



Effectiveness of Mental Health Education for High School Teachers in Japan: A Prospective Cohort Study

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ABSTRACT

Background: There is a growing demand for mental health literacy in Japanese schools, necessitating educational programs tailored to teachers with insufficient knowledge of mental health.

Aim: This study evaluated the effectiveness of a mental health educational program for high school teachers in enhancing their understanding of student mental health.

Methods: We conducted a single-arm interventional study between 2018 and 2019, evaluating high school teachers' awareness of student mental health before and after participating in a mental health educational program, covering four themes: Suicidal behaviors, behavioral problems associated with developmental disabilities, school absenteeism/social withdrawal, and violent behaviors. Using a mixed-effects linear regression analysis of 130 samples, we assessed the program's effectiveness.

Results: Analysis revealed a significant improvement in mental health knowledge, with an average increase of 1.6 points (9.6% from the pretest average score) on a 24-point scale (95% CI=0.3-3.1, $p<0.02$). Notably, knowledge of suicidal behaviors showed sustained improvement even after 1 year.

Conclusion: The results indicated that the program can enhance educators' knowledge, particularly in understanding suicidal behaviors.

Keywords: School mental health service; Health promotion; High school teachers; Education; Prospective study

INTRODUCTION

50% of mental disorders start by age 14 and 75% by age 24 [1,2].

Among young individuals grappling with mental disorders, many

refrain from seeking help, leaving most disorders untreated [3]. Traditionally, psychiatric conditions in Asian societies have been stigmatized, often perceived as personal weaknesses [4]. This stigma can act as a formidable barrier to seeking medical

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or social support, potentially leading to adverse outcomes, such as suicide, exacerbating the effects of the mental illness itself. Recent efforts to mitigate this stigma include initiatives like mental health education programs in schools and fostering social contact with psychiatric patients [5-7].

Although promoting school mental health in Japan is in its infancy, mental health education programs have been implemented in many countries [6]. In Japan, some discussions of mental disorders and psychiatric care have even been removed from textbooks over the last four decades. To address the persistently high rate of suicide among young individuals, exceeding other causes of death, the Ministry of Health, Labor, and Welfare incorporated a goal in its 2017 suicide prevention guidelines to enhance efforts aimed at preventing suicide among children and adolescents [8]. Subsequently, the Ministry of Education, Culture, Sports, Science and Technology determined that mental health education should be integrated into health and physical education curricula in high schools beginning in 2022 [9].

Despite the increasing demand for mental health education in schools, Japanese teachers still lack sufficient knowledge in this area. They often have limited experience in promoting mental health literacy, which encompasses “knowledge and beliefs about mental health problems aiding in their recognition, management, or prevention” within educational settings. Furthermore, considering that young people spend most of their time in school, teachers occupy a unique position to identify mental health issues and encourage help-seeking behavior [10]. Research has indicated that individuals adequately prepared to assess and respond to psychiatric crises are five times more likely to offer effective assistance compared with those who are not [11]. Accordingly, there is a pressing need for Japanese teachers to possess high levels of mental health literacy, enabling them to effectively recognize mental health concerns in students, facilitate early and appropriate care or treatment-seeking, and feel confident in managing students’ mental health challenges.

Previous studies have focused on developing mental health literacy programs for Japanese teachers [12,13]. There is only one available mental health literacy video program for teachers that are supported by scientific evidence from a randomized controlled study [13]. However, these studies primarily relied on before-and-after comparisons, lacking long-term follow-up data. Given the paucity of evidence on effective mental health education programs for Japanese teachers, assessing the long-term effectiveness of such a program would be useful.

To address societal demands, we initiated a series of meetings called “Association for Cooperation between Medicine and Education (AC-ME) Project” biannually or tri-annually from 2016 to 2018 at Yokohama City University to consider collaboration between the medical and educational sectors and develop mental health education programs for teachers. The project involved local teachers, medical professionals, welfare professionals, and judicial officials. The discussions emphasized the importance of tailoring the program to address mental health issues pertinent to teachers, such as dealing with self-harm or behavioral challenges among students with developmental disorders, rather than focusing

solely on psychiatric disorders like major depressive disorder or schizophrenia. Based on the identified mental health needs within schools, we developed mental health education programs for teachers across four areas: Self-injury/suicide, behavioral issues in students with developmental disabilities, school absenteeism, and violence [14]. These programs were launched in 2018.

