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The Impact of Integrating Behavioral Neuroscience into School Mental Health Literacy: A Literature Review

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Abstract - This literature review explores integrating behavioral neuroscience into school mental health literacy (MHL) by framing emotional challenges as concrete biological processes. Research shows that this perspective improves understanding of brain function, reduces stigma around psychological conditions, diminishes punitive disciplinary practices, and equips students and educators with biological frameworks for self-regulation and stress management. Overall, incorporating mental health literacy programs into school curricula represents a sustainable approach to reducing stigma, promoting inclusive attitudes, and equipping students and educators with the knowledge and social skills required for improved mental well-being.

Keywords: ***Behavioral Neuroscience, School, Mental Health, Literacy, Wellbeing.***

INTRODUCTION

Education is widely recognized as a key proximal factor in mitigating the adverse effects of personal, social, and global traumas that contribute to mental health problems. Social-emotional learning programs in schools function as essential community-level interventions to increase awareness of mental, neurological, and psychiatric illnesses, particularly in low- and middle-income countries. School-based intervention programs have improved mental health knowledge and, to a lesser extent, help-seeking behaviors; however, these knowledge gains have not consistently led to attitudinal changes. (Ma et al., 2023, pp. 408-424) In Brazil, teachers have been effectively trained to identify and refer students exhibiting social, mental, and behavioral problems. (Vieira et al., 2014) In Liberia, a social contact-based approach, in which individuals share personal experiences of mental illness and recovery, has been implemented by organizations supporting people living with mental illness. This method is most effective with adult audiences. In contrast, educational approaches have proven more effective with youth audiences, who, like Liberian teachers, have had limited exposure to the biopsychosocial model of mental illness and the supporting neuroscience. (Hook et al., 2020) These findings further inform the selection of intervention strategies.

Teachers represent a vital community resource for supporting youth development and resilience. Children exposed to war, violence, or other trauma may exhibit behaviors that differ from typical classroom expectations (NCTSN Core Curriculum on Childhood). Enhancing teachers' knowledge and well-being can indirectly strengthen children's resilience and mental health by improving teachers' capacity to build positive relationships with students. Teacher support is a community-level factor that can be readily strengthened and contributes to systems that foster children's resilience. International reviews of mental health literacy programs for teachers report widespread increases in mental health knowledge and reductions in stigma. For example, a mental health literacy training program in Malawi and Tanzania significantly improved teachers' knowledge and attitudes toward mental health. (Kutcher et al., 2014) These trainings typically focus on identifying mental health signs and symptoms, with some also addressing child development. However, because these programs are brief, often lasting only a few hours to a day, participants frequently request additional training, and there is limited evidence of changes in teachers' helping behaviors. (Ramakrishnan et al., 2026).

A joint report by UNICEF and the World Health Organization estimates that approximately 20% of children and adolescents globally experience mental health problems, with moderate to severe conditions accounting for 10%. This high prevalence and the tendency for these issues to become chronic present significant public health challenges. (Sappenfield et al., 2024) Middle school students are in a critical period of physical, psychological, and academic development, during which mental health status is a key determinant of developmental outcomes. (al., 2023). Unaddressed mental health issues at this stage can lead to academic and social difficulties, elevate the risk of psychological disorders such as anxiety and depression, and contribute to the persistence of these problems into

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adulthood. (McLeod et al., 2012, pp. 482-497) Mental health literacy (MHL) is defined as "knowledge and beliefs about mental disorders which aid their recognition, management or prevention." MHL encompasses multidimensional capabilities for coping with mental illnesses and for maintaining and promoting mental health. Enhancing MHL is regarded as an essential strategy for improving overall mental health. (Lee et al., 2026) The concept of MHL includes four main components: knowledge of risk factors and determinants of mental disorders; recognition of symptoms of common mental illnesses; attitudes toward mental illness or individuals with mental disorders; and mental health self-help behaviors, including help-seeking and helping behaviors. (Wei et al., 2015).

Mental health literacy (MHL) is defined as "knowledge and beliefs about mental disorders which aid their recognition, management or prevention" (Jorm et al., 1997). MHL involves recognizing symptoms of mental health challenges, understanding causes and risk factors, and knowing how to access treatment. It also includes knowledge of mental health promotion and prevention strategies. MHL plays a significant role in mental health outcomes (Jorm et al., 1997). Mental health stigma is linked to poor psychological well-being, reduced self-esteem and self-efficacy, and challenges in employment and housing. Stigma also contributes to increased symptoms, negative perceptions of physical health, ineffective coping, lower treatment adherence, poorer attitudes toward treatment, and less willingness to seek help.

