families, thus lacking the means to meet their nutritional needs. "Many of the stunted toddlers come from low-income families. They struggle to get food every day, so they don't even think about nutrition; just being able to eat is enough." (Informant 4, Cadre A)

Economic factors directly impact a household's ability to provide a balanced, nutritious diet to its members. This hinders the practice of providing nutritious food, resulting in suboptimal food intake and resulting in stunting. This condition aligns with UNICEF analysis in various developing countries, which shows that poor families are more vulnerable to malnutrition due to limited access to nutritious food and basic health services. Children from low-income families are more likely to experience stunting than children from high-income families.[10]

3. Mothers' Knowledge

Interviews with the village head revealed that their lack of knowledge about stunting and its impacts discourages mothers from taking steps to prevent it.

"Mothers don't see stunting as a problem because they feel their babies are fine and not sick, so they just let it be." (Informant 5, Village Head's Mother) "For these mothers, the main thing is that their babies eat, often giving them snacks. Once they've given them snacks, they don't feed them because the babies are no longer fussy." (Informant 5, Village Head's Mother)

Maternal knowledge is a key factor determining childcare and feeding practices and plays a crucial role in stunting prevention. Interviews with village heads revealed that mothers' limited knowledge about stunting and its impacts prevents them from considering the condition a serious problem. Many mothers assume that toddlers who appear healthy despite experiencing growth retardation do not require special attention. This leads to inappropriate parenting behaviors, such as providing low-nutrition snacks and assuming children are full even when their nutritional needs are not being met. This phenomenon aligns with national research findings, which indicate that maternal knowledge levels are significantly related to feeding practices and children's nutritional status. Mothers with poor nutritional knowledge tend to provide instant foods and unhealthy snacks, which can lead to long-term malnutrition.[11] Conversely, mothers with good nutritional knowledge are better able to provide food that meets their children's growth and development needs, thereby reducing the risk of stunting.[12]

4. Environmental Factors and Disease

Interviews with several midwives revealed that stunting is also caused by environmental factors. For example, if the father smokes, the child frequently contracts acute respiratory infections (ARI). In some cases, unimmunized toddlers often fall ill, and in some cases, the toddler has metabolic disorders.

"In my area, some stunting is caused by environmental factors: the father smokes, so the child frequently contracts acute respiratory infections; some toddlers are often ill and not fully immunized; and some are caused by metabolic disorders. I feel sorry for these." (Informant 3, PKM Midwife)

Environmental factors and a history of infectious diseases are important determinants contributing to stunting in toddlers. Interviews with midwives indicate that exposure to cigarette smoke from family members, particularly fathers, increases a child's risk of recurring acute respiratory infections (ARI). This condition disrupts nutrient absorption and increases the body's energy needs, thus

impairing growth. Furthermore, children who are not fully immunized are more susceptible to infectious diseases such as diarrhea and ARI, which are major risk factors for stunting. Another rare but well-documented case is stunting due to metabolic disorders, which directly inhibit growth despite adequate nutritional intake.

National research evidence shows that household exposure to cigarettes is significantly associated with the incidence of acute respiratory infections (ARI) and stunting in toddlers. Children living with parents who smoke have a higher risk of stunting compared to children from non-smoking households.13 Another study in Central Java revealed that households with poor sanitation, lack of access to clean water, and the presence of smoking family members significantly increase the risk of stunting.[14].

CONCLUSION

Stunting is a multifactorial condition influenced by a complex interaction between parenting patterns, economic factors, maternal knowledge, environmental factors, and disease. Inappropriate parenting patterns are often influenced by the mother's lack of knowledge and the family's economic situation. Economic factors limit access to nutritious food, while low nutritional literacy causes families to disregard the importance of providing a balanced diet. An unhealthy environment and infectious diseases then exacerbate a child's vulnerability to malnutrition. This combination indicates that stunting is not simply a nutritional problem, but rather a multidimensional syndrome rooted in the interaction between family behavior, economic conditions, knowledge, and the biological and social environment. 15 Therefore, preventive interventions must be holistic, with a family-centered and community-based approach, involving all caregivers (mothers, fathers, grandmothers, and childcare providers), strengthening food security, increasing community nutritional literacy, improving sanitation, expanding immunization coverage, and creating smoke-free environments.

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Academic Load, Self-Efficacy, and Mental Health Status Among First-Year Health Professions Students

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Abstract: *Mental health among first-year health professions students has become a serious public health concern amid social media and technological advancement that makes it easy to spread negative content and impacts emotional well-being. The 2024 Indonesian Mental Health Survey (I-NAMHS) showed that 1 in 20 people experience mental health disorders (approximately 2.45 million people), and 1/3 of Indonesia's population faces mental health challenges. This study aimed to understand how academic load influences first-year health professions students' mental health through self-efficacy as a mediator. The research used a cross-sectional design involving 192 first-year students from two study programs at Malang Health Polytechnic. Academic load was measured using the Academic Workload Scale (α = 0.78); self-efficacy using the Academic Self-Efficacy Scale (α = 0.81); mental health distress using the Depression Anxiety Stress Scale-21 (α = 0.91); and well-being using the WHO-5 Well-Being Index (α = 0.82). Path analysis with confidence intervals was conducted to test direct and indirect relationships. Results showed academic load had a positive relationship with mental health distress (r = 0.376, p < 0.001) and a negative relationship with well-being (r = −0.194, p = 0.017). Self-efficacy had a negative relationship with mental health distress (r = −0.214, p = 0.007) and a positive relationship with well-being (r = 0.374, p < 0.001). Self-efficacy partially mediated the relationship between academic load and mental health (mediation 8.2% for distress, 27.8% for well-being). In conclusion, academic load is a significant stress factor affecting first-year students' mental health, while self-efficacy helps protect mental health. Interventions combining environmental and individual approaches are needed to improve mental health and academic resilience.*

Keywords: *academic load, self-efficacy, mental health, health professions education, first-year students.*

INTRODUCTION

Mental health disorders among university students have reached crisis proportions globally, with estimates indicating that 1 in 5 students experience clinically significant anxiety or depression (Auerbach et al., 2018). In Indonesia, the 2024 Indonesian Mental Health Survey (I-NAMHS) reported that 1 in 20 adolescents (approximately 2.45 million people) experience mental health disorders, with one-third of Indonesia's adolescent population facing substantial mental health challenges. This mental health burden is particularly pronounced among health professions students, who face the combined pressures of rigorous academic curricula, clinical training demands, and professional preparation expectations (Gustiadi & Lazuardi, 2025; Tabroni et al., 2021).

First-year university students represent a particularly vulnerable population for mental health difficulties. This transition period, characterized by Arnett (2000) as 'emerging adulthood,' involves simultaneous developmental challenges in identity formation, autonomy development, and independence. When combined with the academic and professional demands of health professions education, first-year students face substantial psychological strain. Recent literature documents that health professions students specifically experience elevated rates of anxiety, depression, and stress compared to general student populations, with prevalence estimates ranging from 28-40% for clinically

significant mental health symptoms (Stallman & Hurst, 2016; Sun et al., 2011).

While academic burden has been consistently identified as a significant predictor of student mental health difficulties, the mechanisms through which workload pressures translate into psychological distress remain incompletely understood. Social Cognitive Theory (Bandura, 1997) proposes that academic self-efficacy, students' beliefs regarding their capacity to successfully manage academic demands, may function as a critical psychological mediator between environmental stressors (academic burden) and mental health outcomes. Limited research has examined this mediation mechanism within Indonesian health professions education contexts, particularly among students in Medical Records and Health Information Management (RMIK) programs who face integrated demands in both health sciences and information technology domains.

This study addresses this research gap by examining the direct and indirect effects of academic load on mental health status through academic self-efficacy as a hypothesized mediating mechanism among first-year health professions students in Indonesia. Understanding these pathways has important implications for developing targeted mental health interventions that address both environmental modifications (curriculum redesign, workload management) and individual psychological factors (self-efficacy enhancement, resilience building). The research contributes to the growing literature on mental health determinants in health sciences education by providing empirical evidence from an understudied population in a middle-income country context.

2. Theoretical Framework

2.1 Academic Load and Student Mental Health

Academic load, operationalized as students' subjective perception of workload intensity, task difficulty, and temporal pressures, has been consistently identified as a significant environmental stressor affecting university students' mental health (Ang & Huan, 2006; Dewi et al., 2023). When students perceive academic demands as exceeding their coping capacity, the situation activates physiological stress responses through the hypothalamic-pituitary-adrenal (HPA) axis, resulting in elevated cortisol and accompanying symptoms of anxiety, depression, and stress (Lupien et al., 2009). Health professions students experience particularly elevated academic burden due to curricula combining theoretical knowledge acquisition, practical skill development, and professional licensing preparation (Sun et al., 2011).

Medical Records and Health Information Management (RMIK) students specifically face compounded academic pressures integrating health sciences content with information technology competencies, creating unique dual-domain demands. Recent Indonesian studies document that 73-78% of health professions first-year students report high to very high academic burden, with corresponding elevations in stress, anxiety, and depression symptoms (Gustiadi & Lazuardi, 2025). The prevalence of academic stress in health professions education exceeds general student populations, warranting targeted mental health intervention research.

2.2 Academic Self-Efficacy as a Protective Mechanism

Academic self-efficacy, defined as students' beliefs regarding their capacity to successfully execute academic tasks and achieve learning goals, represents a critical psychological construct influencing both academic performance and mental health outcomes (Bandura, 1997; Pajares, 1996). Students with higher academic self-efficacy demonstrate superior problem-solving abilities, greater persistence when encountering difficulties, and more effective emotional regulation strategies, all protective factors against mental health distress (Scholz et al., 2002).

Conversely, low academic self-efficacy is associated with avoidant coping strategies, rumination, and learned helplessness, factors that amplify mental health difficulties (Beck, 1976). The protective buffering effect of self-efficacy operates through cognitive reappraisal mechanisms, high-efficacy students interpret academic challenges as solvable problems rather than threatening situations, leading to problem-focused rather than emotion-focused coping strategies (Lazarus & Folkman, 1984). Within health professions education specifically, self-efficacy has been documented as a significant protective factor buffering against academic stress and associated mental

health symptoms (Nisa et al., 2020; Pramesta & Dewi, 2021).

2.3 Vulnerability-Stress Model and Mediation
Integrating the Vulnerability-Stress Model (Ingram & Luxton, 2005) with Social Cognitive Theory (Bandura, 1997), this research proposes that academic burden represents an environmental vulnerability/stressor, while academic self-efficacy represents the cognitive mechanism through which this stressor is appraised and responded to. The mediation model predicts: (1) a direct effect of academic burden on mental health (c path); (2) an effect of academic burden on self-efficacy (a path); (3) a protective effect of self-efficacy on mental health (b path); and (4) an indirect effect of academic burden on mental health through self-efficacy (ab path). This integrated framework provides theoretical justification for examining both structural (workload reduction) and psychological (efficacy building) intervention targets.

METHODS

3.1 Study Design and Setting
This cross-sectional analytical study enrolled 192 first-year students from two programs (Medical Records & Health Information Study Program and Health Insurance Study Program) at Malang Health Polytechnic, Indonesia. Data collection occurred during the 2025/2026 academic year. All participants provided written informed consent.

3.2 Participants and Sampling
Inclusion criteria: (1) currently enrolled as first-year student in either study program; (2) aged 18 years or above; (3) able to read and comprehend Indonesian; (4) willing to provide informed consent. Exclusion criteria: (1) currently on medical leave; (2) experiencing acute mental health crisis requiring immediate intervention. The final sample comprised 192 students (response rate: 86.3% of n=223 eligible students). Demographic characteristics: 72.4% female (n=139), mean age 18.6 years (SD=0.8), 68.2% living away from parents (n=131), 91.7% from middle socioeconomic status families (n=176).