Our aim was to create a program tailored to the specific needs of teachers, ensuring its acceptability among them. We hypothesized that teachers’ knowledge of mental health would immediately improve after the lecture and that this effect would be sustained for 1 year following the lecture [15,16].

Moreover, this study determines whether our original mental health education program for high school teachers improved their understanding of school mental health by comparing their knowledge before, immediately after, and 1 year after the program.

MATERIALS AND METHODS

Subjects and Procedures

We conducted a single-arm prospective interventional study with a pre-post study design targeting teachers in a public high school in Japan. Participants were recruited between January 2018 and March 2019. Through school nurses who support AC-ME’s aim, we invited public high school principals in Kanagawa Prefecture (estimated population of 9,237,337 in 2020 in an area of 2,416.2 km₂) to participate.

14 high schools participated in the school mental health program developed by the AC-ME on a comprehensive, school-wide scale. All teachers, including homeroom teachers, principals, and school nurses, were encouraged to participate regardless of their job title. A total of 720 teachers participated in the program at least once between March 2018 and March 2020.

The four-themed program AC-ME project was divided into two parts and spanned 1 year. Each part comprised two sessions per year, with two topics covered in each session. Session 1 focused on “suicidal behaviors” and “behavioral problems associated with developmental disabilities,” whereas Session 2 addressed “school absenteeism/social withdrawal” and “violent behaviors.” Implemented onsite at the schools, each session was facilitated by a child psychiatrist with at least seven years of medical experience, following a manual outlining the lecture’s objectives and schedule. The sessions comprised a 70-min lecture on school mental health, accompanied by group discussions centered on case vignettes. An additional 20 min was allotted for questions and answers.

Knowledge check tests, comprising 6 questions for each topic totaling 24 questions, were administered 1) just before the lecture (pretest), 2) immediately after the lecture (posttest), and 3) just before the booster session held 1 year after all sessions. The inclusion criteria comprised all faculty and staff affiliated with these high schools between January 2018 and March 2019. The exclusion criteria included refusal to provide informed consent and withdrawal from any lecture.

This study was conducted in accordance with the Declaration

of Helsinki and was approved by the ethics committees of Yokohama City University (Approval No. A180300004). The participating high school principals provided informed consent. The school principals informed the participants involved in the AC-ME project about this study, and their consent to participate was confirmed before each test. Moreover, the participants were informed that they could decline without waiving their right to participate in any lectures. This article discloses no personal identifiable data of any participant in any form, strictly observing the participants' confidentiality.

Due to disruptions in school settings caused by the COVID-19 pandemic, such as the challenges of transitioning to online learning and implementing social distancing measures, 5 out of the 14 high schools could not fully participate in all lectures or the follow-up survey. However, 8 full-time high schools and 1 night-time high school participated. Of the 482 teachers in these nine schools, the following were excluded: 110 who refused or declined consent, 208 who dropped out of lectures (68 teachers from Session 1 and 72 teachers from Session 2), and 85 teachers who dropped out from the 1-year follow-up. Some teachers failed to attend the lectures or the 1 year follow up due to workplace transfers and their commitments to supervise club activities and offer academic guidance to students. We excluded 14 teachers with incomplete answers

for acceptability testing for the program. The remaining 130 samples were analyzed in this study (Figure 1).

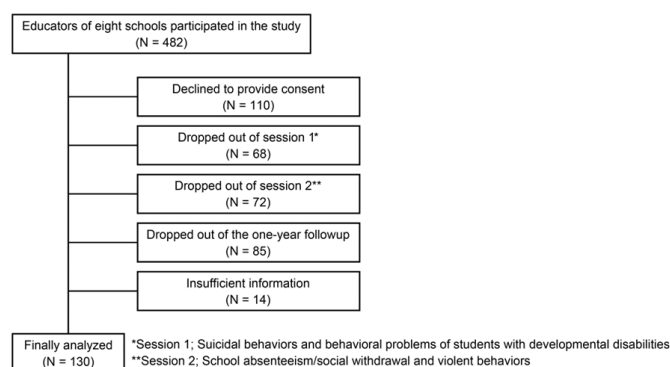


Figure 1: Analysis sessions of educators participated in the study

Table 1 presents the teachers' demographic characteristics. Among all participants, 51.5% were younger than 40 years and 72.3% were male. Additionally, 42.3% of the participants were homeroom teachers. In terms of their experiences of engaging with students who have mental health issues, 79.3% of the participants recalled having such experiences, while 80.8% reported sharing information about their students with mental health problems.

