Brain Doctors: Evaluating a Mental Health Initiative for Elementary Students

Parnika Telagi, MD; Jessica Liu, BS; Bryan Johnston, MD

ABSTRACT

Background: Brain Doctors is a community-engaged mental health education program developed using the Food Doctors model to enhance third-grade students' understanding of self and community wellness. This study serves as an evaluation of the pilot program.

Methods: Two dynamic, interactive 1-hour sessions were created, with pre-session and post-session assessments used to measure student growth. The sessions were presented at 2 elementary schools in Milwaukee, Wisconsin by medical students. Feedback was gathered through participant satisfaction surveys following each session.

Results: Student feedback indicated that most participants had a positive experience with the program. Pre-assessment (n = 116) and post-assessment (n = 125) results revealed areas of improvement and areas where performance declined.

Discussion: The elementary students' positive response demonstrated their enthusiasm for the program. This study affirmed our perception that elementary and medical students can engage meaningfully in emotional wellness education.

BACKGROUND

Children in low socioeconomic environments often face violence, trauma, and limited access to mental health resources, increasing their risk for mental health disorders and high-risk behaviors.[1,2] Protective factors, such as positive relationships and school involvement, promote well-being and help reduce risky behaviors.[3] Multi-tiered school mental health systems enhance academic and psychosocial outcomes, but their absence in many schools led to the creation of "Brain Doctors," a community-based mental health pilot initiative.[4]

Brain Doctors originates from "Food Doctors," an established nutrition education program for third-grade students at 2 urban, underserved elementary schools in Milwaukee, Wisconsin. The design, informed by a literature review of the most effective school-based nutrition education programs, emphasizes 2 key pillars: (1) interactivity and hands-on engagement, and (2) cultural relevance. Led by medical students, the curriculum has successfully strengthened student knowledge and attitudes about nutrition.[5,6] Since its inception in 2013, Food Doctors has been implemented at St. Marcus Lutheran School and Milwaukee Academy of Science, fostering strong community partnerships that allow for open dialogue. In a feedback meeting, one of the school's principals reported limited capacity to address mental health and well-being within their existing curriculum; thus Brain Doctors was developed as a pilot initiative to address this gap.

While researching similar programs, we (the authors) explored Second Step Elementary, a teacher-led curriculum fostering social-emotional learning in elementary students through 4 weekly units on growth mindset, emotional management, empathy and kindness, and problem-solving. Its effectiveness is well-documented; a 2-year randomized controlled trial showed significant improvements in social-emotional skills and reduced disruptive behaviors among participants,[7] while another study linked higher engagement to better academic performance and fewer negative classroom behaviors.[8]

Inspired by Second Step Elementary and the success of Food Doctors, we collaborated with community partners—school principals and teachers at St. Marcus Lutheran School and Milwaukee Academy of Science—to create Brain Doctors. Drawing on literature reviews, existing programming, and partner input, Brain

• • •

Author Affiliations: Medical College of Wisconsin, Milwaukee, Wisconsin (Telagi, Liu, Johnston).

Corresponding Author: Parnika Telagi, MD, email parnikatelagi@gmail.com; ORCID ID 0009-0003-5778-9129

Doctors was developed into two 1-hour sessions designed to fit both the school schedule and medical student availability.

This study sought to evaluate the applicability and effectiveness of the Food Doctors model in teaching mental health concepts while assessing student satisfaction.

METHODS

Program Design and Implementation

We conducted a literature review to identify age-appropriate topics and developed content focused on emotions, mindfulness, and community wellness for two 1-hour sessions targeting third-grade students (Table 1). Initially designed by medical students, the curriculum was reviewed and approved by community partners, including teachers and principals. The lessons emphasized student engagement through interactive elements, such as question-and-answer presentations and hands-on activities like yoga and the creation of worry stones. Relevant references, including Giannis Antetokounmpo, a professional basketball player for the Milwaukee Bucks, and the Berenstain Bears, were incorporated to illustrate key concepts.

Table 1. Sessions 1 and 2 Concepts and Activities

Concept	Activity
Session 1	
Identifying emotions	Students were presented with images of people and asked to identify emotions being expressed.
Expressing emotions	Students were asked to share how they express specific emotions like happiness, sadness, anger, etc. They were also asked to think about and share how others might express those same emotions.
	Students were asked to draw how they feel when they think of specific emotions such as happiness, sadness, anxiousness, etc.
Practicing mindfulness	Students were given stones and stickers to create a worry stone that could be rubbed for relaxation and anxiety relief.
	Students were introduced to different yoga poses for additional ways to practice mindfulness.
Session 2	
Navigating conflicts	Students were shown cartoon clips from popular shows and were asked to watch them from the perspective of a specific character. Later, they shared their thoughts on how their assigned character must have felt and reflected on what they would have done in a similar situation to better navigate that situation.
Uplifting community members	Students were provided with stickers that had positive expressions written on them. They were then asked to gift the stickers to someone in their life who came to their mind when they read the expression. The objective of this activity was to encourage the students to practice spreading positivity and uplifting their commnity through their actions and words.