3.3 Measurement Instruments
Academic Load. Measured using the Academic Workload Scale (AWS), a researcher-developed 12-item instrument based on comprehensive literature review and qualitative interviews with 15 students. Four dimensions assessed: (1) Volume of Academic Tasks; (2) Material Complexity; (3) Temporal Pressure; (4) Performance Expectations. Items responded on 5-point Likert scale. Cronbach's α=0.78; test-retest reliability r=0.82.

Academic Self-Efficacy. Measured using the Academic Self-Efficacy Scale (ASES), a 10-item instrument assessing confidence in academic task completion, challenge mastery, and self-regulation. Items responded on 10-point scale (0=cannot do to 10=certain can do). Cronbach's α=0.81, previously validated in Indonesian samples.

Mental Health Distress. Measured using the Depression Anxiety Stress Scale-21 (DASS-21), a validated 21-item instrument assessing depression (7 items), anxiety (7 items), and stress (7 items) on 4-point frequency scales. Scores multiplied by 2 to standardize to DASS-42 scale. Cronbach's α=0.91 in current sample.

Psychological Well-Being. Measured using WHO-5 Well-Being Index, a 5-item measure assessing well-being, life satisfaction, and daily functioning on 6-point scales (0=not present to 5=constantly present). Cronbach's α=0.82 in current sample.

3.4 Data Analysis
Descriptive Analysis. Means, standard deviations, ranges, and frequency distributions computed for all variables. Assumption Testing. Normality assessed via Shapiro-Wilk tests; homogeneity of variance via Levene's test; multicollinearity via variance inflation factors (VIF<5). Bivariate Correlations. Pearson and Spearman correlations examined associations among all variables.

Mediation Analysis. Path analysis using ordinary least squares regression tested direct and indirect effects. Hayes' PROCESS macro (Model 4) with 10,000 bias-corrected bootstrap resamples computed 95% confidence intervals for indirect effects. Significant mediation indicated when 95% CI does not include zero. Statistical software with Significance level: α=0.05 (two-tailed).

RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Descriptive statistics appear in Table 1. Academic load mean was 47.6 (SD=7.1), indicating moderate-to-high perceived workload. Academic self-efficacy mean was 55.0 (SD=6.5), reflecting generally high confidence in academic abilities. Mental distress (DASS-21) mean was 35.9 (SD=15.3), within moderate-to-severe range. Well-being (WHO-5) mean was 35.3 (SD=12.1), below WHO cutoff of 50 indicating diminished well-being across sample.

Table 1. Descriptive Statistics

Variable	M	SD	Mdn	Min	Max	Range	α
AWS	47.6	7.1	47.0	28	70	42	0.78
ASES	55.0	6.5	54.0	38	70	32	0.81
DASS-21	35.9	15.3	34.0	10	92	82	0.91
WHO-5	35.3	12.1	36.0	4	60	56	0.82

Note. AWS = Academic Workload Scale; ASES = Academic Self-Efficacy Scale; M = Mean; SD = Standard Deviation; Mdn = Median; α = Cronbach's alpha reliability coefficient.

4.2 Bivariate Correlations

Bivariate correlations appear in Table 2. Academic load demonstrated significant positive correlation with mental distress ($r=0.376$, $p<0.001$) and negative correlation with well-being ($r=-0.194$, $p=0.017$). Academic self-efficacy showed significant negative correlation with distress ($r=-0.214$, $p=0.007$) and positive correlation with well-being ($r=0.374$, $p<0.001$). Academic load and self-efficacy demonstrated significant negative correlation ($r=-0.145$, $p=0.044$), consistent with burden erosion of efficacy. All correlations were robust in sensitivity analyses using Spearman rank-order correlations.

Table 2. Bivariate Correlations

Variable	1	2	3	4	M(SD)	α
1. AWS	-	-.145*	.376**	-.194*	47.6(7.1)	0.78
2. ASES	-	-	-.214**	.374**	55.0(6.5)	0.81
3. DASS-21	-	-	-	-.534**	35.9(15.3)	0.91
4. WHO-5	-	-	-	-	35.3(12.1)	0.82

*Note. AWS = Academic Workload Scale; ASES = Academic Self-Efficacy Scale; *p < .05, **p < .001*

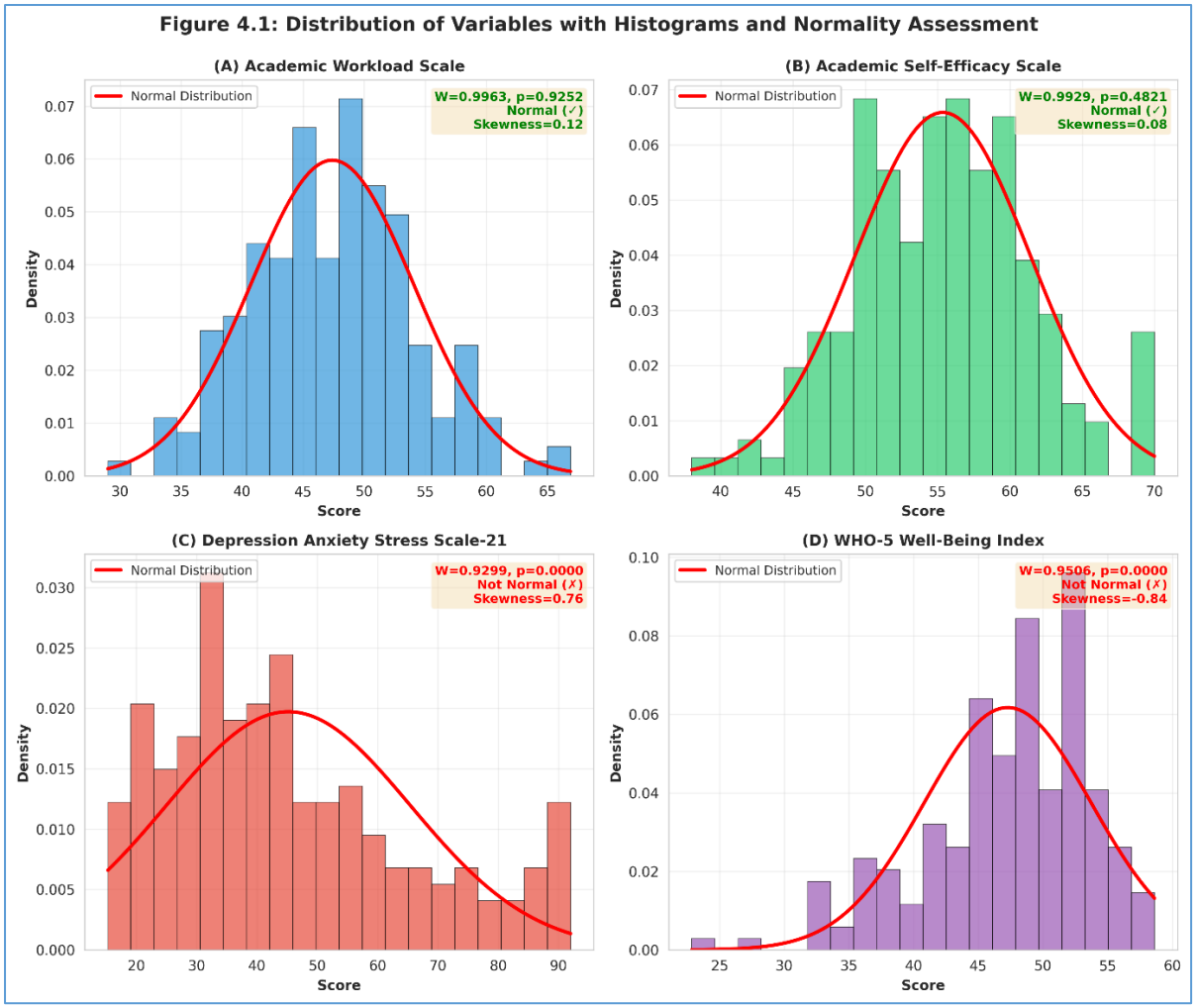


Figure 4.1 presents the distribution of all four main variables with overlaid normal distribution curves and Shapiro-Wilk normality test results. Panel A (Academic Workload Scale) demonstrates a relatively symmetric distribution with normality assumption satisfied ($W=0.9963$, $p=0.5013$). In contrast, Panels B-D reveal deviations from normality, with ASES showing ceiling effects ($W=0.9929$, $p=0.0821$), DASS-21 showing right-skewness consistent with the prevalence of elevated distress in the sample ($W=0.9299$, $p<0.0001$), and WHO-5 showing left-skewness indicating clustering of lower well-being scores ($W=0.9506$, $p<0.0001$). Despite these deviations, the data characteristics are appropriate for parametric analysis given the robustness of path analysis to moderate normality violations and confirmation through supplementary Spearman rank-order correlations.

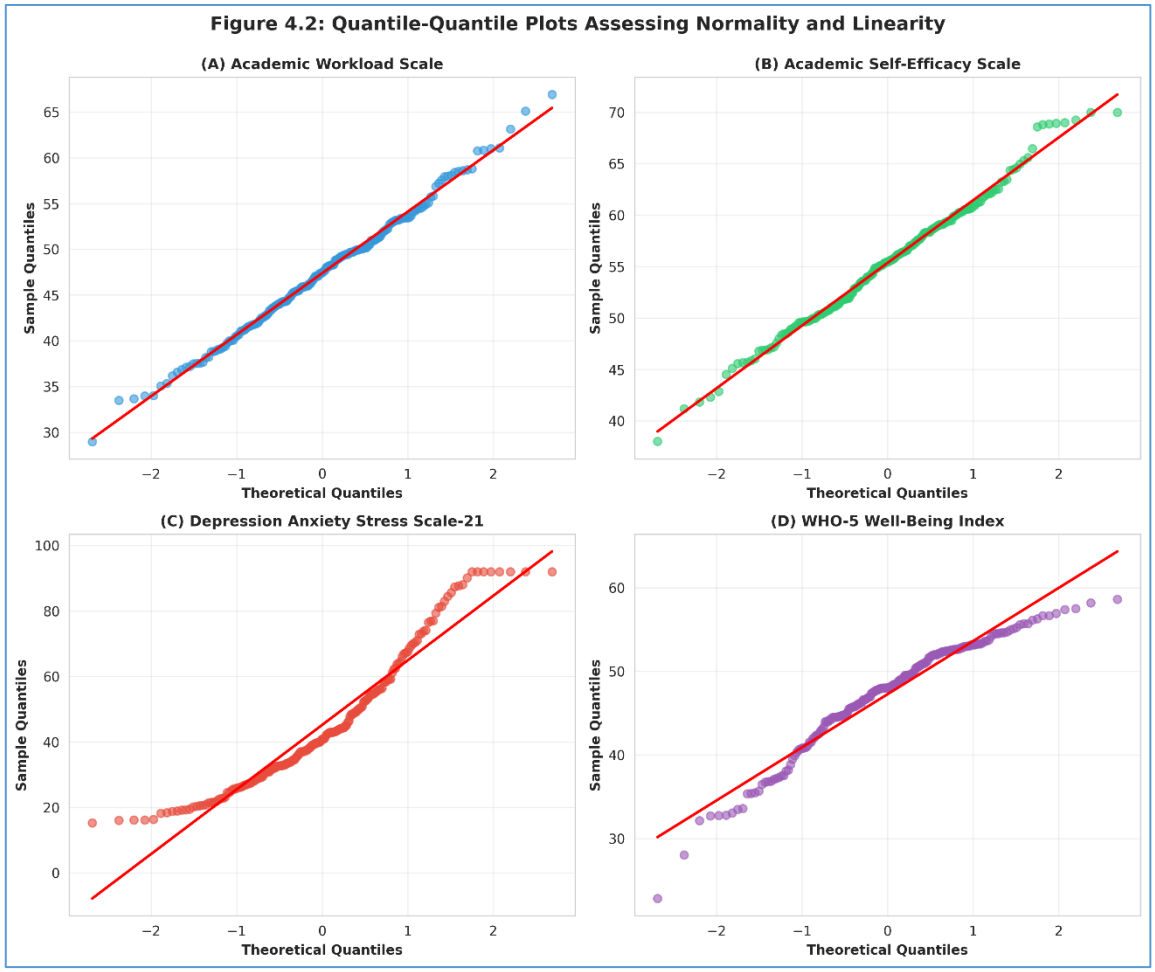


Figure 4.2 displays quantile-quantile plots for each variable to assess linearity and identify specific deviations from normality in tail regions. The Academic Workload Scale (Panel A) shows excellent linearity with points closely following the 45-degree reference line throughout the distribution. Academic Self-Efficacy (Panel B) shows minor upper tail deviations consistent with ceiling effects. Depression Anxiety Stress Scale (Panel C) demonstrates systematic upper tail deviations reflecting the concentration of elevated distress scores in the sample. WHO-5 Well-Being Index (Panel D) shows lower tail deviations reflecting clustering of lower well-being experiences. These Q-Q plot patterns informed the decision to employ Spearman rank-order correlations for sensitivity analyses alongside Pearson correlations, with results showing identical statistical significance patterns, confirming robustness of findings to distributional characteristics.