Table 1: Demographic characteristics

		N=130 n (%)
Age (years)	20–29	38 (29.2)
	30–39	29 (22.3)
	40–49	11 (8.5)
	50–59	34 (26.2)
	≥60	18 (13.8)
Sex	Male	94 (72.3)
	Female	36 (27.7)
Job title*	Homeroom teacher	55 (42.3)
	Substitute homeroom teacher	47 (36.2)
	In charge of student counseling and guidance	10 (7.7)
	School nurse	7 (5.4)
	Educational counseling coordinator	6 (4.6)
	School manager	6 (4.6)
	Others	6 (4.6)
Practical challenge in the school	Recallable experiences of engaging with students with mental health problems	103 (79.3)
	Recallable experiences of sharing information about their students with mental health problems	105 (80.8)

Note*: Some teachers hold more than one job title.

Measures

The background assessment comprised three domains. First, the participants completed self-report questionnaires detailing their sociodemographic characteristics, including sex, age, and position in school. Second, the participants were asked about their experiences interacting with students dealing with mental health issues. They were asked, "How many mentally ill students did you have within the past year?" Possible answers to the question were "I do not recollect," "none at all," "one or

two," or "three or more." Third, they were inquired about their experiences sharing information about their students with mental health issues among their colleagues. They were asked, "How many students with mental health problems did you share information about with more than one staff member?" Possible answers to the question were "I do not recollect," "none at all," "one or two," or "three or more." The answers with "one or two" and "three or more" were recallable experiences of engaging with students or sharing information about their students' mental health problems with their colleagues.

The four questionnaire domains asking about mental health knowledge were structured as follows. All questions were addressed in a series of lectures by psychiatrists. Participants were allowed to choose only one answer from a multiple-choice question with three responses. Correct answers were scored 1 point (otherwise scored 0), and the scores were summed. The total score for this domain (0-24 points) represented the participants' knowledge of mental health, which was the primary outcome of this study.

A) Suicidal Behaviors

- Causes of death among 15 to 19-year-old adolescents in Japan
- Biopsychosocial background associated with suicide risk
- Characteristics of self-injury
- Strategies for addressing students' suicidal thoughts
- Necessity of an urgent response to suicidal behavior
- Expected behaviors of teachers when encountering suicidal behavior in a school setting

B) Behavioral Problems of Students with Developmental Disabilities

- Percentage of students facing challenges in Japanese classrooms
- Medical definition of developmental disabilities
- Required support for students with attention-deficit/hyperactivity disorders
- Strategies for handling assignments for students with developmental characteristics
- Communicating the need for medical evaluation of developmental disabilities to parents
- Techniques for facilitating the adjustment of students with developmental disabilities in the classroom

C) School Absenteeism and Social Withdrawal

- Prevalence of school absenteeism among full-time high school students in Japan
- Biopsychosocial background associated with school absenteeism
- Importance of assessing students with frequent school absenteeism
- Support strategies for students with frequent school absenteeism and their families
- Techniques for motivating students experiencing difficulty leaving their homes
- Availability of counseling agencies for adolescents struggling with social withdrawal and school absenteeism

D) Violent Behaviors

- Age group most prone to experiencing violent behaviors in

Japanese schools

- Personality characteristics associated with a higher likelihood of engaging in violent behaviors
- Planning and implementing preventive measures in schools to curb violent behaviors among students
- Initial response expected from teachers to violent behaviors among students
- Effective management of anger to prevent violent behavior
- Medical interventions for patients exhibiting violent behavior

Furthermore, participants' acceptance of the program was assessed immediately after its administration. They were asked questions about the acceptability of the program along with the Attention, Interest, Search, Action, Share (AISAS) model, a marketing process framework [17]. The Likert scale questionnaire comprised five items: "Attention: Do you feel topics related to school mental health attracts your attention?" "Interest: Are you interested in topics related to school mental health?," "Research: Are you willing to do your own research on school mental health topics?" "Action: Would you like to gain knowledge about school mental health topics and engage with students?," and "Share: Are you willing to discuss school mental health topics with someone near you?"