Sessions were conducted in 3 classrooms at the Milwaukee Academy of Science and 2 at classrooms St. Marcus Lutheran School, with approximately 25 students per room. Prior to the first session, all students were sent home with a printed consent form outlining programming and research methods for review by their guardians. No guardians declined participation. Students were informed about the programming, and their participation was voluntary.

An amendment to the parent project was approved by the Medical College of Wisconsin's Institutional Review Board (#5) for this study.

Assessment

An 8-question multiple-choice assessment was created to evaluate participants' growth in program learning objectives, which included identifying emotions, acquiring basic factual knowledge about emotions, developing empathy, and resolving conflicts. We aimed to create an assessment that aligned with students' current reading levels, drawing from our experience with them in Food Doctors and our observations of their participation in its assessments, as well as acknowledging the impact of COVID-19 on academic progress. The assessment was reviewed and approved by teachers before it was administered to program participants, which occurred before the first session and after the second session.

In addition to the program assessment, participants completed a survey at the end of each session to assess satisfaction. An example question from the survey was, "Did you have fun during this lesson?" Students responded on a Likert-type scale with options including "not at all," "not really," "maybe," "a little bit," and "yes, absolutely." In addition to this sample question, there were 4 other questions regarding their level of participation, enjoyment of activities, feelings of boredom, and willingness to share what they learned with family and friends, as well as a free-response section where students could share a key takeaway from the session.

Pre-assessment and post-assessment data were analyzed at the group level, ensuring anonymity and without matching individual responses. To identify significant differences, continuous data—specifically pre-assessment and post-assessment scores, were compared between the two groups using an independent samples *t* test in RStudio (Posit PBC). Free-response data from the satisfaction surveys were analyzed thematically to identify emerging themes.

RESULTS

In the pre-assessment (n = 116), the mean percentage of correct answers was 89.3%, compared to 90.7% in the post-assessment (n = 125). A *t* test revealed no statistically significant difference between the two ($P = .43$). Analysis of individual questions showed a significant improvement in scores related to facts about emotions ($P = .03$) and a significant decline in identifying emotions ($P = .03$). Other trends, though not statistically significant,

included increased scores for empathy ($P = .09$) and decreased scores for conflict resolution ($P = .29$) (Figure).

On the satisfaction surveys, the most common response to the question, "Did you have fun in this lesson?" was "Yes, absolutely" (63%). Similarly, when asked, "Did you like how much you were able to talk," "Did you like the activities you did," and "Will you share what you learned with family and friends," the most common response to each question was "Yes, absolutely" (45%, 60%, and 55%, respectively). In response to the question, "Were you bored during this lesson," the most common response was "No, not at all" (40%).

Students' free responses when asked to identify one thing they learned were grouped into 4 key themes. Most students (52.4%) highlighted learning about experiencing, expressing, and managing emotions. Another 24.8% focused on treating others kindly. Mindfulness was a key takeaway for 8.3%, while 14.5% noted other lessons, such as understanding the brain's functions and size, as well as the role of nutrition (Table 2). Notable student quotes included, "I learned that feeling emotions is okay," "Other people have feelings," and "Treat others the way you want to be treated."

Figure. Comparison of Pre-Assessment and Post-Assessment Results

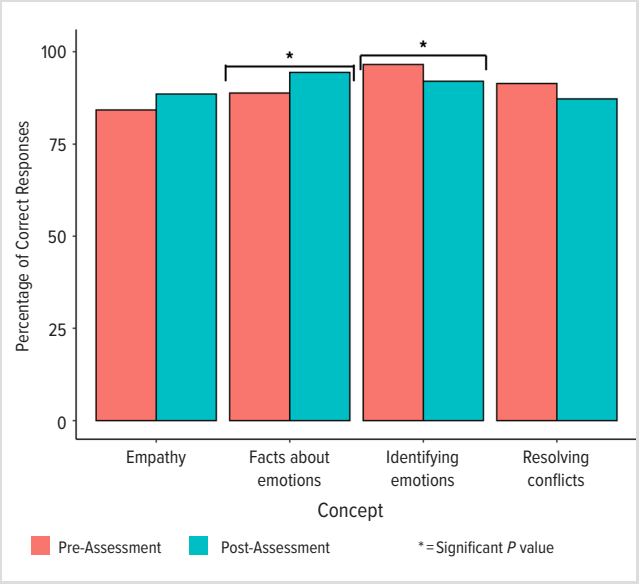

Table 2. Post-Lesson Reflection: What Is One Thing You Learned?

Response Themes	% of Students
Experiencing, expressing, and managing different emotions	52.4
Why and how to treat others kindly	24.8
Mindfulness/mindfulness activities	8.3
Other	14.5

DISCUSSION

This pilot study evaluated the effectiveness of the Brain Doctors curriculum in teaching mental health concepts and gauging student satisfaction. Although pre-assessment and post-assessment scores showed no statistically significant difference, the high baseline scores (89.3% pre-assessment and 90.7% post-assessment averages) suggest that students already had a strong understanding of the material.

