



Effects of the Mental Health Supporter Training Program on mental health-related public stigma among Japanese people: A pretest/posttest study

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Abstract

Aim: The Mental Health Supporter Training Program is a national project conducted in Japan. This study aimed to determine the effects on mental health-related stigma, mental health literacy, and knowledge about mental health difficulties and support techniques among program participants.

Methods: The target population was local residents of a wide range of generations in Japan. Outcomes were assessed at baseline (T1), immediately postintervention (T2), and at the 6-month follow-up (T3). A mixed model for repeated-measures conditional growth model analyses were employed to examine the effects of the intervention over time (T1, T2, T3). We also calculated effect sizes using Cohen's *d*.

Results: The program had a significantly favorable pooled effect on the Japanese version of the Reported and Intended Behaviour Scale score after adjusting for covariates (reported behavior [$t = 3.20$, $p = 0.001$]; intended behavior [$t = 8.04$, $p < 0.001$]). However, when compared at each time point, only intended behavior from T1 to T2 showed a significant difference ($t = 8.37$, $p < 0.001$). Significant pooled effects were found for mental health literacy (knowledge: $t = 19.85$, $p < 0.001$; attitude: $t = 15.02$, $p < 0.001$), knowledge of mental health ($t = 28.04$, $p < 0.001$), and psychological distress ($t = -2.41$, $p = 0.016$).

Conclusion: The results suggest that the program might be effective for improving intended, but not reported, behavior in the short term and for improving mental health literacy, knowledge of mental health, and psychological distress.

Utako Sawada and Mako Iida contributed equally to this study and are designated as co-first authors.

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KEYWORDS

community-based comprehensive care system, intervention, mental health first aid, mental health literacy, public stigma

INTRODUCTION

The stigma of mental health challenges is a global issue, and it can affect various aspects of people with mental health problems, including social exclusion in education, the workplace, and the community.¹ In addition to direct discrimination from others, people with mental illnesses may face structural or systemic discrimination,² including unequal treatment for physical health issues, which can lead to increased morbidity and premature mortality.^{3,4} Stigma against people with mental health problems occurs at three levels: self-stigma, public stigma, and structural discrimination.⁵ “Public stigma” refers to how people in a given community or society view and act toward people with mental health conditions,⁶ and the conceptual framework for public stigma comprises three dimensions: ignorance (a problem of knowledge), prejudice (a problem of negative attitudes), and discrimination (a problem of rejection and avoidant behavior).⁷ Given that the public stigma of mental illness has been described as having a more severe impact than the condition itself, effective interventions to reduce public stigma are needed.⁸

Many interventions have been developed to reduce the negative impacts of public stigma on people with mental health problems. The influential meta-analysis by Corrigan and colleagues and other systematic reviews⁹⁻¹² revealed that interventions for mental health-related public stigma reduction have small to moderate immediate effect sizes. Also, factors such as cultural and social norms, as well as support for public policies related to mental illness, are important to consider in efforts to reduce public stigma.^{1,9,13} Several countries have previously launched public anti-stigma campaigns. For example, the “Time to Change” campaign to reduce public stigma against people with mental health problems was England’s most extensive program and ran from 2007 to 2021.^{14,15} The program focused on public behavior and facilitated social contact and social inclusion of people with mental illnesses.¹⁶ Following the campaign, there was a significant increase in positive attitudes regarding the issues of prejudice and exclusion, and a dose-effect relationship between campaign awareness and regional improvements in knowledge and attitudes, but not intended behavior, was found.¹⁴ The “Opening Minds” program has been implemented as part of Mental Health Canada’s anti-stigma initiative since 2007. The elements of these programs, particularly for healthcare providers, have been investigated, and it was found that emphasizing recovery and including multiple types of social contacts, including a video presentation and presentation of people with the lived experience of mental illness, were particularly important in maximizing the effectiveness of anti-stigma programs.¹⁷

Increasing the mental health literacy of the general population through well-established, standardized mental health literacy programs, such as Mental Health First Aid (MHFA), can also effectively counteract stigma.^{18,19} MHFA was reported to improve the ability of people to recognize a mental disorder in a vignette, change beliefs about treatment to be more like those of health professionals, decrease stigmatizing attitudes, increase confidence in providing help to someone with a mental health problem, and increase the amount of support offered to others,¹⁹ and a later systematic review confirmed that MHFA reduced stigmatizing and social distance attitudes.²⁰ Therefore, the MHFA concept could be helpful in developing interventions aimed at reducing stigma.