Statistical Analysis

We summarized the participants' characteristics, encompassing sex, age groups, job titles, and their experiences with practical challenges in school. The results of the acceptability questionnaires administered after the program were analyzed to determine the education's effectiveness. Moreover, the program's educational effectiveness was assessed and grouped according to the participants' demographic information and background (age groups, sex, job titles, and practical challenges to students with mental health problems). We used the Mc Nemar test to compare the pre and posttest correct answer response rates and the pre and 1 year after test rates for reference data. Linear mixed models were employed to assess the intervention's effectiveness using knowledge check test scores. The model incorporated a random intercept to account for intra-individual correlation. All participants who answered the questionnaire at the pretest, posttest, and 1-year after test time points were included in the analyses.

We defined the level of significance at $\alpha=0.05$. No adjustments were made for multiple comparisons. All analyses were performed using SPSS version 23.0 (SPSS Statistics for Windows, IBM Corp., Armonk, NY), R version 4.1.0 (R Foundation for Statistical Computing, Vienna, Austria).

RESULTS

Effectiveness of the School Mental Health Program Developed by Ac-Me

The five Likert scales' results that assessed the program's acceptability and the AISAS were favorable overall (Table 2).

Table 2: Assessment of program acceptance according to Attention, Interest, Search, Action, and Share (AISAS) (N=130)

	Mean	SD
Attention: Do school mental health-related topics attract your attention?	4.3	0.7
Interest: Are you interested in topics related to school mental health?	4.3	0.8
Search: Are you willing to conduct your own research on school mental health topics?	3.8	1.0
Action: Would you like to gain knowledge of school mental health topics and engage with students?	4.3	0.8

Share: Are you willing to discuss school mental health topics with others? 4.1 0.9

Note: Rating system: 5-point Likert scale; scores range from 1=strongly disagree to 5=strongly agree.

In 11 of 24 questionnaires, the proportion of participants providing correct answers on the posttest increased relative to the proportion on the pretest. However, in only three questionnaires, the proportion of participants providing correct answers on the 1 year after test increased relative to the proportion on the pretest (**Table S1**).

Table S1: Proportion of participants providing correct answers to each questionnaire section at pretest, posttest, and 1 year after test (N = 130)

	Pre n (%)	Post n (%)	1-year after n (%)
A) Self-injury/suicide among adolescents			
Cause of death among 15-19 year old adolescents in Japan.	87 (66.9)	123 (94.6)*	97 (74.6)*
Biopsychosocial background associated with suicide.	69 (53.1)	93 (71.5)*	70 (53.8)
Characteristics of self-injury.	46 (35.4)	103 (79.2)*	46 (35.4)
How to deal with students' suicidal thoughts.	92 (70.8)	122 (93.8)*	107 (82.3)*
Highly urgent suicidal behavior.	55 (42.3)	85 (66.4)*	61 (46.9)
Expected behavior of educators who encounter suicidal behavior in a school setting.	89 (68.5)	96 (73.8)	77 (59.2)
B) Behavioral problems associated with developmental disabilities			
Percentage of students with difficulties in classrooms in Japan.	67 (51.5)	116 (89.2)*	66 (50.8)
Medical definition of developmental disabilities.	70 (53.8)	100 (76.9)*	60 (46.2)
Expected support for students with attention deficit/hyperactivity disorder.	107 (82.3)	107 (82.3)	118 (90.8)
How to deal with students who cannot complete assignments due to developmental problems.	121 (93.1)	123 (94.6)	124 (95.2)
How to provide information to parents about the need for medical evaluation of developmental disabilities.	119 (91.5)	122 (93.8)	108 (83.1)
How to support students with developmental disabilities adjusting in the classroom.	114 (87.7)	124 (87.7)	115 (85.5)
C) School absenteeism/social withdrawal			
Percentage of students with school absenteeism in full-time high schools in Japan.	92 (70.8)	125 (96.2)*	93 (71.5)
Biopsychosocial background associated with school absenteeism.	114 (87.7)	122 (93.8)	119 (91.5)
Need to assess students with school absenteeism.	100 (76.9)	119 (91.5)*	99 (76.2)
How to support students with school absenteeism and their families.	122 (93.8)	121 (93.1)	122 (93.8)
How to encourage students who have difficulty leaving their homes.	77 (59.2)	78 (60.0)	88 (67.7)
Counseling agency for adolescents with social withdrawal and school absenteeism.	111 (85.4)	107 (82.3)	116 (89.2)
D) Violent behaviors among adolescents			
Age group in which violent behaviors in schools are most likely to occur in Japan.	103 (79.2)	123 (94.6)*	101 (77.7)
Personality characteristics are significantly associated with violent behaviors.	57 (43.8)	83 (63.8)*	73 (56.2)*
Planning and conducting activities in a school to prevent violent behaviors among students.	119 (91.5)	126 (96.9)	123 (94.6)
The expected initial response of educators to violent behaviors among students.	125 (96.2)	128 (98.5)	128 (98.5)
Appropriate way to manage feelings of anger to prevent violent behavior.	129 (99.2)	129 (99.2)	127 (97.7)
Medical treatment for patients with violent behaviors.	79 (60.8)	85 (65.4)	84 (64.6)