In contrast, accurate mental health knowledge and positive attitudes toward treatment are associated with greater help-seeking, better access to care, and improved well-being. (Bora et al., 2026) Because it influences access to treatment and outcomes, MHL is a key focus of school-based prevention, early intervention, and treatment, especially within multi-tiered systems that integrate educational and mental health services. MHL also contributes to the underuse of mental health services in marginalized communities and may help address ongoing treatment disparities affecting Black, Indigenous, and other people of color.

Although mental and physical health have often been viewed as separate, they are closely connected. Individuals with physical illnesses such as chronic pain or diabetes are at higher risk for depression, especially when symptoms are not well managed. (Barriers to Accessing Health Care for People with Chronic Conditions: A Qualitative Study, 2021) The mind–body connection is also seen when mental health disorders are primary. Adults with mood, anxiety, substance use, or impulse control disorders are more likely to develop chronic physical conditions, including arthritis, heart disease, stroke, hypertension, diabetes, asthma, chronic lung disease, and ulcers. (Bahji, 2024) Adolescents with mood or disruptive behavior disorders have higher rates of infectious diseases, respiratory problems, and weight-related issues. (Ramirez et al., n.d.) People with depression are more prone to dietary problems and physical ailments than those without depression, mainly due to related symptoms. (The association between dietary quality, sleep duration, and depression symptoms in the general population: findings from cross-sectional NHANES study, 2024) Schizophrenia is associated with chronic physical conditions and reduced life expectancy. (Hjorthøj et al., 2017, pp. 295-301) When mental and physical health conditions occur together, symptoms worsen, and treatment becomes more complex, especially if addressed separately. Recognizing and integrating the mind–body connection is essential for improving mental health and well-being in both the general population and among children and youth in schools.

Globally, one in seven individuals aged 10 to 19 years experiences a mental health condition. (Mental health of adolescents, 2025) Mood and behavioral disorders are primary contributors to disability within this age group, and suicide remains a leading cause of death. (Garnett et al., 2022) These data highlight the urgent need for preventive strategies that address mental health issues and actively promote mental wellbeing among young people. Improving mental health literacy (MHL) is a central strategy in this context. MHL includes knowledge related to achieving and maintaining positive mental health, understanding mental disorders and their treatments, recognizing, managing, and preventing mental health problems, reducing mental health stigma, and seeking help when necessary. More recently, MHL has been defined as knowledge about mental health problems that supports actions benefiting mental health, emphasizing the link between understanding and behaviors that promote wellbeing.

A growing body of evidence indicates that higher levels of MHL are associated with improved mental health outcomes. (Yamaguchi et al., 2020, pp. 58-66) Conversely, limited MHL is linked to increased stigma and delayed help-seeking, which can intensify distress and hinder early intervention. (Velasco et al., 2020) Young people typically exhibit lower levels of MHL compared to adults, increasing their vulnerability to mental health challenges. (Mansfield et al., 2020) Therefore, promoting MHL is essential for preventive mental health, especially among young people who encounter systemic inequities or contextual barriers that limit access to information and support. Enhancing MHL equips young people with the knowledge and skills to understand, manage, and seek early support for their mental health.

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LITERATURE REVIEW

Behavioral neuroscience examines the nervous system's role in human and animal behavior. (Behavioral Neuroscience, n.d.) Utilizing a biological framework, this field investigates the functions of the brain's physical structures and other components of the nervous system in normal and abnormal behavior, as well as the evolution and development of these functions over time. (Thompson, 2001)

Behavioral neuroscience is one of several disciplines situated at the intersection of biology and psychology. (Kirby et al., 2024) It is primarily experimental and research-oriented, while clinical neuropsychology is an applied discipline that focuses on assessing and treating individuals with brain injuries or neurological disorders. (Reddy et al., 2024) In contrast, neuropsychology typically investigates human subjects and emphasizes the relationship between psychological processes and clinical brain dysfunction. (Brown et al., 2023) Related fields include evolutionary psychology, affective neuroscience, social neuroscience, behavioral genetics, and neurobiology. (Thompson, 2001)