In Japan, some anti-stigma intervention studies have been conducted. For example, a randomized controlled trial clarified that repeatedly watching filmed social contact and engaging in Internet-based self-study on mental health-related stigma improved Japanese undergraduate and graduate students’ knowledge of mental health, and watching filmed social contact had a long-term effect on their behavioral intentions.²¹ Similar to previous studies conducted overseas, the results of Japanese studies have suggested that educational lectures or contact-based intervention might reduce public stigma.²¹⁻²⁶ However, no Japanese public anti-stigma projects have been implemented and the settings of these studies were limited. MHFA-Japan has been adapted to the Cabinet Office’s Gatekeeper Program, which is a suicide intervention.²⁷ While a previous pilot trial reported that the program improved participants’ suicide intervention skills,²⁸ the effectiveness of reducing stigma among Japanese residents has not been investigated. In addition, the study participants were limited to undergraduate and graduate students,^{21,25} workers,^{22,24,26} or the parents of middle school or high school students.²³ Thus, an investigation of the impacts of public interventions on the Japanese population, taking into account Japanese culture, is needed.

The Japanese government is currently promoting the need to establish a community-based comprehensive care system that addresses mental disorders.²⁹ Although the Japanese mental health-care system has recently shifted toward promoting community integration, public stigma has long been a major barrier to developing sufficient community resources for mental health services.³⁰ Accordingly, the Mental Health Supporter Training Program project has been implemented as a national project to help raise public awareness sufficiently to establish the need for this comprehensive care system.³¹ The program was developed based on the MHFA and provides training consisting of lectures and workshops to help participants better understand mental illness and learn about support techniques for people with mental health difficulties close to them.³¹

Because the Mental Health Supporter Training Program is a government-promoted program relevant to the Japanese context and issues, it is expected to be effective in reducing mental health-related stigma. However, its effectiveness has yet to be examined.

This study aimed to examine the effects of the Mental Health Supporter Training Program on mental health-related stigma, mental health literacy, and knowledge of mental health among Japanese people. In addition, we investigated the feasibility of the program.

METHODS

Study design and setting

Implementation of the Mental Health Supporter Training Program project began in select municipalities in fiscal year (FY) 2021 as a national project, and its feasibility has been confirmed.³¹ In this study, a single-group pretest/posttest design intervention design was employed to examine the effectiveness of the Mental Health Supporter Training Program conducted in FY2022 (October 2022 to February 2023). The study is reported here in accordance with the Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) statement checklist.³²

Program development

We developed the Mental Health Supporter Training Program, based in part on the MHFA program^{19,33} and with the cooperation of mental health professionals and training implementation specialists. The program consists of lecture contents and workshops on mental illness. Specifically, the following four steps in providing support as a mental health supporter were developed and are considered crucial elements: “notice the person’s mental health status,” “talk to them,” “listen to them attentively and non-judgmentally,” and “give information and encourage them to get support.” Moreover, given that not only educational interventions during lecture contents, but also social contact (including watching videos) and focusing on recovery from mental illness are particularly effective in reducing stigma,^{34,35} we asked three people who had experienced mental illness to share their lived experiences with the program participants. In addition, we incorporated the ARCS (Attention, Relevance, Confidence, Satisfaction) model³⁶ into the program structure to motivate learning. The program consisted of a 90-min common group training content and a 30-min elective group training content, for a total of 2-h of online or face-to-face training. The common training comprised six contents: (1) Goal of the program, (2) What is a mental health supporter? (3) Learning about mental illness, (4) Learning about recovery from mental illness, (5) How to support the mental health of those close to you (the four steps), and (6) Workshops and wrap-up. There were two kinds of elective training available, “Self-care through coping with stress” and “Learning about mental illness,” and the municipality conducting

the training selected which one of these to implement. Details of the program are shown in Table 1.