The participants' posttest scores improved by an average of 2.7 points (95% confidence interval [CI]=1.3-4.1, $p < 0.01$) from the pretest scores (average score=16.7 points), with a maximum score of 24 points. The participants' 1-year after test score improved by an average of 1.6 points (95% CI=0.3-3.1, $p < 0.02$) over the pretest score. A mixed-effects linear regression analysis assessed the knowledge gained after the

intervention. The total score of mental health knowledge and section A (suicidal behaviors) scores at the posttest and 1 year after test assessments significantly improved relative to the pretest scores (Table 3). Engaging with students with mental health problems or sharing information about their students with their colleagues was not significantly associated with knowledge improvement.

Table 3: Mixed model effects of the acceptability test total score for participants of the Association for Cooperation between Medicine and Education Project

	Adjusted coefficient	95% Confidence interval	p-value
Total score			
Pretest	ref		
Posttest	2.7	1.3–4.1	<0.01
1-year aftertest	1.6	0.3–3.0	0.02
A) Self-injury/suicide among adolescents			
Pretest	ref		
Posttest	1.8	1.1–2.4	<0.01
1-year aftertest	1.0	0.4–1.7	<0.01
B) Behavioral problems with developmental disabilities			
Pretest	ref		
Posttest	0.2	-0.4–0.8	0.46
1-year aftertest	0.0	-0.5–0.6	0.90
C) School absenteeism/social withdrawal			
Pretest	ref		
Posttest	0.5	0.0–1.1	0.06
s	0.2	-0.3–0.8	0.39
D) Violent behaviors among adolescents			
Pretest	ref		
Posttest	0.2	-0.3–0.8	0.43
1-year aftertest	0.3	-0.2–0.9	0.24

Note: Adjusted by age group, sex, job title, and practical challenge experience in a school

DISCUSSION

In this single-arm interventional study with a pre post study design, we evaluated the effectiveness of a school mental health educational program delivered by psychiatrists to high school teachers. The program encompassed four themes for high school students (suicidal behaviors, behavioral problems associated with developmental disabilities, school absenteeism/social withdrawal, and violent behaviors). Majority of teachers who completed the entire program rated their acceptance favorably, and those who participated exhibited knowledge gains immediately after the program and 1 year later. The program was particularly effective on suicide-related topics.

Several previous studies have affirmed that mental health education for teachers effectively improves mental health knowledge to assist students [18]. This study validated that this program was accepted by teachers who completed the program, their knowledge improved significantly immediately after implementation, and their knowledge was retained for at least 1 year. The tailored thematic approach, addressing teachers' needs from diverse perspectives through multi-occupational participation, likely captivated the participants' interest.

Currently, there is an urgent need for suicide prevention in Japanese high schools because several high school teens have committed suicide recently [19]. A previous study verified that stigma-related suicide among Japanese individuals is higher than among Australians and Germans. Part of the challenge stems from Japanese teachers' anxiety regarding addressing suicide within school settings, which hinders the promotion of suicide literacy [20]. A previous study in Australia has provided deep insights into teachers' perspectives on suicide among children and adolescents. Numerous teachers acknowledged the importance of raising awareness and reducing stigma, enhancing student support services, and offering education and training in suicide prevention [21]. The school mental health educational program by the AC-ME project reduced suicide stigma among teachers, which could reduce suicide stigma and promote suicide literacy among Japanese in the future. There may be a particular need for teachers who are confronted with suicidal behavior among students [22].