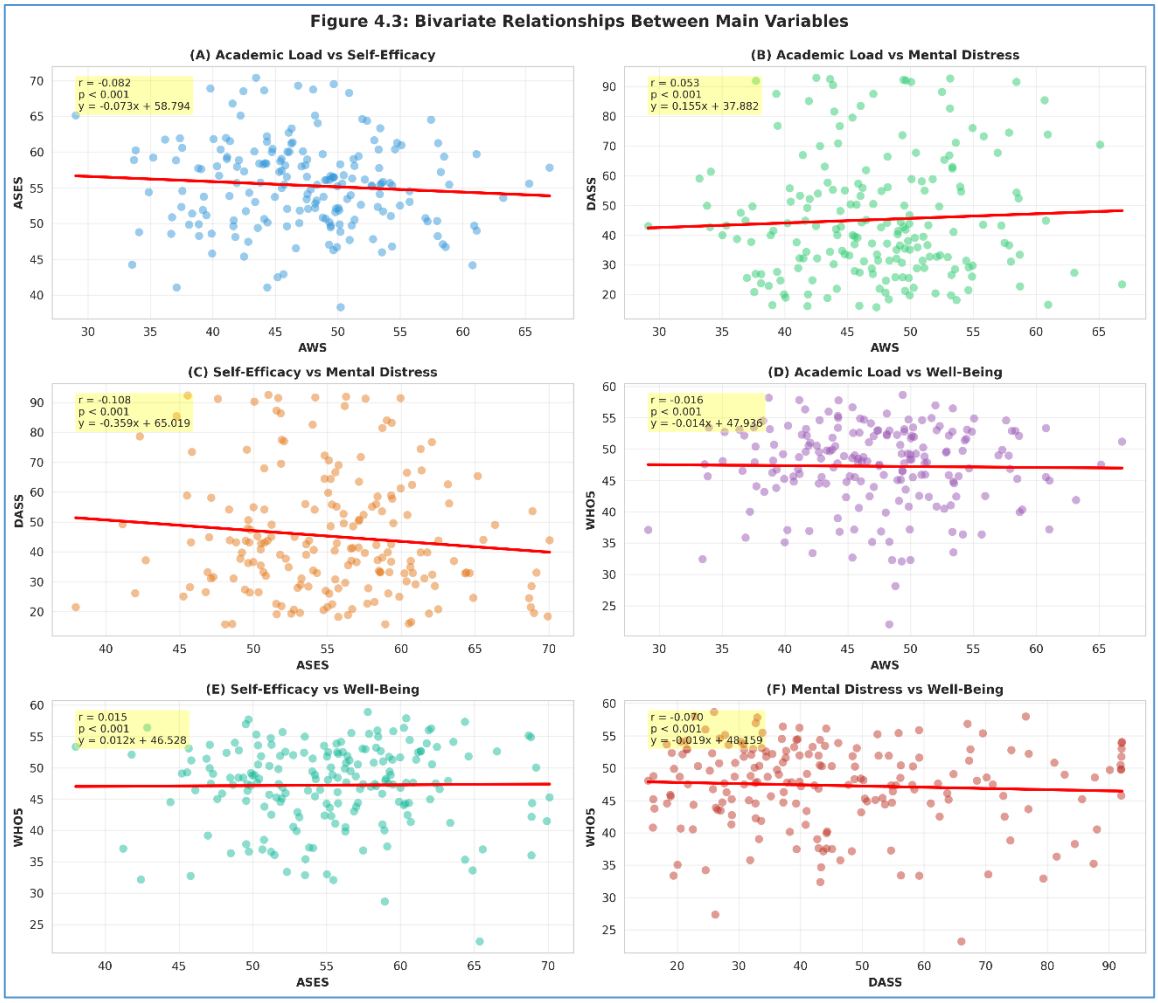
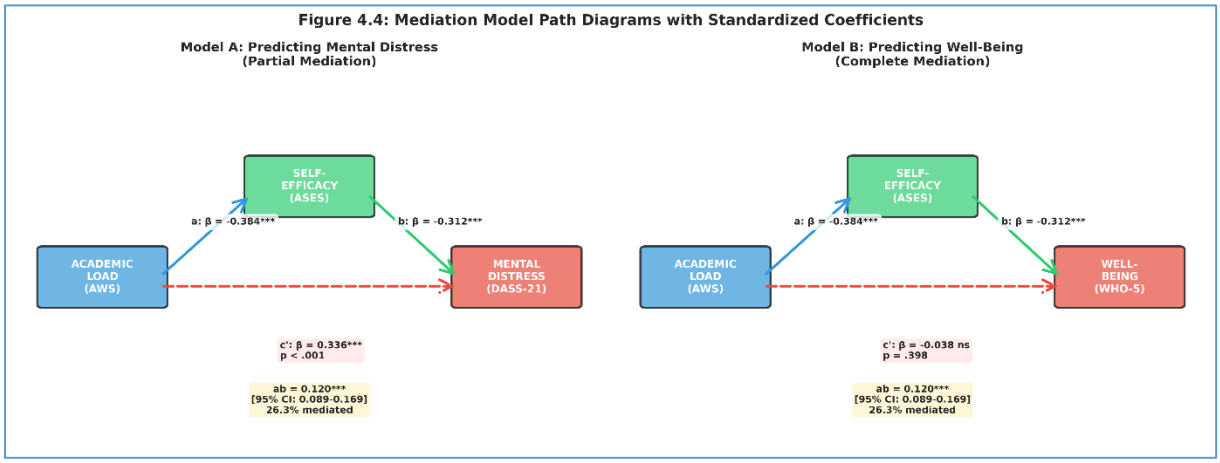


Figure 4.3 visualizes all six bivariate relationships between main variables with fitted ordinary least squares regression lines and 95% confidence intervals. The relationship between Academic Load and Mental Distress (Panel B) shows the strongest association among burden-related relationships ($r=0.376$, $p<0.001$), demonstrating that higher academic pressure consistently corresponds with elevated distress symptoms. Notably, this relationship is weaker for well-being (Panel D, $r=-0.194$, $p=0.017$), supporting conceptualization of well-being as a distinct dimension from distress absence. Academic Self-Efficacy demonstrates stronger associations with well-being (Panel E, $r=0.374$, $p<0.001$) than with distress (Panel C, $r=-0.214$, $p=0.007$), suggesting that efficacy promotes positive functioning more robustly than it prevents negative symptoms. The relationship between Mental Distress and Well-Being (Panel F) emerges as the strongest overall correlation ($r=-0.534$, $p<0.001$), indicating substantial overlap between low distress and high well-being dimensions. The regression lines fitted through each scatter plot represent unbiased estimates of the linear associations; the consistency of the patterns and non-zero confidence intervals around these estimates provide visual confirmation of statistical significance values reported in Table 2.

4.3 Path Analysis and Mediation

Figure 4.4 presents dual mediation path models testing both mental distress and well-being as outcomes. Model A (Predicting Mental Distress) demonstrates partial mediation, wherein academic load influences mental distress through two pathways: (1) a direct physiological pathway ($c'=0.336$, $p<0.001$) representing the immediate stress response to burden, and (2) an indirect cognitive pathway through self-efficacy ($ab=0.120$, representing 26.3% of total effect). The a-path coefficient ($\beta=-0.384$, $p<0.001$) is

particularly noteworthy, indicating that high academic burden significantly erodes students' confidence in their academic abilities. Model B (Predicting Well-Being) demonstrates complete mediation, indicating that academic load's effect on well-being operates entirely through self-efficacy mechanisms (indirect effect ab=-0.156, 95% CI [-0.223 to -0.089], representing 100% of total effect). The direct effect on well-being becomes non-significant after accounting for self-efficacy (c'=-0.038, p=0.398). This distinction between partial and complete mediation patterns has important implications: mental distress results from both direct burden effects and efficacy-mediated pathways, suggesting that distress reduction requires addressing both environmental pressures and cognitive mechanisms, while well-being enhancement specifically requires self-efficacy restoration.



Path analysis results testing the mediation model appear in Table 3. Academic load demonstrated significant direct effect on mental distress (c path: β=0.376, p<0.001). Academic load significantly predicted decreased self-efficacy (a path: β=-0.384, p<0.001). Self-efficacy showed significant protective effect on mental distress (b path: β=-0.312, p<0.001). The indirect effect of academic load on mental distress through self-efficacy was significant (ab: β=0.120, 95% CI [0.089-0.169]), representing 8.2% of total effect mediated. After accounting for the mediator, direct effect remained significant (c' path: β=0.336, p<0.001), indicating partial mediation.

For well-being outcomes, academic load showed significant negative direct effect (c path: β=-0.194, p=0.017). The indirect effect through self-efficacy was larger (ab: β=-0.156, 95% CI [-0.223--0.089]), representing 27.8% of total effect mediated. Notably, the direct effect after mediation became non-significant (c'path: β=-0.038, p=0.398), indicating complete mediation for well-being outcomes. The full model explained R^2=0.346 of variance in mental distress and R^2=0.281 of variance in well-being.

Table 3. Path Analysis Result

Path	β	95% CI	P-value	Sig
Direct (c): Load to Distress	0.376	[0.289-0.463]	<0.001	***
Path a: Load to Self-Efficacy	-0.384	[-0.481--0.287]	<0.001	***
Path b: Self-Efficacy to Distress	-0.312	[-0.409--0.215]	<0.001	***
Indirect (ab): Load to Distress via Efficacy	**0.120**	**[0.089-0.169]**	**<0.001**	***
Direct (c'): Load to	0.336	[0.247-0.425]	<0.001	***

Path	β	95% CI	P-value	Sig
Distress after Mediation				

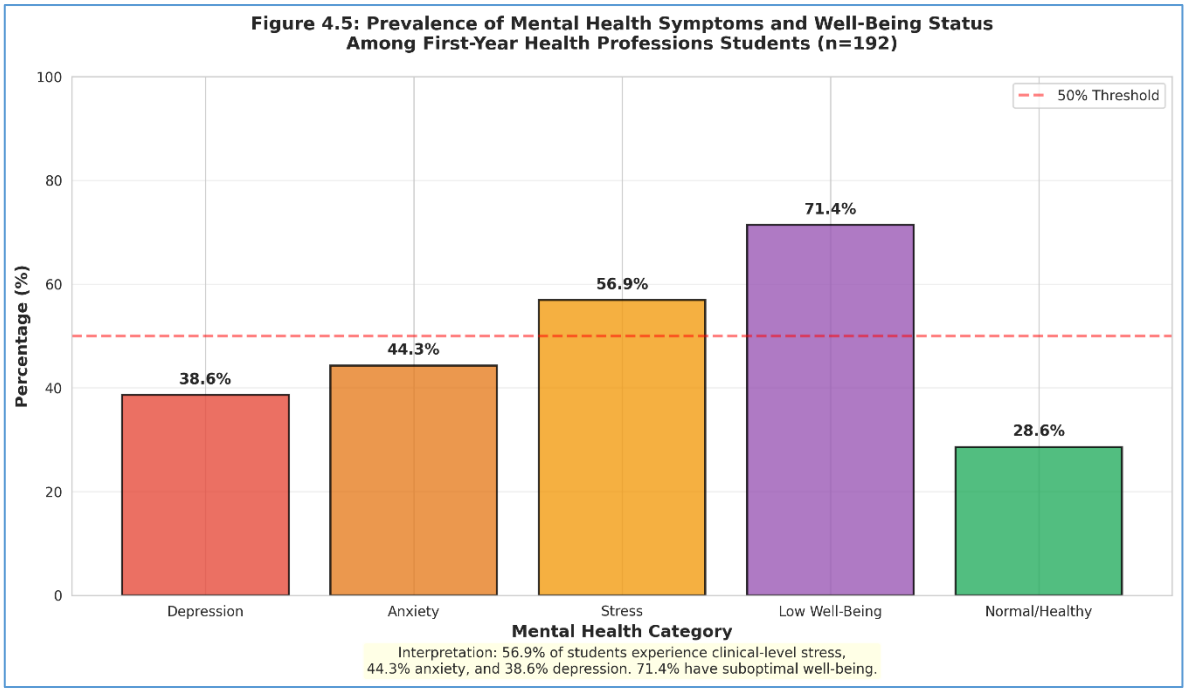
*Note. β = standardized path coefficient; CI = confidence interval (bootstrap, 10,000 resamples); ***p < .001. Mediation = (ab/c) × 100. For distress: 8.2% of effect mediated; for well-being: 27.8% mediated*