Before the Mental Health Supporter Training Program could be implemented, it was necessary to train the instructors who would be in charge of training mental health supporters, to ensure the quality of the training and facilitate training in each municipality. Therefore, we developed a Mental Health Supporter Instructor Training Program, which comprised six parts: (1) Overview and goal of the project, (2) Procedure for implementation of the program, (3) Four points for reducing stigma, (4) Four steps of a mental health supporter, (5) Procedure for group work and workshops, and (6) Procedure for elective training. We developed detailed materials for the program and training textbooks for the instructors. The instructor training program consisted of a single 2-h lecture conducted online by a psychiatrist (H. K.) who was familiar with the training. The eligibility criteria for participating in the instructor training program was completing the 12-h MHFA-Japan course. To recruit instructors, we publicized the instructor program through MHFA-Japan. The instructor training program was held four times, once each in August and September 2021 and August and September 2022, and a total of 145 people completed it.

Intervention and participants

The Mental Health Supporter Training Program was a program for the general public. Therefore, the target population was local residents of a wide range of generations in Japan, and there were no exclusion criteria. The Ministry of Health, Labour, and Welfare issued a call for participation in this study to municipalities in Japan, and 18 municipalities took part and organized the implementation of the training program. Each municipality then recruited program participants through its website and flyers, depending on their situation. The programs were conducted from October 2022 to February 2023. The secretariat matched the municipalities’ training schedule with that of the lecturers. A total of 68 training programs were held in 18 municipalities, and 29 of these programs were conducted online to prevent the spread of COVID-19. The number of times each municipality conducted the program ranged from 1 to 14.

To evaluate the effectiveness of the program, we conducted a paper or web-based survey of the program participants at baseline before the training program (T1), immediately postintervention (T2), and at approximately the 6-month follow-up (T3). All surveys were conducted between October 2022 and July 2023. Participants who completed all three surveys received a gift card worth JPY 500. To ensure ethical standards, the survey participants were informed in writing about the purpose and methods of the study and about data storage and privacy protection methods. Informed consent was obtained from all survey participants. This study was approved by the Research Ethics Committee at the National Centre of Neurology and Psychiatry (No. A2021-084). This trial is registered in the Japan Registry of Clinical Trials (No. jRCT1030210433).

TABLE 1 Details of the Mental Health Supporter Training Program.

Contents (Total 2 h)*Select one of the elective trainings	Details
1 Goal of the program (5 min)	Realizing a society where everyone can live comfortably by “acquiring accurate knowledge about mental health” and “learning how to support those close to them.”
2 What is a mental health supporter? (10 min)	Explanation of the role of a mental health supporter: to recognize mental health problems in family members, colleagues, and others close to them and to provide support based on accurate knowledge and understanding, with a focus on attentive listening.
3 Learning about mental illness (5 min)	Overview and epidemiology of mental illness. The goal is for participants to feel that mental illness and mental disorders are not solely someone else’s difficulties, but also their own.
4 Learning about recovery from mental illness (8 min)	Emphasis is placed on recovery from mental illness being a personal process. Brief introduction to the stories of three people who have experienced recovery from mental illness.
5 How to support the mental health of those close to you (15 min)	Explanation of the four steps of a mental health supporter: (1) notice the person’s mental health status, (2) talk to them, (3) listen to them attentively and non-judgmentally, and (4) give information and encourage them to get support.
6 Workshops and wrap-up (45 min)	Watching a specially prepared 3-min demonstration video with examples of good and poor listening skills (10 min). Role-playing active listening in groups of two or three (10 min). Developing an action plan for each of the four steps of a mental health supporter and sharing it with the group members (20 min). Wrap-up (5 min).
Elective Training 1* Self-care through coping with stress (30 min)	Lecture on self-monitoring and stress coping.
Elective Training 2* Learning about mental illness (30 min)	Lecture on 14 common symptoms of mental illness symptoms, including depression and addiction, and tips on how to interact with people with mental illness.