A systematic review of mental health literacy programs for teachers highlighted that many studies have reported positive effects on knowledge [18]. Furthermore, a previous study reported that the World Health Organization's Eastern Mediterranean Regional Office (EMRO) school mental health

program in Pakistan considerably improved mental health literacy and self-efficacy among teachers, which was largely sustained at a 3 month follow up [23]. The WHO EMRO school mental health program is like the AC-ME program in this study, comprising knowledge provision and case discussions on preventing and supporting children with mental health problems. Another prior study investigated the Well-being in Secondary Education intervention, aimed to improve the support available to teachers for their own mental health and well-being and increases their skills in supporting students. In this training program, passionate teachers are selected, and upon completion, they are motivated to establish dynamic peer groups tailored to each school's context. The program had positive effects among teachers who completed the mental health literacy program on knowledge, attitudes, and helpful assistance for students and maintained positive effects 1 year later [16]. Nevertheless, the program failed to ensure the well-being of teachers or students after revalidation [24]. A school mental health program for teachers that integrates knowledge provision and case discussion may be effective. Moreover, continued peer engagement may positively affect the sustained educational outcomes. While school mental health programs may not completely eradicate the mental health challenges experienced by teachers, the targeted approach of the AC-ME project could contribute to students' well-being by addressing specific needs.

Strengths and Limitations

This study is the first to conduct a long-term follow-up of a school mental health education program for high school teachers conducted in Japan. However, several study limitations should be recognized. First, this study utilized a single-arm design. Previous studies have employed randomized controlled trials, which would be more suitable for reliably evaluating the effectiveness of any intervention [16,23,24]. Second, the departure of 20% of teachers from the program during each session or 1 year after follow-up was influenced by their demanding schedules and issues related to workplace transfers. Preparing a program in line with teachers' working conditions is necessary. Additionally, a previous study reported a high attrition rate from the school mental health program [23]. Further efforts are necessary to transform school culture and positively impact teachers and students regarding efforts to increase knowledge about mental health issues. Third, the importance of addressing self-injury/suicide in the program for high school teachers must be interpreted with caution. Half of the questions in a pretest of the three themes other than self-injury/suicide reached above 80% of the correction rate. While the themes set out in the AC-ME are important mental health issues, behavioral problems with developmental disabilities, school absenteeism/social withdrawal, and violent behaviors among students might be familiar themes for teachers. Fourth, the study outcomes were limited to general mental health knowledge. It may be beneficial to evaluate attitudes, including intentions to assist students, ability to recognize mental health issues, and efforts to combat the stigmatization of students with psychiatric illnesses [13]. A recent study highlighted the need to enhance general mental health knowledge among teachers and knowledge of the laws and processes for accessing community services to support students [25]. Future research

must be conducted with more specific outcomes to improve school mental health for students or teachers.

CONCLUSION

The findings confirm that implementing a school mental health education program delivered by psychiatrists to high school teachers (AC-ME program) may improve teachers' knowledge of mental health issues. Furthermore, the educational effectiveness of the program was particularly noticeable on the topic of suicidal behaviors.

DECLARATIONS

Competing Interests

All authors report no potential conflicts of interest related to this study. The funding source played no role in the study design, the collection, analysis, or interpretation of data, or the decision to submit the article for publication.

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Author Contributions

Conceptualization: JF, TS, HM, YT, and NM; Data curation and formal analysis: JF and YS; Funding acquisition: JF; Investigation: JF, NM, YT, CH, KY, NT, and NN; Methodology and project administration: JF and NM; Resources: JF, NM, YT, CH, KY, NT, and NN; Software: JF and YS; Supervision: AH; Validation and visualization: JF, YS, HM, and TS; Writing-original draft: JF, YS, and TS; and Writing-review and editing: JF, TS, HM, YS, NM, YT, CH, KY, NT, NN, and AH. The authors are grateful to the participants and other members of the research team.

DATA AVAILABILITY

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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