Two key factors likely contributed to these high baseline scores. First, previous research highlights how media, including films and television shows, can significantly enhance children's emotional literacy and mental health awareness.[9] For example, Pixar's film Inside Out has become a popular cultural reference for emotional intelligence, introducing young audiences to the importance of understanding and managing emotions. Such media representations helped build a foundational awareness among students before participating in the program.

Second, mental health has been identified as the top health issue in Milwaukee County.[10] The elementary schools involved in the Brain Doctors program are located within this community, where the significant impact of mental health challenges may result in earlier exposure to these topics. This exposure helps normalize conversations about mental health and emotional well-being at a young age.

Most students enjoyed the lessons and activities, though opinions were mixed on participation and sharing what they learned with family. This likely reflects limitations from large class sizes, time constraints, and varying family dynamics. Nevertheless, many students were eager to participate, and community partners at the participating elementary schools highlighted the program's value. The community partners did not receive a satisfaction survey, but feedback was provided regularly with informal and formal check-ins.

Study Limitations

This study has some limitations, including the variation in student participation. As attendance for each lesson could not be controlled, there may be outlying data points, as reflected in the difference in the sample size between the pre- and post-assessments.

Discussions about mental health are crucial, as school environments prioritizing student mental health and well-being can lead to improved classroom behavior, increased school engagement, and stronger peer relationships, which are critical components of academic success.[4] In the future, we plan to address more complex emotional education topics to provide students with more tools to help them navigate emotionally challenging situations. Going forward, to adapt our curriculum, we will trial the curriculum and assessments with a small group of students to ensure they reflect the appropriate difficulty level for the students.

Overall, the elementary students' enthusiasm for the Brain Doctors programming was deeply encouraging. Feedback from

the students and community partners highlighted the value of emotional wellness education. This pilot study reaffirmed our belief that elementary and medical students can meaningfully engage in emotional wellness education and emphasizes the importance of continually adapting such programs to maximize impact.

Funding/Support: None declared.

Financial Disclosures: None declared.

REFERENCES

1. Misiak B, Stańczykiewicz B, Pawlak A, et al. Adverse childhood experiences and low socioeconomic status with respect to allostatic load in adulthood: a systematic review. *Psychoneuroendocrinology*. 2022;136:105602. doi:10.1016/j.psyneuen.2021.105602

2. Maschi T, Baer J, Morrissey MB, Moreno C. The aftermath of childhood trauma on late life mental and physical health: a review of the literature. *Traumatology*. 2013;19(1):49-64. doi:10.1177/1534765612437377

3. Hawkins JD, Catalano RF, Miller JY. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychol Bull.* 1992;112(1):64-105. doi:10.1037/0033-2909.112.1.64

4. Hoover S, Bostic J. Schools as a vital component of the child and adolescent mental health system. *Psychiatr Serv.* 2021;72(1):37-48. doi:10.1176/appi.ps.201900575

5. Bobel E, Otto PE, Brichta C, et al. Food Doctors: measuring one-year retention of nutrition education. Poster presented at: MCW Class of 2020 Scholarship Program; June 27, 2019; Milwaukee, WI.

6. Johnston B, El-Arabi A, Tuomela K, Nelson D. The Food Doctors: a pilot study to connect urban children and medical students using nutrition education. *Health Educ J.* 2018;78(4):441-450. doi:10.1177/0017896918816735

7. Low S, Smolkowski K, Cook C, Desfosses D. Two-year impact of a universal social-emotional learning curriculum: group differences from developmentally sensitive trends over time. *Dev Psychol.* 2019;55(2):415-433. doi:10.1037/dev0000621

8. Cook CR, Low S, Buntain-Ricklefs J, Whitaker K, Pullmann MD, Lally J. Evaluation of second step on early elementary students' academic outcomes: a randomized controlled trial. *Sch Psychol Q.* 2018;33(4):561-572. doi:10.1037/spq0000233

9. Benarous X, Munch G. Inside children's emotions: thoughts on Pixar's Inside Out. *J Dev Behav Pediatr.* 2016;37(6):522. doi:10.1097/DBP.0000000000000312

10. MKE Elevate. Mental Health. City of Milwaukee Health Department; 2023. MKE Elevate Issue Brief. Accessed October 12, 2024. https://city.milwaukee.gov/ImageLibrary/Groups/healthAuthors/MKE-Elevate/MentalHealth.pdf

advancing the art & science of medicine in the midwest

WMJ

WMJ (ISSN 2379-3961) is published through a collaboration between The Medical College of Wisconsin and The University of Wisconsin School of Medicine and Public Health. The mission of *WMJ* is to provide an opportunity to publish original research, case reports, review articles, and essays about current medical and public health issues.

Visit www.wmjonline.org to learn more.