Measurements

Primary outcome measure

We used the Japanese Version of the Reported and Intended Behaviour Scale (RIBS-J) to assess stigma-related outcomes, consisting of two subscales.^{37,38} One subscale consists of four items about reported behavior of past experiences with people with mental health problems: “Are you currently living with, or have you ever lived with, someone with a mental health problem?,” “Are you currently working with, or have you ever worked with, someone with a mental health problem?,” “Do you currently have, or have you ever had, a neighbor with a mental health problem?,” “Do you currently have, or have you ever had, a neighbor with a mental health problem?” This subscale was scored as 1 point for yes answers and 0 points for *no* or *don’t know* answers, with higher scores indicating more past or present contact. The second subscale consists of four items about future behavioral intentions with people with mental health problems: “In the future, I would be willing to live with someone with a mental health problem,” “In the future, I would be willing to work with someone with a mental health problem,” “In the future, I would be willing to live near someone with a mental health problem,” “In the future, I would be willing to continue a relationship with a friend who developed a mental health problem.” The responses were on a 5-point Likert scale (1 = *disagree strongly* to 5 = *strongly agree*), with higher scores

indicating more favorable behavioral intentions. The internal reliability and validity have been established.³⁸

Secondary outcome measures

Mental health literacy was assessed using the Japanese Version of the Mental Health Literacy Scale (MHLS). The MHLS consists of 35 items with six attributes,³⁹ and the Japanese version was developed.⁴⁰ This study used two attributes, knowledge and attitudes: knowledge of how to seek information about mental health information (four items) and attitudes that promote recognition and appropriate help-seeking behavior, and attitudes toward psychological disorders (stigmatization; 16 items). The knowledge attribute (e.g., “I am confident that I know where to seek information about mental illness”) was measured on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*), with higher scores indicating more ability to seek mental health information. The attitude attribute (e.g., “How willing would you be to have someone with a mental illness start working closely with you on a job?”) was measured using the same Likert scales, with higher scores indicating better attitudes that promote recognition, appropriate help-seeking behavior, and attitudes toward psychological disorders. The internal reliability and validity have been confirmed.⁴⁰

Psychological distress was evaluated using the Kessler Psychological Distress Scale 6 (K6).^{41,42} Listening to those around them may

reduce interpersonal conflict and improve their own mental health. Especially if self-care was selected as elective training, the program may reduce the study participants' psychological distress. The scale consists of six items assessing the frequency with which respondents have experienced symptoms of psychological distress during the past 30 days. Responses were measured using a 5-point Likert scale (0 = none of the time to 4 = all of the time), with higher scores indicating more severe psychological distress. The internal reliability and validity have been confirmed.⁴²

Knowledge of mental health was evaluated by asking the participants to answer 17 independent questions developed by the authors. The items are attached in the supplementary material (Supporting Information: Table 1).

In the T2 survey, implementation outcome was assessed using four items from Acceptability, Feasibility, and Satisfaction in the Implementation Outcome Scales for Digital Mental Health (iOSDMH).⁴³

Demographic characteristics (age, gender, educational status, occupation, and interpersonal support experience) were collected in the baseline survey.

Sample size

The sample size necessary to evaluate the primary outcome was determined using the G*Power 3.1 program.^{44,45} The effect size (d) for the sample size calculation was set at 0.39 based on the RIBS-J future domain scores of a previous anti-stigma intervention study conducted with university and college students in Japan.²¹ With an error probability of $\alpha = 0.05$ and 80% power, 54 participants were required for analysis in this study. Assuming an attrition rate of 30%, it was estimated that the final number of participants needed would be approximately 77. Because participants in this study were recruited on a municipal basis as a project conducted by the Ministry of Health, Labour, and Welfare, it was not possible to terminate recruitment when the calculated sample size was reached.