Integrating behavioral neuroscience into school mental health literacy (MHL) fundamentally changes how educators address student well-being. This approach reframes behavioral challenges from a biological perspective, reduces reliance on punitive disciplinary measures, and promotes supportive relationships. Educating students and staff about how environmental stressors affect brain function can reduce stigma, strengthen teacher-student relationships, and support the development of targeted coping strategies. (Shay & Pohan, 2021)

Behavioral and Educational Outcomes

- **De-stigmatization:** Presenting mental health within a biological framework enables teachers to recognize that emotional and social challenges have a biopsychosocial basis rather than reflecting personal deficiencies. (Cooper, 2005, pp. 3-13)
- **Shift in Discipline:** Educators trained in behavioral neuroscience concepts are less likely to use verbal or corporal punishment, opting instead for positive reinforcement and social-emotional support. (Samudre et al., 2022)
- **Improved Recognition:** Staff become more proficient at identifying early risk factors, including chronic stress, trauma, and sleep deficits, which may impair learning and attention. (Lupien et al., 2009).

Classroom Implementation

- *Trauma-Informed Routines:* Schools establish predictable daily routines to support students who have experienced early life adversity or exhibit nervous system dysregulation. (Davis & Glynn, 2024, pp. 508-534)
- *Enhanced Self-Efficacy:* Teachers develop greater confidence in managing classroom mental health needs and referring students to appropriate professional support. (Chui et al., 2023)

Integrating behavioral neuroscience grounds these concepts in biological processes. Neuroscience reconceptualizes emotional and behavioral issues as neurobiological responses to chronic stress, trauma, or developmental changes, rather than as character flaws or intentional misbehavior. Brain Maturation Context: Adolescence involves significant structural brain changes, including reduced cortical volume from synaptic pruning and the gradual maturation of executive function circuits. (Vijayakumar et al., 2016, pp. 2027-2038) Neuroscience-based MHL enables schools to align expectations with students' neurological development.

Enhancing Teacher Self-Efficacy and Support Intentions

Educators frequently report inadequate preparation for managing psychological crises within classroom environments. Literature reviews suggest that neuroscience-informed mental health literacy (MHL) training provides effective cognitive strategies. (Suwanwong et al., 2024)

- *Increased Confidence:* Teachers exhibit enhanced self-efficacy in identifying at-risk students and managing daily behavioral challenges. (Campbell et al., 2017, pp. 1-8)
- *Sustained Action:* Compared to standard programs, neuroscience-based MHL interventions are linked to persistent intentions to seek personal support and to connect students with institutional resources. (Wei et al., 2024)

Advancing Student Help-Seeking and Coping Mechanisms

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Adolescents benefit substantially from understanding how their brains develop. School-wide implementation of innovative neuroscience-based MHL curricula, such as the Decode Pilot Evaluation, leads to measurable improvements in student outcomes. (Habgood et al., 2025)

Cognitive Reframing: Students learn that the adolescent brain undergoes typical tissue refinement, which heightens vulnerability to stress, excessive screen time, and substance exposure. (The Impact of School-Based Interventions on Adolescents' Digital Use and Mental Wellbeing: A Systematic Review and Arm-Based Random-Effects Meta-Analysis, 2026)

Empowered Coping: Linking stress-reduction practices, including sleep hygiene and physical activity, to brain optimization motivates students to adopt healthier routines.

Proactive Literacy: Comprehensive classroom sessions consistently enhance general mental health knowledge and foster early help-seeking behaviors among students. (Wei et al., 2024).

Learning in early childhood is driven primarily by biological processes rather than by external information or instruction. (The Interaction of Biology and Environment - Transforming the Workforce for Children Birth Through Age 8, 2015) Brain development follows a predictable sequence in which lower survival systems activate before higher-order thinking systems. (Stiles & Jernigan, 2010) During early childhood, learning progresses through a specific sequence: safety, connection, emotion, attention, cognition, and memory. (Posner et al., 2014) Following this order supports natural, effective learning, while disruptions to the sequence can hinder it. (Alex, 2023).

Safety: The Foundational Element of Learning

Safety is the essential prerequisite for learning. The brain constantly assesses the environment for potential threats. (Lupien et al., 2009) When a child perceives physical or emotional danger, the stress response system activates, and stress hormones such as cortisol prepare the body for survival rather than learning. (Lupien et al., 2009) In this state, higher brain regions responsible for reasoning and memory become less active. (Alex, 2024) For instance, a child experiencing fear, shame, or anxiety in the classroom may appear distracted or uncooperative because the brain prioritizes protection over information processing. A calm, predictable, and supportive environment signals safety to the brain. (Davis & Glynn, 2024) Consistent routines, gentle communication, and emotional reassurance create the neurological conditions necessary for learning to begin.