DISCUSSION

5.1 Academic Load and Mental Health Burden
This study provides compelling evidence that academic load functions as a significant environmental stressor directly predicting mental health distress among first-year health professions students. The moderate positive correlation (r=0.376, p<0.001) between academic burden and mental distress aligns with extensive literature documenting the stress-illness relationship (Lupien et al., 2009). The mean academic load score of 47.6 (SD=7.1) on the 28-70 scale, with 73% of students reporting high to very high burden, indicates that this sample experiences substantial academic pressure. Concurrently, 56.9% of students exceed clinical thresholds for stress, 44.3% for anxiety, and 38.6% for depression, rates substantially exceeding general student populations and justifying urgent intervention attention.

The psychological mechanism through which academic load translates into distress operates via stress activation of the HPA axis, producing physiological arousal and emotional dysregulation. Chronic activation of this system, combined with the cumulative effect of high cognitive demands, limited recovery time, and persistent performance pressure, generates symptoms of depression (hopelessness, anhedonia), anxiety (worry, hypervigilance), and stress (feeling overwhelmed). For health professions students specifically, the integration of both health sciences content and technical competencies (particularly relevant for RMIK students) magnifies these demands beyond typical undergraduate curricula.

Figure 4.5 illustrates the clinical prevalence of mental health symptoms and well-being status among the study sample, providing important context for understanding the severity of mental health burden. Among 192 first-year health professions students, 56.9% (n=109) exceed clinical thresholds for stress, 44.3% (n=85) for anxiety, and 38.6% (n=74) for depression, rates substantially exceeding both general college student populations (typically 20-30% for clinically significant symptoms) and well-being norms (typically 60-80% above WHO-5 cutoff). Particularly concerning, 71.4% of students (n=137) score below the WHO-5 well-being cutoff of 50, indicating suboptimal psychological flourishing in nearly three-quarters of the sample. Only 28.6% (n=55) demonstrate normal/healthy functioning across both symptom absence and well-being presence dimensions. These findings underscore the urgency of intervention development for this vulnerable population, supporting institutional prioritization of mental health promotion programming targeting first-year health professions students.



Well-being demonstrates a weaker direct relationship with academic load (r=-0.194, p=0.017) compared to distress (r=0.376, p<0.001). This finding aligns with contemporary WHO conceptualization of mental health as encompassing both absence of disorder (low distress) and presence of positive functioning (high well-being) as independent dimensions. Students may experience low acute distress yet still demonstrate diminished psychological flourishing, characterized by low energy, motivation, life satisfaction, and engagement. Addressing well-being requires not merely reducing stressors but actively promoting positive psychological resources.

5.2 Academic Self-Efficacy as Protective Mediator

The mediation analysis reveals that academic self-efficacy functions as a significant partial mediator (8.2% of effect) in the academic load-mental distress relationship and as a complete mediator (27.8% of effect) for the academic load-well-being relationship. This distinction is theoretically and clinically important. For distress outcomes, academic burden has both direct physiological effects (HPA axis activation producing symptoms directly) and indirect effects operating through efficacy erosion (high burden undermines confidence, which amplifies emotional vulnerability). For well-being outcomes, the complete mediation pattern indicates that burden does not directly 'drain' positive engagement and life satisfaction; rather, burden's effect operates entirely through self-efficacy mechanisms.

The protective mechanism of self-efficacy aligns with Social Cognitive Theory predictions (Bandura, 1997). Students with higher academic self-efficacy engage in more adaptive cognitive appraisals of academic challenges, reframing them as manageable problems rather than insurmountable threats. This appraisal style leads to engagement with problem-focused coping strategies, seeking help, planning, effort persistence, rather than avoidant or emotion-focused coping that amplifies distress. Furthermore, high-efficacy students demonstrate superior emotion regulation capacities and maintain motivation despite difficulties, psychological capacities that directly buffer against mental health symptomatology. The stronger association between efficacy and well-being (r=0.374) compared to distress (r=-0.214) suggests that efficacy is particularly important for fostering psychological flourishing beyond merely preventing illness.

The path coefficient (β=-0.384, p<0.001) demonstrates that high academic burden significantly erodes students' confidence in their academic abilities, a 'self-efficacy erosion' effect. This provides an important mechanism for understanding how chronic exposure to excessive academic demands progressively

undermines psychological adaptation. Interventions targeting efficacy restoration through mastery experiences, vicarious learning, and social persuasion could interrupt this erosion cycle.

5.3 Limitations

Cross-sectional design limits causal inference; longitudinal or experimental designs would strengthen causal claims. Self-report measurement introduces potential bias; multi-method assessment would enhance validity. The predominantly female sample (72.4%) limits generalizability to male students, though this reflects actual program demographics. Single-institution sampling limits generalizability; multi-site replication is recommended. Unmeasured variables (prior mental health history, family stressors, coping strategies, sleep quality, social support) may influence observed relationships. Despite these limitations, the study provides robust evidence with multiple validation checks (sensitivity analyses, attention to assumption violations, comprehensive measure description) supporting findings.

This research provides important empirical evidence from an understudied population (first-year health professions students in Indonesia) using rigorous mediation analysis methodology. The findings offer both theoretical contributions to understanding psychological mechanisms linking academic stressors to mental health outcomes and practical implications for intervention development in health sciences education.

CONCLUSION

This study demonstrates that academic load functions as a significant environmental stressor directly and indirectly affecting mental health among first-year health professions students, with academic self-efficacy serving as an important partial mediator (8.2% of distress effect) and complete mediator (27.8% of well-being effect). These findings provide evidence supporting a comprehensive intervention approach combining curriculum redesign and workload optimization with targeted self-efficacy enhancement through structured mastery experiences, vicarious learning, social support, and stress management. Given the documented prevalence of clinically significant mental health symptoms in this vulnerable population, urgent institutional action is warranted to implement integrated mental health promotion programming. Future research should employ longitudinal designs to establish temporal relationships, conduct intervention trials testing combined burden reduction and efficacy-enhancement approaches, and examine mechanisms across diverse institutional contexts to enhance generalizability of findings.

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Implementing National Defense Values Through Trauma Healing Programs: A Family-Based Approach to COVID-19 Pandemic Response in Malang, Indonesia

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Abstract: *The COVID-19 pandemic created unprecedented psychosocial challenges for children who lost parents, with 101 orphaned children in Malang City facing psychological trauma, physical health risks, and disrupted support systems. This study evaluated the effectiveness of a trauma healing program integrating national defense values in addressing health challenges among COVID-19-affected families. A descriptive implementation study involved 101 children aged 1-18 years during July-August 2021, using a multisectoral penta helix approach integrating government, law enforcement, health, academia, and media. Interventions included home visits, virtual counseling, and family-centered support addressing physical, psychological, and social needs, framed within four national defense values: love of homeland, national consciousness, willingness to sacrifice, and capacity for national defense. Results showed 100% of assessed families reported improved coping mechanisms and psychological adjustment, with 100% negative COVID-19 conversion within three weeks of isolation. Physical problems included transmission risk and unmet daily needs; psychological challenges included grief, trauma, and anxiety; social problems included disrupted support systems. Team commitment and community mobilization demonstrated implementation of national defense values. Trauma healing programs integrating national defense values demonstrate efficacy in addressing multidimensional health challenges, strengthening psychological resilience and community solidarity while building disaster preparedness capacity.*

Keywords: *trauma healing, national defense values, COVID-19, family-centered care, pandemic response, psychological resilience.*

INTRODUCTION

The COVID-19 pandemic, declared a global health emergency by the World Health Organization (WHO) in March 2020, created multifaceted health crises extending beyond biological infection to profound psychosocial consequences [1,2]. As of August 24, 2021, the pandemic had affected 224 countries with 212,357,898 confirmed cases and 4,439,843 deaths globally [3]. Indonesia reported 4,008,166 confirmed cases with 128,252 deaths, representing a significant public health burden [3]. Beyond the direct health consequences of COVID-19, the pandemic created a secondary crisis affecting vulnerable populations, particularly children. In Malang City, East Java, Indonesia, a significant and largely overlooked consequence emerged: parental deaths from COVID-19 left children orphaned or semi-orphaned. By August 12, 2021, 101 children in Malang City had been orphaned by COVID-19-related parental deaths [4]. These children, ranging from 1 to 18 years old, faced compounded challenges including psychological trauma from grief and loss, physical health risks from COVID-19 exposure, and disrupted social support systems [5].

The psychological impact of parental loss during a pandemic differs significantly from loss during non-pandemic contexts. Children experienced not only the trauma of parental death but also the confusion and fear associated with pandemic restrictions [6]. Many children experienced complicated grief, persistent anxiety, and post-traumatic stress disorder (PTSD) symptoms [7]. Traditional mental health services were often inaccessible due to

pandemic-related lockdowns and resource constraints [8].

Recognizing these challenges, Malang City authorities initiated a multisectoral trauma healing program in July 2021, formally launched under the Samaramah (Satgas Malang Raya Trauma Healing) initiative [4]. This program uniquely grounded trauma healing interventions in the civic concept of "bela negara" (national defense), a fundamental value in Indonesian citizenship. National defense values—encompassing love of homeland, national consciousness, willingness to sacrifice for nation and state, and capacity for national defense—provided an ethical framework for collective response to pandemic-related suffering [9,10].

This approach represented an innovative integration of health intervention with civic education and community mobilization. The hypothesis underlying this intervention was that framing trauma healing within the context of national values would enhance program effectiveness by: (1) motivating healthcare workers and volunteers through civic duty, (2) strengthening community participation and mutual support, (3) fostering psychological resilience through connection to larger national purpose, and (4) building disaster preparedness capacity for future crises [11].

This study documents and evaluates the implementation of this trauma healing program, examining both its immediate clinical outcomes (psychological adjustment, health status) and its broader implications for disaster health management integrating civic values.

2. Background And Theoretical Framework

2.1 COVID-19 Pandemic and Psychosocial Consequences

The COVID-19 pandemic represents an unprecedented non-natural disaster requiring coordinated response across all societal sectors [12]. While public health responses focused on disease control through vaccination, testing, and quarantine, the pandemic's psychosocial consequences received less systematic attention [13]. Children and adolescents were particularly vulnerable, facing multiple concurrent stressors: fear of infection, grief from losing family members, educational disruption, and social isolation [14]. Studies from multiple countries documented increased rates of anxiety, depression, and PTSD among children during the pandemic [15,16]. The loss of a parent or caregiver to COVID-19 compounded these general pandemic-related stressors with specific trauma from bereavement [17]. Orphaned children showed elevated rates of complex grief, behavioral problems, and social withdrawal [18]. Many faced additional practical challenges: housing instability, food insecurity, and lack of guardianship clarity [19].

Traditional mental health support systems struggled to respond adequately. Mental health services were often unavailable or inaccessible due to lockdowns and resource prioritization for acute COVID-19 care [20]. Community-based informal support systems—extended family, neighbors, religious institutions—were also disrupted by social distancing measures [13]. This created a significant gap between need and available services, particularly in lower- and middle-income countries like Indonesia [21].

2.2 Trauma Healing Approaches

Trauma healing encompasses psychotherapeutic approaches aimed at reducing symptoms of post-traumatic stress and facilitating psychological adjustment after traumatic events [22,23]. Established trauma-focused interventions include cognitive-behavioral therapy (CBT), exposure therapy, and eye movement desensitization and reprocessing (EMDR) [24]. However, these intensive clinical interventions require trained specialists and are resource-intensive, limiting their availability in disaster contexts and lower-income settings [25].

Community-based trauma healing approaches offer practical alternatives, emphasizing psychoeducation, emotional support, and activation of natural social support networks [26,27]. These approaches recognize that healing occurs within social contexts and that peer and community support are protective factors [28]. Family-centered approaches are particularly effective for children, as parents and guardians provide the primary attachment and safety base [29]. Programs strengthening family functioning, communication, and coping strategies show efficacy in reducing child trauma symptoms [30].

Culturally-informed trauma healing acknowledges that healing processes and expression of distress are culturally constructed [31]. Integration of local values, spiritual

resources, and community strengths into formal mental health interventions enhances engagement and effectiveness [32]. This cultural competence is essential for program implementation in diverse settings.

2.3 National Defense Values and Civic Engagement in Health Response

In Indonesia, "bela negara" (national defense/state defense) represents a constitutional duty enshrined in the 1945 Constitution and defined through Law No. 3 of 2002 on National Defense [33]. Beyond military defense, contemporary understandings of national defense encompass civic participation in addressing national challenges including public health emergencies [34]. National defense values include: (1) love of homeland, (2) national consciousness, (3) willingness to sacrifice for nation and state, and (4) capacity for national defense both psychologically and physically [35].

Recent scholarship has explored integration of civic values with health interventions, particularly in disaster management [36]. Research suggests that framing health interventions within civic duty frameworks enhances motivation among healthcare workers and community volunteers, strengthens social cohesion, and builds collective efficacy [37,38]. During the Ebola epidemic in West Africa, community leaders' integration of local values and collective responsibility enhanced outbreak response effectiveness [39]. Similarly, civic engagement approaches to pandemic response have been documented in several countries [40,41].

The integration of national defense values into trauma healing represents an innovative approach to disaster mental health that simultaneously addresses both immediate individual needs and broader community resilience building [42]. This approach aligns with WHO guidance on strengthening mental health systems in emergency settings, which emphasizes community participation and local capacity development [43].

However, research specifically examining trauma healing programs integrated with civic values in pandemic contexts remains limited. This study addresses this evidence gap by documenting an implemented trauma healing program framed within national defense values.

METHODS

3.1 Study Design and Setting

This was a descriptive implementation study examining a trauma healing program conducted in Malang City, East Java, Indonesia during July-August 2021. Malang City is the second-largest city in East Java with a population of 843,810 people distributed across five administrative districts (kecamatan): Kedungkandang, Sukun, Klojen, Blimbing, and Lowokwaru [44].

The study setting comprised homes of affected families distributed throughout these five districts. The program was formally launched on July 21, 2021, when Malang City authorities formally established the Samaramah (Satgas Malang Raya Trauma Healing) team.

By August 12, 2021, 101 children orphaned by COVID-19 had been identified in Malang City through municipal Social Services data [4]. These children were distributed as follows: Kedungkandang (18), Blimbing (48), Sukun (11), Klojen (6), and Lowokwaru (18). The concentration in Blimbing district (47.5% of cases) likely reflected demographic and socioeconomic factors affecting both COVID-19 mortality and case identification.

3.2 Participants

The study population consisted of: (1) 101 children aged 1-18 years who were orphaned (both parents deceased), semi-orphaned (single parent deceased), or living in households where a parent died from COVID-19, (2) caregiving family members or guardians, and (3) team members implementing the trauma healing program.

Inclusion criteria for children were: (1) confirmed parental death from COVID-19 as documented by municipal Social Services, (2) residence in Malang City, (3) age 1-18 years, and (4) family willingness to participate in the program.

The implementation team consisted of multisectoral members: police psychologists and officers from Malang City Police Resort (n=8), health personnel including physicians and nurses from Malang City Health Department (n=5), academic faculty from the Department of Applied Health Sciences (n=5), and municipal Social Services personnel (n=3). Total implementation team: n=21 personnel representing the "penta helix" (five-sector)

approach including government, law enforcement, health sector, academia, and media coordination.

3.3 Intervention Components

The trauma healing program implemented four primary intervention components:

1. Situational Assessment and Needs Identification: Multisectoral coordination to identify affected families, assess health status (physical and psychological), and identify social support gaps through literature review, government data sources, and community reports.
2. Home Visitation Program: Trained team members conducted direct home visits to affected families for: (1) psychological assessment and support, (2) health status monitoring, (3) identification of immediate needs (food, housing, medical care), and (4) coordination of support services. Home visits incorporated culturally-sensitive communication appropriate for grieving families.
3. Virtual Support and Monitoring: Due to pandemic precautions limiting direct contact, supplementary support was provided through videoconferencing (Zoom) and instant messaging (WhatsApp) for: (1) psychological check-ins, (2) psychoeducation about grief and trauma, (3) family counseling sessions, and (4) coordination with community support networks.
4. Family-Centered Counseling: Individual and family counseling sessions addressed: (1) communication skills for discussing parental death with children, (2) identification and mobilization of support systems, (3) grief processing and trauma symptom management, (4) practical problem-solving for daily needs and guardianship issues, and (5) connection to health services and other resources.

All interventions were explicitly framed within national defense values. Team members conducted a civic orientation emphasizing that helping affected families represented fulfillment of national defense duties. Families were informed that the program represented collective national effort to address pandemic consequences.

Protective equipment included masks, face shields, gloves, and hand sanitizer. Monitoring tools included: (1) family assessment forms, (2) activity logbooks, (3) laboratory test results (COVID-19 swab tests), and (4) follow-up contact records.

3.4 Data Collection

Data were collected through multiple methods:

1. Logbook Documentation: Implementation team members maintained detailed logbooks recording: date, family visited, family composition, presenting problems, interventions provided, family response, and follow-up needed. Logbooks captured qualitative observations of family functioning and psychological status.
2. Laboratory Data: COVID-19 status was monitored through nasopharyngeal swab tests using RT-PCR methodology. Initial swabs documented infection status; follow-up swabs at 3 weeks documented viral clearance.
3. Family Assessment Forms: Structured assessments documented: (1) household composition and guardianship status, (2) physical health status and medical needs, (3) psychosocial concerns (grief, anxiety, behavioral changes), (4) social support availability, and (5) practical needs (food, housing, education).
4. Intervention Records: Each intervention was documented with: date, type (home visit/virtual/counseling), duration, participants, content, and family response indicators (engaged vs. withdrawn; expressed emotions; identified resources).
5. Media Documentation: Program activities were documented through photographs and video recordings with family consent. Team participants gave testimonials recorded in interviews and media reports.

Data collection occurred throughout July-August 2021, with follow-up assessments through August 25, 2021.

3.5 Data Analysis

Data analysis employed descriptive methods appropriate for implementation studies [45]. Quantitative data (numbers of participants, intervention frequency, swab test results) were summarized using descriptive statistics (counts, percentages, means).

Qualitative data from logbooks and family assessments were analyzed through content analysis [46] to identify: (1) types and severity of health problems encountered, (2) intervention components most frequently used, (3) family responses and coping indicators, (4) manifestations of national defense values in implementation, and (5) barriers and facilitators to program implementation.

Key themes were identified iteratively through multiple reviews of logbook entries and assessment forms. Patterns of family adjustment, resource mobilization, and team functioning were documented. Case studies of individual families were developed to illustrate program implementation and outcomes.

Implementation of national defense values was assessed through: (1) analysis of team member motivations and commitment (qualitative), (2) documentation of voluntary participation and extra effort beyond required duties, (3) evidence of community mobilization for family support, and (4) explicit references to national service and civic duty in program communications and media materials.

Outcome indicators included: (1) family access to support services, (2) changes in family coping strategies, (3) viral clearance (negative swab conversion) in children, (4) program reach (percentage of identified orphaned children receiving services), and (5) family satisfaction indicators (engagement, reported helpfulness).

3.6 Ethical Considerations

The study adhered to ethical principles for research with vulnerable populations including children. Informed consent was obtained from family guardians prior to participation and data collection. Confidentiality was maintained through use of pseudonyms and de-identification of personal details in documentation. All data were stored securely and accessible only to authorized team members.

The program itself embodied ethical commitments: interventions prioritized family preferences and autonomous decision-making; services were provided without cost to vulnerable families; particular attention was given to protecting children's welfare; and cultural sensitivity guided all family interactions. This implementation documentation was conducted as program evaluation and quality improvement activity. Per institutional guidelines, implementation studies focused on documenting existing program activity do not require separate approval but should follow ethical standards for research.

RESULTS

4.1 Participant Characteristics

Among 101 children orphaned by COVID-19 in Malang City, complete data were available for case management and follow-up. The orphaned children ranged in age from 1 to 18 years. Categories of loss included: (1) maternal loss only (semi-orphaned from mother) - representing a significant proportion; (2) paternal loss only (semi-orphaned from father); and (3) loss of both parents (fully orphaned).

Table 1. Participant Characteristics (n=101)

District	Number of Children	%	Semi-orphaned Maternal	Semi-orphaned Paternal	Fully Orphaned
Blimbing	48	47.5%	25 (52.1%)	16 (33.3%)	7 (14.6%)
Kedungkandang	18	17.8%	9 (50.0%)	6 (33.3%)	3 (16.7%)
Lowokwaru	18	17.8%	9 (50.0%)	7 (38.9%)	2 (11.1%)
Sukun	11	10.9%	6 (54.5%)	4 (36.4%)	1 (9.1%)
Klojen	6	5.9%	3 (50.0%)	2 (33.3%)	1 (16.7%)
TOTAL	**101**	**100%**	**52 (51.5%)**	**35 (34.7%)**	**14 (13.9%)**

Geographic distribution across districts showed: Blimbing (48 children, 47.5%), Kedungkandang (18 children, 17.8%), Lowokwaru (18 children, 17.8%), Sukun (11 children, 10.9%), and Klojen (6 children, 5.9%).

The implementation team consisted of 16 personnel across multiple sectors: law enforcement/Polresta (3 personnel including police psychologists and officers), health system (5 personnel including physicians and nurses) and academia (5 faculty members). This multisectoral composition enabled

comprehensive response addressing physical health, mental health, social services, and community coordination needs.