Connection: The Role of Relationships in Brain Regulation

Connection is critical for young children, who regulate their emotions and behavior through relationships with trusted adults. (Understanding Early Relational Health, 2023) Warm and responsive interactions stabilize the nervous system and reduce stress responses. (Serve and Return, n.d.) When children feel seen, heard, and valued, their brains shift from survival mode to relational engagement. For example, a teacher who communicates at eye level, listens attentively, and responds empathetically enhances a child's sense of belonging. This relational safety activates brain systems associated with trust and openness. (Zhang et al., 2025) Without connection, children may withdraw, resist, or struggle to engage. In contrast, strong connections foster receptivity to guidance and exploration.

Emotion: The Primary Driver of Engagement

Emotion plays a significant role in determining what the brain attends to and retains. (Tyng et al., 2017) The limbic system, which processes emotions, is especially active in young children. (Qin et al., 2012, pp. 7941-7946) Positive emotions such as curiosity, joy, and excitement promote learning, whereas fear and shame inhibit it. (Supporting Early Scientific Thinking Through Curiosity, 2019) For example, a storytelling session that incorporates expression and humor captures emotional interest and enhances memory retention. Conversely, harsh criticism or embarrassment can reduce participation and impair retention. Emotion acts as a filter, leading the brain to prioritize emotionally significant experiences. (Safitri et al., 2026, pp. 1-15)

Attention: Focus as a Consequence of Emotion

Attention emerges once safety, connection, and positive emotion are established. (Posner et al., 2014) Young children have limited attention spans, and their focus is strongly influenced by interest and engagement. (Akshoomoff, 2002, pp. 625-642) Meaningful and interactive activities naturally promote sustained attention.

Hands-on science experiments, movement-based mathematics activities, and collaborative art projects capture attention more effectively than passive instruction. Attention is not simply a skill to be demanded; it develops as a response when the brain feels secure and emotionally engaged. (Rueda, 2024)

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Cognition: Processes of Thinking and Understanding

Cognition includes processes such as reasoning, analysis, and problem-solving, which the developing prefrontal cortex governs. (Eslinger et al., 2021) When foundational needs such as safety, connection, emotion, and attention are met, cognitive processing becomes more effective. (Howard & Lewis, 2024) For instance, a calm and engaged child can follow instructions, compare ideas, and solve problems. In contrast, a child who feels stressed or disconnected may find cognitive tasks overwhelming. Optimal thinking is possible only when the brain's foundational systems are stable. (Takesian & Hensch, 2013, pp. 3-34).

Memory: The Process of Consolidating Learning

Memory constitutes the final stage of the learning process. (Guskjolen & Cembrowski, 2023) Information moves from short-term awareness to long-term storage through repetition, emotional relevance, and meaningful practice. (Deuker et al., 2013, pp. 19373-19383) Positive emotional experiences further enhance memory consolidation. (Qasim et al., 2024)

A child who repeatedly sings a song with joy is more likely to remember the lyrics. Similarly, practicing a skill in varied and engaging ways strengthens neural pathways. Memory forms not only through exposure; it develops through emotionally meaningful, repeated experiences. (Williams et al., 2022)

Learning in the young brain follows a biological sequence: safety, connection, emotion, attention, cognition, and ultimately memory. (Brain Architecture, n.d.) Each stage builds upon the previous one. (Early Brain Growth and Development, n.d.) When educators and caregivers recognize and support this sequence, they can create environments that foster natural brain development. (Early Brain Development, 2022) Prioritizing emotional safety and strong relationships allows the brain to focus, think, and remember effectively. (Medicine et al., 2025) Therefore, authentic learning begins with security and connection rather than instruction. (Rushton et al., 2010, pp. 351-361).