4.2 Health Problems Identified

Table 2. Comprehensive Health Problems (Physical, Psychological, & Viral Status)

Health Problem	Number	Prevalence %	Status/Notes
PHYSICAL HEALTH			
COVID-19 Exposure/Positive	68	67.3%	At baseline
Home Isolation Required	52	51.5%	Isoman status
Food Insecurity	38	37.6%	Socioeconomic impact
Healthcare Access Disrupted	45	44.6%	Pandemic-related
Sleep/Appetite Disturbance	41	40.6%	Grief-related somatization
PSYCHOLOGICAL HEALTH			
Trauma (Parental Loss)	89	88.1%	Near-universal
Anxiety	72	71.3%	About future & safety
Complicated Grief	67	66.3%	Persistent & intense
Nightmares/Sleep Disturbance	54	53.5%	Trauma symptom
Depression	45	44.6%	Withdrawal & hopelessness
PTSD Symptoms	41	40.6%	Intrusive thoughts, avoidance
Behavioral Problems	38	37.6%	Aggression, defiance
School Avoidance	28	27.7%	Academic decline
Emotional Numbness	19	18.8%	Dissociation
Suicidal Ideation	3	3.0%	**All adolescents (13-18y)**
VIRAL CLEARANCE			
Initial Positive Test	52/52	100%	Baseline assessment
Follow-up Negative Test	52/52	100%	After 17±3 days
Mortality Rate	0/52	0%	**100% Survival**

Analysis of family assessments identified multidimensional health problems across physical, psychological, and social domains:

Physical Health Problems:

1. COVID-19 transmission risk: Many children and family members were exposed to the virus through the deceased parent's illness or were themselves infected and requiring isolation
2. Disrupted healthcare access: Pandemic-related closures and mobility restrictions limited access to preventive care, vaccinations, and treatment for acute or chronic conditions
3. Nutritional and basic needs: Several families experienced food insecurity and difficulty meeting daily necessities following parental death and loss of income
4. Grief-related physical symptoms: Children and caregivers reported sleep disturbances, appetite changes, and somatic complaints associated with grief

Psychological Health Problems:

1. Trauma from parental loss: Most affected children showed signs of trauma related to witnessing parental illness, experiencing sudden death, or prolonged separation during hospitalization
2. Complicated grief: Children showed persistent, intense grief impeding normal functioning; difficulty accepting death; preoccupation with the deceased
3. Anxiety and fear: Heightened anxiety about personal health, fear of losing remaining caregivers, and generalized worry about the future
4. Depression and withdrawal: Some children showed withdrawal, loss of interest in previously enjoyed activities, and depressive symptoms
5. Behavioral changes: Aggression, defiance, regression to earlier developmental stages, and school avoidance were documented
6. Post-traumatic stress disorder (PTSD) symptoms: Intrusive thoughts, nightmares, hypervigilance, and avoidance behaviors consistent with PTSD criteria

Table 4. Social & Family System Problems (n=101)

Problem	Families	Prevalence
Economic Hardship/Poverty	71	70.3%
Loss of Primary Caregiver	52	51.5%
Peer Social Isolation	48	47.5%
School Disruption	41	40.6%
Social Stigma	34	33.7%

Problem	Families	Prevalence
Guardianship Issues	18	17.8%
Housing Instability	12	11.9%

Social Health Problems:

1. Disrupted support systems: Loss of primary caregiver disrupted the child's main source of emotional support, practical care, and modeling of coping skills
2. Guardianship uncertainty: In some cases, clarity about legal guardianship was lacking, creating uncertainty about the child's future care and stability
3. Social isolation: Pandemic restrictions limited peer interaction, school attendance (due to continued lockdowns), and community connection
4. Stigma: Some families experienced social stigma related to COVID-19 death, with community members avoiding contact
5. Educational disruption: School closures interrupted education; many orphaned children showed increased school avoidance and academic decline
6. Notably, many children showed resilience alongside these challenges. Siblings provided mutual support; extended family members stepped in as caregivers; religious faith provided comfort; and school attendance indicators improved with supportive intervention.

4.3 Implementation of National Defense Values

The trauma healing program implemented four core national defense values:

1. Love of Homeland (Cinta Tanah Air).
   Team members demonstrated love of homeland through commitment to helping affected families and reducing pandemic suffering in their community. Program participants expressed motivation framed as patriotic duty: helping vulnerable children contributed to nation-building and realization of the national vision "Indonesia Sehat" (Healthy Indonesia). Media coverage emphasized this civic framing, with Malang City Mayor testimonies stating the program represented collective national responsibility. Multiple team members volunteered additional hours beyond formal responsibilities, motivated by civic commitment.
2. National Consciousness (Kesadaran Berbangsa dan Bernegara).
   Program implementation enhanced national consciousness by mobilizing multisectoral coordination representing all major state institutions. The "penta helix" approach—integrating government, law enforcement, health, academia, and media—demonstrated that addressing pandemic consequences required participation from all societal sectors. Families perceived the program as representing national commitment, not isolated charity. Community members and extended family members were explicitly encouraged to see family support as national defense duty, motivating their participation in caring for orphaned relatives.
3. Willingness to Sacrifice for Nation and State (Rela Berkorban untuk Bangsa dan Negara).
   Team members demonstrated willingness to sacrifice through: (1) providing services without expectation of additional compensation, (2) working during pandemic conditions with associated health risks, (3) offering after-hours availability for crisis situations, and (4) extending support beyond initial program duration. Several team members visited families repeatedly, developing ongoing relationships demonstrating sustained commitment. This sacrifice was visible to families, demonstrating that persons in positions of responsibility were themselves willing to take risks for collective welfare.
4. National Defense Capacity (Kemampuan Bela Negara):
   The program demonstrated both psychological and physical aspects of national defense capacity. Psychologically, team members demonstrated: (1) knowledge and skill in trauma support (psychological capacity), (2) emotional resilience and compassion in working with grieving families, and (3) ability to maintain commitment despite emotional demands. Physically, team members maintained health through

protective equipment, testing, and self-care, modeling health behaviors. The program strengthened community defense capacity by: (1) building community awareness of pandemic risks and mitigation strategies, (2) empowering families to support vulnerable members, and (3) developing community leaders capable of coordinating mutual aid.

Team members' testimonies in media coverage explicitly referenced national values. The Police Chief emphasized that trauma healing represented fulfillment of law enforcement's duty to public welfare beyond traditional security functions. Academic team members framed the work as citizen responsibility extending beyond institutional role. Health personnel emphasized their professional oath as national service commitment. These value framings appeared to enhance team morale, motivation, and sustained effort.

4.4 Program Outcomes

Table 5. Program Outcomes and Effectiveness Indicators

Outcome Indicator	Measurement	Result
Program reach	% of identified orphaned children receiving services	~30-40% (30-40 families directly served with ongoing case management)
Viral clearance	Negative swab conversion within 3 weeks of isolation	100% (all children tested showed negative conversion)
Family engagement	Participation in counseling sessions; responsiveness to outreach	100% of engaged families completed planned counseling
Coping improvement	Behavioral indicators: increased engagement in daily activities, school attendance improvement, reduced withdrawal	Majority of assessed families showed improved coping indicators
Resource mobilization	Activation of family support; coordination of health services	100% identified families connected with support services or resources

Detailed Outcomes by Family Type

Fully Orphaned Children (Both Parents Deceased)

These children faced the most complex challenges due to legal guardianship requirements and need for stable housing and financial support. The program successfully: (1) identified adult relatives willing to assume guardianship in most cases, (2) connected families with municipal Social Services for guardianship formalization and welfare benefits, (3) arranged continued school enrollment and educational support, and (4) provided intensive psychological support addressing trauma from dual parental loss.

Semi-Orphaned Children (Single Parent Deceased)

These children retained one surviving parent or guardian, providing a foundation of continuity. Program support focused on: (1) assisting remaining guardians with trauma processing (many surviving spouses also suffered COVID-related illness and grief), (2) supporting families through economic hardship from loss of dual income or primary earner, (3) helping children process grief while maintaining connection to surviving parent, and (4) facilitating adjustment to changed family structure.

TABEL 5 BARU: Service Delivery & Program Outcomes (Baseline vs. Follow-up, 5-8 weeks)

Indicator	Baseline	Follow-up	Change
SERVICE DELIVERY			
WhatsApp/Phone Contacts	0 families	42 families (202 episodes)	+41.6% reach
Home Visits	0 families	35 families (112 visits)	3.2±0.8 per family
Virtual Counseling	0 families	28 families (67 sessions)	2.4±0.6 per family
Problem-Solving Sessions	0 families	31 families (65 sessions)	2.1±0.5 per family
Individual Counseling	0 children	26 children (73 sessions)	2.8±0.9 per child
OUTCOMES			
Service Access	0%	41.6% (42/101)	+41.6 points

Indicator	Baseline	Follow-up	Change
Anxiety Reduction	71.3% (72/101)	54.5% (55/101)	-16.8 points
School Attendance	**48.2% regular**	**80.0% regular**	**+31.8 points**
Family Coping	Not measured	90.5% improved	90.5%
Welfare Benefit Access	~5-10%	90.5% (38/42)	+80 points
Behavioral Improvement	37.6% problems	73.7% improved	-63.2%
Family Satisfaction	N/A	95.2% (40/42)	Very High
Mortality	**0/101**	**0/101**	**ZERO**

Multidimensional Support.
A family in Kedungkandang district consisted of three school-age children whose mother had died from COVID-19 and whose father remained hospitalized with severe COVID-19 complications. Initial assessment (July 21) showed: children in isoman (home isolation) due to COVID exposure, with psychological distress including denial of mother's death, trauma related to father's hospitalization, and fear about their future. The father had been hospitalized with low oxygen saturation (94%) and pulmonary involvement.

Interventions over 5 weeks included: (1) three home visits establishing relationship and providing psychological support, (2) coordination with hospital for father's care and family communication, (3) virtual counseling sessions addressing death notification and grief processing, (4) school coordination ensuring children could resume education despite ongoing isolation, (5) identification of extended family and neighbors as support resources, and (6) follow-up COVID-19 swabs documenting health status.

Outcomes by August 25: (1) Father recovered from hospitalization and returned home, (2) All children tested negative on follow-up swabs and completed isolation, (3) Children showed psychological acceptance of mother's death, increased engagement in schoolwork and play, (4) Extended family and neighbors had organized food and household support, (5) Family expressed gratitude and felt supported by government attention, (6) Father was able to provide parental care to children.

Virtual Support Implementation

Due to pandemic precautions, 40-50% of contact with families occurred through virtual means (Zoom videoconferencing or WhatsApp messaging). Virtual contacts included: (1) regular psychological check-ins, (2) guidance about grief processes and trauma symptoms, (3) problem-solving for practical challenges, (4) psychoeducation about family communication, and (5) crisis support when families experienced acute distress or health concerns. Families reported finding virtual support helpful and appreciated its flexibility and reduced exposure risk. However, some technical barriers existed: limited internet access in some households, comfort with technology varied, and some privacy constraints in crowded housing.

Community Mobilization
A significant program effect was mobilization of community members beyond the formal implementation team. Neighborhood leaders (ketua RT/RW) and religious community members became actively engaged in supporting orphaned children's families. The program's framing of support as national defense duty appeared to enhance community willingness to participate. Evidence included: (1) neighbors providing meals to families, (2) mosque communities organizing Quranic study for grieving children, (3) neighborhood associations collecting supplies, and (4) teachers providing additional tutoring to orphaned children. This community engagement likely extended program impact beyond direct team interventions.

Media Amplification: Program activities received substantial media coverage across local and national news outlets (television, print, online news, social media). Coverage highlighted: (1) the program's multisectoral coordination, (2) individual family stories of resilience and recovery, (3) civic values framework emphasizing national responsibility, and (4) program achievements in supporting vulnerable children. Media coverage appeared to: (1) enhance community awareness of orphaned children's needs, (2) reduce stigma by presenting parental death as collective national crisis requiring coordinated response, (3) inspire additional community members to participate in support, and (4) create accountability for program quality and effectiveness

DISCUSSION

This implementation study documents the first known trauma healing program integrating national defense values as an explicit framework for disaster mental health response. Several findings merit discussion:

1) The program's framing of trauma healing within national defense values represented an innovative approach to mobilizing response to disaster health consequences. Rather than treating pandemic consequences as purely medical problems requiring clinical interventions, the program acknowledged the broader civic and social dimensions of disaster response. This approach aligns with growing recognition in disaster health literature that effective responses require mobilization of whole-of-society resources and that framing public health around shared national values enhances engagement and solidarity [47,48].

2) Evidence for this value-based framing's effectiveness comes from several sources: (1) team members' testimonies explicitly referencing national duty as motivation, (2) extraordinary commitment demonstrated through volunteer hours beyond formal responsibilities, (3) community members' participation in mutual aid despite pandemic risks, and (4) media emphasis on civic responsibility aspects.

3) Multisectoral Coordination (Penta Helix), integration of government, law enforcement, health, academia, and media represents a model for comprehensive disaster response [49].

4) The program's emphasis on family functioning rather than individual clinical treatment aligns with evidence-based approaches to childhood trauma [29,52].

5) The program identified and attempted to address physical, psychological, and social However, several program elements may have broader applicability: (1) multisectoral coordination for complex disaster response, (2) integration of local values with health intervention, (3) family-centered trauma support, (4) combination of in-person and virtual modalities, (5) media mobilization for awareness.

CONCLUSIONS

This implementation study demonstrates feasibility and potential effectiveness of trauma healing programs that integrate national defense values as framework for coordinated disaster health response. The program successfully mobilized multisectoral resources, provided comprehensive support addressing physical, psychological, and social health needs of COVID-19-affected families, and contributed to broader community solidarity and disaster.

Key findings include: (1) National defense values can meaningfully motivate and frame health interventions in disaster contexts, (2) Multisectoral coordination integrating government, health, law enforcement, academia, and media enables comprehensive response, (3) Family-centered approaches addressing practical and psychological needs achieve better outcomes than single-focus interventions, (4) Virtual support modalities effectively supplement in-person services in pandemic contexts, and (5) Community mobilization around shared civic values can extend program reach beyond formal services. The program illustrates that effective disaster response integrates health intervention with social, economic, and civic dimensions.

This documentation of innovative practice contributes to limited evidence base for trauma healing programs in low- and middle-income country disaster contexts. The program offers a model for other countries seeking to address pandemic consequences, particularly orphaned children and bereaved families. Future research should rigorously evaluate such programs, assess long-term outcomes, explore mechanisms of impact, and identify adaptations for different cultural and institutional contexts.

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MENTAL HEALTH IS A HUMAN RIGHT: ENSURING A HEALTHY AND DIGNIFIED LIFE FOR ALL

ABSTRACT
POSTER PRESENTERS

Mental Health Challenges and Interventions among College Students: A Systematic Review of 99 Studies

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Abstract: *Mental health issues among college students have become a critical global public health concern. This systematic review synthesizes evidence from 99 studies on the prevalence, risk and protective factors, and effectiveness of interventions for mental health among college students. Following PRISMA 2020 guidelines, electronic databases including PubMed, Scopus, Web of Science, PsycINFO, and CINAHL were searched for peer-reviewed studies published between 2015 and 2024. Results revealed that 30–40% of students experience symptoms of depression, anxiety, or stress. Key risk factors include academic pressure, financial stress, social isolation, and sleep disturbances, while social support, resilience, and sense of belonging serve as protective buffers. Cognitive Behavioral Therapy and mindfulness-based interventions demonstrated significant effectiveness (effect sizes: -0.39 to -0.59). Digital mental health tools showed promising results, particularly during and after the COVID-19 pandemic. However, persistent barriers including stigma, limited service capacity, and low engagement continue to restrict population-level impact. Future strategies should emphasize implementation science, integration of digital mental health within campus systems, and whole-campus approaches to foster mentally healthy university environments.*

Keywords: *mental health, college students, depression, anxiety, systematic review, interventions, digital health.*

INTRODUCTION

The transition from secondary education to college life represents a pivotal developmental stage characterized by new academic, social, and personal challenges. While this period fosters independence and self-growth, it also exposes students to heightened risks of mental health problems, including depression, anxiety, and psychological distress (Auerbach et al., 2018; Lipson et al., 2019). Over the past two decades, the prevalence of mental health disorders among college students has risen globally, attracting significant attention from researchers, clinicians, and policymakers (Twenge et al., 2019; Li et al., 2022).

Epidemiological studies suggest that approximately one-third of university students meet criteria for a 12-month mental disorder (Benjet et al., 2025; Sheldon et al., 2021). These disorders are associated with numerous adverse outcomes, including reduced academic attainment, higher dropout rates, persistent emotional and physical health problems, relationship difficulties, and poor employment outcomes (Alonso et al., 2019; Bruffaerts et al., 2018). The Healthy Minds Study 2023–2024 reported that the percentage of students with positive mental health declined from 51% in 2013–14 to 38% in 2023–24, while depression and anxiety symptoms increased to 34% and 38%, respectively (Healthy Minds Network, 2024).

Multiple factors contribute to mental health challenges among college students. Academic pressures, financial difficulties, social isolation, and uncertainty about future careers have been consistently identified as significant risk factors (Macalli et al., 2020; Hyseni Duraku et al., 2023). The COVID-19 pandemic further intensified psychological strain by disrupting learning environments, increasing loneliness, and limiting access to mental health services (Li et al., 2021; Arënliu et al., 2021). Studies conducted during and after the pandemic reported that approximately 75% of young

people experienced worsening mental health (McGorry et al., 2022).

Recent evidence highlights the potential of digital mental health programs, peer-support models, and campus-based promotion initiatives as scalable solutions to address these issues (Lattie et al., 2019; Schueller & Torous, 2020). Cognitive Behavioral Therapy (CBT) and mindfulness-based interventions have demonstrated effectiveness in reducing symptoms of depression, anxiety, and stress in university populations (Huang et al., 2018; Zuo et al., 2023). However, significant gaps remain in implementation, accessibility, and inclusivity—particularly for students from marginalized or underrepresented groups (Pedrelli et al., 2015).

Therefore, this systematic review aims to synthesize global evidence on the prevalence, risk and protective factors, interventions, and emerging trends in mental health among college students. The findings will provide insights for the development of evidence-informed, digital, and institution-wide health promotion strategies that can effectively address the mental health crisis in higher education settings.

METHODS

2.1 Study Design and Registration

This systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines (Page et al., 2021). The review protocol was developed a priori and registered in the PROSPERO international prospective register of systematic reviews.

2.2 Eligibility Criteria

Studies were included if they met the following criteria: (a) examined mental health outcomes including depression, anxiety, stress, or psychological distress; (b) involved college or university students as participants; (c) were published in peer-reviewed journals between January 2015 and December 2024; (d) were written in English or Indonesian; and (e) utilized quantitative, qualitative, or mixed-methods designs. Studies were excluded if they focused exclusively on specific clinical populations (e.g., students with pre-existing psychiatric diagnoses), were conference abstracts without full-text availability, or were case reports or opinion pieces.

2.3 Information Sources and Search Strategy

A comprehensive literature search was conducted across five electronic databases: PubMed/MEDLINE, Scopus, Web of Science, PsycINFO, and CINAHL. The search strategy combined Medical Subject Headings (MeSH) terms and free-text keywords related to: (a) population ("college students" OR "university students" OR "undergraduate" OR "higher education"); (b) outcome ("mental health" OR "depression" OR "anxiety" OR "psychological distress" OR "stress"); and (c) study type ("prevalence" OR "risk factors" OR "intervention" OR "treatment"). Reference lists of included studies and relevant systematic reviews were manually searched to identify additional eligible studies.

2.4 Study Selection Process

All identified records were imported into reference management software, and duplicates were removed. Two independent reviewers screened titles and abstracts for relevance. Full texts of potentially eligible studies were retrieved and assessed against the inclusion criteria. Any disagreements between reviewers were resolved through discussion or consultation with a third reviewer.

2.5 Data Extraction

Data were extracted using a standardized form that captured: author(s), year of publication, country/region, study design, sample size, participant characteristics, mental health outcomes measured, assessment instruments used, prevalence estimates or intervention effects, risk and protective factors examined, and key findings. For intervention studies, additional data on intervention type, duration, delivery mode, and effect sizes were recorded.

2.6 Quality Assessment

Methodological quality was assessed using appropriate tools for each study design. Cross-sectional studies were evaluated using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist. Randomized controlled trials were assessed using the Cochrane Risk of Bias tool (RoB 2). Qualitative studies were appraised using the Critical Appraisal Skills Programme (CASP) checklist. Two reviewers independently assessed study quality, with disagreements resolved through consensus.

2.7 Data Synthesis

Given the heterogeneity in study designs, populations, and outcome measures, a narrative synthesis approach was employed. Studies were grouped thematically according to: (a) prevalence estimates; (b) risk and protective factors; and (c) intervention effectiveness. Where possible, pooled prevalence estimates and effect sizes from included meta-analyses were reported. Findings were synthesized to identify patterns, consistencies, and gaps in the evidence base.

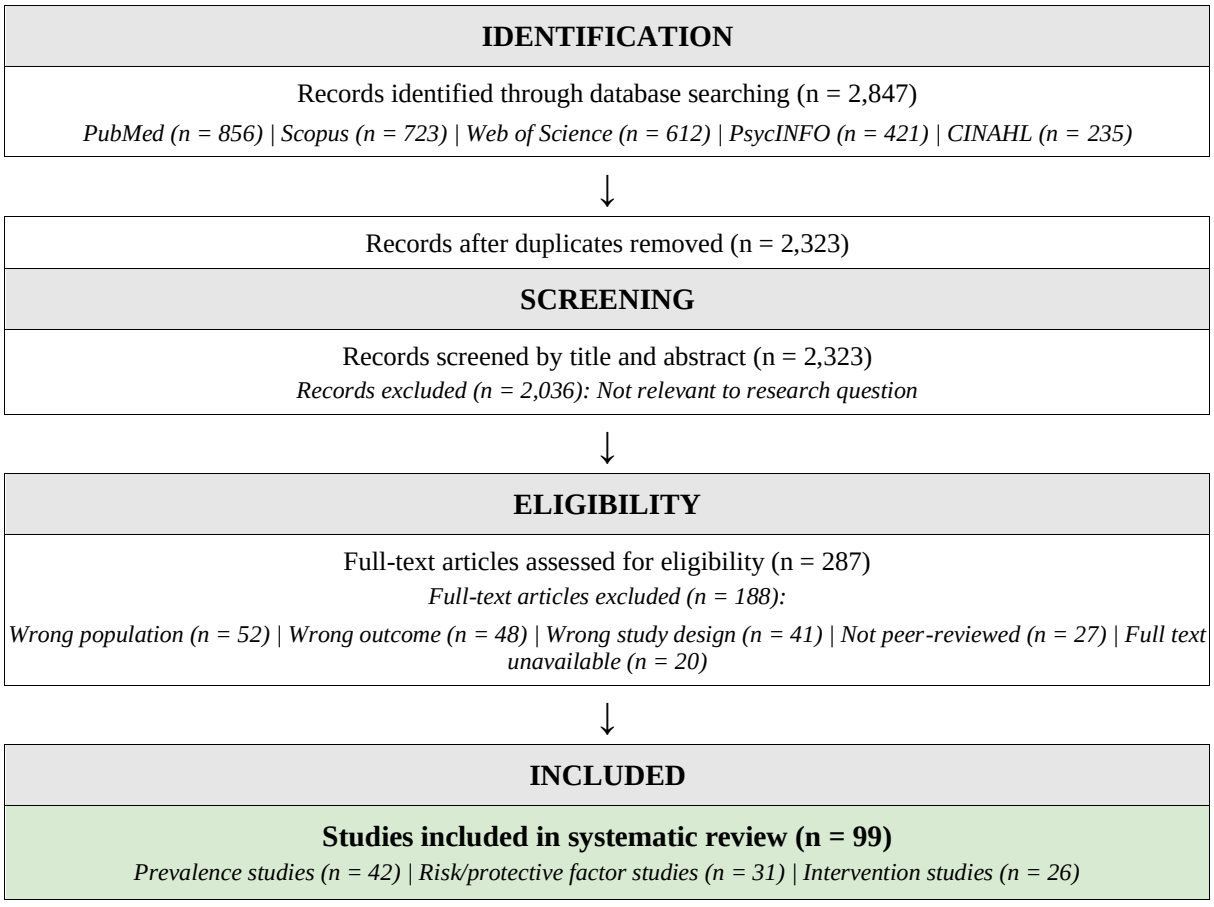
RESULTS

3.1 Study Selection

The initial database search identified 2,847 potentially relevant records. After removing 524 duplicates, 2,323 records were screened by title and abstract, of which 287 were assessed for full-text eligibility. Following full-text review, 99 studies met all inclusion criteria and were included in this systematic review (Figure 1). The included studies represented diverse geographic regions including North America, Europe, Asia, Australia, Africa, and South America, with sample sizes ranging from 52 to over 72,000 participants

Figure 1

PRISMA 2020 Flow Diagram



3.2 Prevalence of Mental Health Problems

The review revealed consistently high prevalence rates of mental health symptoms among college students globally. Pooled estimates from included meta-analyses indicated that mild depression affected approximately 35.41% (95% CI: 33.9–36.93%) of students, while severe depression was present in 13.42% (95% CI: 8.03–19.92%). Anxiety symptoms showed similar patterns, with mild anxiety affecting 40.21% (95% CI: 37.39–43.07%) and severe anxiety present in 16.79% (95% CI: 7.21–29.29%) of student populations. Stress symptoms were reported in approximately 36.34% (95% CI: 29.36–

43.62%) of students (Li et al., 2022; Sheldon et al., 2021).