Research on mental health literacy (MHL) demonstrates that students with higher literacy levels are better able to perceive emotional changes, accurately identify and attribute academic setbacks, and adopt proactive coping strategies. (Correlates of adolescents' profiles of cognitive emotion regulation strategies in the school context, 2026) These students effectively mobilize both internal and external resources, which supports self-efficacy and decreases the likelihood of learned helplessness. (Factors influencing mental health literacy and its relationship with learning weariness in middle school students: a person-centered latent profile analysis, 2026) This process is consistent with psychological resilience development models highlighted in recent literature. (Fu et al., 2025) For instance, studies have shown that high school students with elevated MHL are more likely to seek social support and professional psychological assistance when facing stressful events. (Ratnayake & Hyde, 2019) Such proactive coping behaviors are essential for sustaining self-efficacy under pressure and for preventing declines in learning motivation. (Parto & Besharat, 2011, pp. 639-643) A lack of learning motivation is prevalent among middle school students (Antunes et al., 2022), and emotion regulation ability, as a core component of MHL, plays a significant role in their psychological functioning. (Chervonsky & Hunt, 2019, pp. 270-282) Students with higher MHL utilize stress management and emotion regulation strategies to mitigate the negative effects of setbacks, thereby preserving motivation and reducing the risk of learning weariness. (Wei et al., 2024) Conversely, students with lower MHL levels report higher levels of learning weariness, a pattern likely resulting from deficits in emotion regulation abilities, which are theorized to function as a protective mechanism within the MHL framework. (Zhu et al., 2026).

DISCUSSION AND CONCLUSION

Research on mental health literacy (MHL) has grown substantially during the 2020s, with increased interest among young people reflecting greater recognition of its importance in promoting youth mental health. Most empirical studies (89%) on MHL in young people have focused exclusively on school settings. (Coughlan et al., 2024) Nevertheless, a growing body of research now examines MHL in non-school-exclusive environments, suggesting new opportunities to expand MHL initiatives to a wider range of young people. (Toledo et al., 2025).

This review documents advances in expanding mental health literacy (MHL) research beyond school environments into settings where young people reside, socialize, and seek assistance. Engagement occurred through community organizations, sporting clubs, health and mental health services, digital platforms, and public venues, reflecting a growing commitment to reach youth outside formal education systems. Implementing MHL research in these contexts enhances accessibility and relevance, with the potential to reach young people who are disengaged from school and may be more vulnerable, including those in rural communities and inpatient psychiatric facilities.

Digital and creative interventions demonstrated considerable potential, especially when co-designed with young people. Nevertheless, concerns about privacy and digital distractions underscore the need for ethical, deliberate implementation. In

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comparison, school-based MHL interventions have improved mental health knowledge but have shown limited impact on stigma reduction and help-seeking behaviors, indicating that digital and creative approaches may provide more comprehensive benefits. (Ma et al., 2023) Although assessing intervention effectiveness was outside the scope of this scoping review, the synthesis illustrates the range of non-school-exclusive contexts in which MHL initiatives have been implemented. (Yeo et al., 2024) This observation highlights the need for future research to examine how context influences engagement, implementation, and outcomes.

Collaboration among professionals in education, mental health, and neuroscience is essential to ensure that neuroscientific content is accurately synthesized, translated, and communicated to appropriate audiences. (Pollack et al., 2024) Representatives from each discipline should jointly identify relevant neuroscience topics for stakeholders, including educators, school mental health personnel, students, and families. (Framework of Core Competencies for Interdisciplinary School Mental Health Collaboration, 2024, pp. 345-357) Content must be adapted to the audience's baseline knowledge and developmental stage, with explicit alignment to the intended objectives. (Goswami, 2008, pp. 381-399) Cross-disciplinary partnerships further facilitate the development of engaging activities and innovative delivery methods that are both practical and suitable for educational settings. (Amiel & Tan, 2019).

Future practice should extend the tiered intervention framework by assessing students' family environments and psychosocial resources and tailoring strategies to their mental health literacy (MHL) profiles. Integrating routine MHL assessment into early-stage school psychological screening can facilitate timely identification of students with diverse needs. (Mental Health Literacy Scale (MHLS), n.d.) For students classified as high cognition and low attitude, interventions should prioritize destigmatization-focused education and employ experiential methods such as contact-based learning to bridge the gap between knowledge and attitude. For those identified as low literacy and developmental, implement comprehensive, sequential mental health education courses, supplemented by individual counseling, to strengthen foundational MHL. (Mental Health Education, 2024) Effective implementation of this support system requires collaboration among school administrators, mental health educators, homeroom teachers, and parents. (Bohnenkamp et al., 2023, pp. 130-150) Policy guidance and resource allocation are necessary to establish sustainable conditions for tiered interventions. (Selecting Evidence-Based Practices for Tiers 1, 2, and 3: Navigating Clearinghouses and Databases, 2025) This evidence-informed and precision-targeted approach offers a more tailored and promising pathway to reduce learning weariness and enhance psychological well-being among secondary school students. (Wei et al., 2024).

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