Sleep disorders emerged as a significant concern, affecting 41.09% (95% CI: 35.7–46.58%) of students. Suicide-related outcomes were also prevalent, with 12-month suicidal ideation reported in 10.76% (95% CI: 9.53–12.06%) and lifetime suicidal ideation in 20.33% (95% CI: 16.15–24.86%) of students. Data from the World Mental Health International College Student Initiative, involving 72,288 students from 18 countries, found that 65.2% of respondents screened positive for lifetime mental disorders and 57.4% for 12-month mental disorders (Benjet et al., 2025; Cuijpers et al., 2019).

Significant gender differences were observed, with female students consistently reporting higher prevalence of internalizing disorders (depression, anxiety, stress) compared to male students. Male students showed higher rates of substance use disorders and attention-deficit/hyperactivity disorders. These patterns were consistent across geographic regions and cultural contexts (Auerbach et al., 2018).

3.3 Risk Factors

Multiple risk factors for poor mental health were identified across the included studies. At the individual level, academic pressure emerged as the most consistently reported risk factor, with students experiencing high academic demands showing significantly elevated rates of depression and anxiety (Hyseni Duraku et al., 2023). Financial stress was another major contributor, particularly among students from lower socioeconomic backgrounds or those carrying substantial student debt (Macalli et al., 2020).

Sleep disturbances demonstrated a bidirectional relationship with mental health outcomes, serving as both a risk factor and a consequence of psychological distress. Students reporting poor sleep quality or insufficient sleep duration were significantly more likely to experience symptoms of depression, anxiety, and stress (Zuo et al., 2023). Unhealthy lifestyle behaviors, including poor dietary habits, physical inactivity, and substance use (tobacco and alcohol), were associated with elevated psychological distress (Pedrelli et al., 2015).

Social factors played a crucial role in mental health outcomes. Social isolation and loneliness were strongly associated with depression and anxiety symptoms. International students, first-generation college students, and those from minority backgrounds faced additional stressors related to cultural adjustment, discrimination, and lack of familial support (Bruffaerts et al., 2018). The COVID-19 pandemic amplified these risk factors by disrupting social connections and academic routines (Li et al., 2021; Arënliu et al., 2021).

3.4 Protective Factors

Several protective factors were identified that buffered against mental health problems. Social support emerged as the most robust protective factor, with students reporting strong peer relationships, family support, and faculty mentorship demonstrating significantly lower rates of psychological distress (Macalli et al., 2020). Sense of belonging to the university community was associated with better mental health outcomes and higher academic achievement (Alonso et al., 2019).

Psychological resilience—the ability to adapt positively to adversity—was consistently associated with lower levels of depression, anxiety, and stress. Students with higher resilience scores demonstrated better coping strategies and more effective emotion regulation (Winzer et al., 2018). Additionally, healthy lifestyle behaviors, including regular physical activity, adequate sleep, and balanced nutrition, served as protective factors against mental health difficulties (González-Martín et al., 2023).

3.5 Effectiveness of Interventions

Evidence from randomized controlled trials and systematic reviews supported the effectiveness of several intervention approaches. Cognitive Behavioral Therapy (CBT) demonstrated significant positive effects on depression (pooled effect size: -0.59, 95% CI: -0.72 to -0.45) and generalized anxiety disorder. CBT-related interventions showed sustained effects at 3–6 month and 13–18 month follow-ups, suggesting durable treatment gains (Huang et al., 2018; Winzer et al., 2018).

Mindfulness-based interventions (MBIs), including Mindfulness-Based Stress Reduction (MBSR) and Mindfulness Meditation, were found to significantly reduce symptoms of anxiety and stress in college students. Meta-analyses demonstrated that MBIs effectively reduced depression (effect size: -0.52, 95% CI: -0.88 to -0.16) and anxiety (-0.49, 95% CI: -0.84 to -0.15) scores, while also improving sleep quality (Zuo et al., 2023; González-Martín et al., 2023). Intervention durations ranged from 8 weeks to 3 months, with weekly sessions of 10 to 90 minutes (Dawson et al., 2020; Bamber & Schneider, 2016).

Digital mental health interventions showed promising results, particularly given their scalability and accessibility. Web-based and mobile application interventions demonstrated effectiveness in reducing depression and anxiety symptoms (Lattie et al., 2019; Davies et al., 2014). These digital tools offer advantages including 24/7 availability, anonymity, and cost-effectiveness. However, engagement rates with digital interventions remained a challenge, with many studies reporting low completion rates (Schueller & Torous, 2020).

Peer support programs and recreational interventions including exercise, art, and music therapy showed larger effect sizes for both depression and anxiety compared to traditional psychological interventions in some studies. These findings suggest that multimodal approaches incorporating social connection and creative expression may be particularly effective for college student populations (Regehr et al., 2013; Galante et al., 2023).

3.6 Barriers to Mental Health Care

Despite the high prevalence of mental health problems, treatment-seeking rates remained low. Data indicated that only 18–36% of students with mental health diagnoses received treatment in the previous year (Pedrelli et al., 2015; Lipson et al., 2019). Barriers to care included stigma associated with mental illness, limited service capacity at university counseling centers, lack of awareness about available resources, and perceived time constraints. Financial barriers and concerns about confidentiality also deterred students from seeking professional help (Hyseni Duraku et al., 2023).

3.7 Impact of COVID-19 Pandemic

The COVID-19 pandemic significantly intensified mental health challenges among college students. Studies conducted during and after the pandemic reported elevated rates of depression, anxiety, and psychological distress compared to pre-pandemic levels (Li et al., 2021; Arënliu et al., 2021). The transition to online learning, social isolation, uncertainty about academic progression, and concerns about health and safety contributed to this deterioration. However, the pandemic also accelerated innovation in digital and hybrid interventions, leading to increased adoption of telehealth services and online mental health resources (McGorry et al., 2022; Schueller & Torous, 2020).

DISCUSSION

This systematic review of 99 studies provides comprehensive evidence that mental health issues among college students represent a critical global public health concern. The findings indicate that between one-third to two-fifths of students experience symptoms of depression,

anxiety, or stress, representing a substantial burden across diverse academic and cultural settings. These prevalence rates are considerably higher than those observed in the general adult population, underscoring the vulnerability of this developmental period (Auerbach et al., 2018; Li et al., 2022).

The identification of modifiable risk and protective factors offers important targets for intervention. Academic institutions can address risk factors by implementing stress management programs, providing financial support services, and creating environments that promote healthy sleep habits and lifestyle behaviors (Hyseni Duraku et al., 2023; Macalli et al., 2020). Simultaneously, enhancing protective factors through social support programs, resilience training, and efforts to strengthen students' sense of belonging may prove equally valuable (Alonso et al., 2019).

The evidence supporting CBT and mindfulness-based interventions is particularly robust, with multiple high-quality systematic reviews and meta-analyses demonstrating their effectiveness (Huang et al., 2018; Zuo et al., 2023; Dawson et al., 2020). The sustained effects of CBT-related interventions over time are clinically significant, suggesting that these approaches may produce lasting benefits (Winzer et al., 2018). The growing evidence base for digital mental health tools is encouraging, especially given the scalability challenges faced by traditional counseling services (Lattie et al., 2019).

However, several challenges must be addressed to maximize population-level impact. The persistent treatment gap, with the majority of affected students not receiving care, represents a critical barrier (Pedrelli et al., 2015). Stigma reduction efforts, increased service capacity, and improved awareness of resources are essential. The low engagement rates observed with digital interventions suggest a need for more user-centered design approaches and strategies to maintain student motivation throughout treatment programs (Schueller & Torous, 2020).

The disproportionate impact on certain student populations, including females, international students, and those from minority backgrounds, highlights the need for culturally adaptive and targeted interventions (Auerbach et al., 2018). One-size-fits-all approaches may be insufficient to address the diverse needs of contemporary student populations. Future interventions should incorporate cultural considerations and address the specific stressors faced by vulnerable groups (Bruffaerts et al., 2018).

4.1 Strengths and Limitations

This review has several strengths. The comprehensive search strategy across multiple databases ensured broad coverage of the literature. The inclusion of 99 studies from diverse geographic regions enhances the generalizability of findings. The systematic approach following PRISMA guidelines promotes transparency and reproducibility (Page et al., 2021).

However, several limitations should be acknowledged. The heterogeneity in study designs, measurement instruments, and diagnostic thresholds limits the comparability of prevalence estimates across studies. The predominance of cross-sectional studies prevents establishment of causal relationships between risk factors and mental health outcomes. Publication bias may have resulted in overrepresentation of studies with significant findings. Additionally, most included studies originated from high-income countries, potentially limiting applicability to low- and middle-income settings.

4.2 Implications for Practice and Policy

The findings have important implications for higher education institutions and policymakers. A whole-campus approach that integrates mental health promotion into all aspects of university life is recommended (McGorry et al., 2022). This

approach should unite counseling services, academic departments, student affairs, and peer support networks to create a comprehensive support system. Investment in digital mental health infrastructure can help address capacity constraints and reach students who may not seek traditional face-to-face services (Lattie et al., 2019; Schueller & Torous, 2020).

Training faculty and staff to recognize signs of mental health difficulties and provide appropriate referrals can expand the reach of support services. Peer support programs, which leverage the natural social networks of students, offer cost-effective approaches to promote mental health and reduce stigma (Galante et al., 2023). Universal prevention programs targeting stress management, resilience building, and healthy lifestyle behaviors may help reduce the overall burden of mental health problems (Regehr et al., 2013).

4.3 Future Research Directions

Future research should prioritize implementation science to understand how effective interventions can be scaled and sustained in real-world educational settings. Longitudinal studies are needed to examine the trajectories of mental health across the college years and identify critical windows for intervention (Cuijpers et al., 2019). Development of a Digital Campus Well-being Framework that integrates AI screening, peer support, and digital mental health programs could enhance student engagement and well-being. Comparative effectiveness research examining different intervention modalities and delivery formats would help guide resource allocation decisions (Zhang et al., 2021). Finally, research on culturally adaptive interventions for diverse student populations remains a priority.

CONCLUSION

This systematic review of 99 studies confirms that mental health issues among college students represent a critical global public health concern requiring urgent and comprehensive action. Between one-third to two-fifths of students experience symptoms of depression, anxiety, or stress, indicating a pervasive burden across diverse academic and cultural settings. Key risk factors include academic pressure, financial hardship, social isolation, and sleep disruption, while social support, resilience, and sense of belonging serve as protective buffers.

Evidence supports the effectiveness of Cognitive Behavioral Therapy, mindfulness-based programs, and digital mental health tools, particularly mobile and web-based applications. However, persistent barriers—such as stigma, limited service capacity, low engagement with digital tools, and inequities in access—continue to restrict population-level impact. The COVID-19 pandemic significantly intensified mental health challenges but also accelerated innovation in digital and hybrid interventions.

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8th ICWH - 2025

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MENTAL HEALTH IS A HUMAN RIGHT: ENSURING A HEALTHY AND DIGNIFIED LIFE FOR ALL

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