Statistical analysis

Statistical analysis was performed at the individual level. Since the current study has a three-time-point survey, we adopted the mixed model for repeated measures. The conditional growth model was conducted to examine the pooled effect of the intervention. As a sensitivity analysis, the analysis of variance model was used to estimate the fixed effects of a time intervention effect at each survey point. We applied several mixed models to the data: random intercept and random slope, random intercept only, and random slope only. Because neither random intercept and random slope nor random slope only converged, we used random intercept only. A similar analysis adjusted for age and gender was performed to consider factors

influencing the effectiveness of the intervention. Statistical significance in this study was set at the 0.05 level (two-tailed). The linear mixed model in IBM SPSS Statistics Ver. 29.0 was used. We also calculated effect sizes and 95% confidence intervals (95% CIs) using Cohen's d for survey completers at T1, T2, and T3. Values greater than 0.8, 0.5, and 0.2 were considered large, medium, and small, respectively.⁴⁶

RESULTS

Participant characteristics

The participant flowchart is shown in Figure 1. Of the 2493 who applied to the program, 1448 agreed to participate in the study and submitted a consent form (participation rate, 58.1%). Participants completed the baseline survey (T1) and attended the Mental Health Supporter Training Program. A total of 1352 participants (93.4%) and 550 participants (38.0%) completed the T2 survey and T3 survey, respectively. The demographic characteristics of the participants are presented in Table 2. The mean age was 44.7 years, and two-thirds of the sample were women ($n = 846$, 66.7%). A total of 69% of the survey participants opted to attend the "Self-care through coping with stress" as elective training.

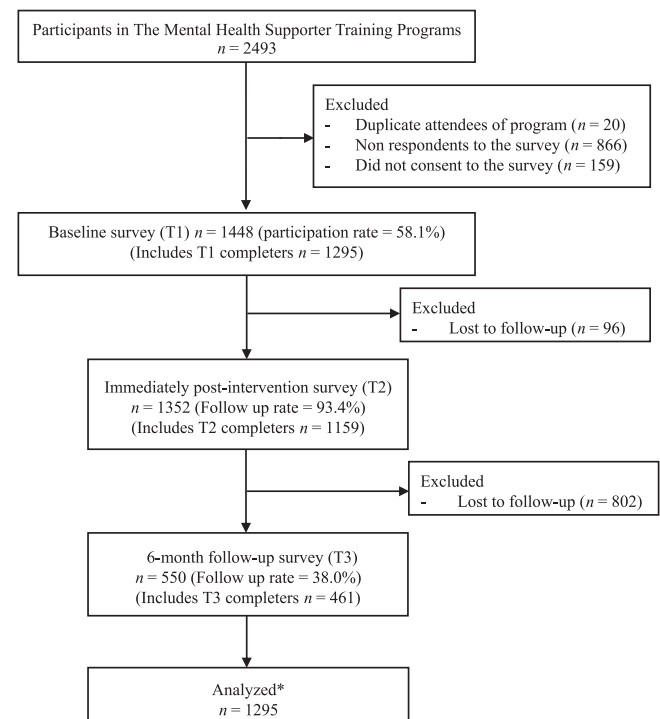


FIGURE 1 Participants flowchart. *The analyses were mixed-model with repeated measures analysis of variance model analyses and mixed-model with repeated measures conditional growth model analyses were conducted after excluding 153 of those who responded to the baseline survey but did not complete the survey.

TABLE 2 Participant characteristics at baseline ($n = 1295$).

	N (%)	Mean (SD)
Age	1295 (100)	44.7 years (14.8 years)
Gender		
Man	426 (32.9)	
Woman	864 (66.7)	
Other	5 (0.4)	
Educational status		
Junior/senior high school or college	435 (33.6)	
University or higher	849 (65.6)	
Other	5 (0.4)	
Missing	6 (0.5)	
Occupation		
Employed/self-employed	940 (72.6)	
Housewife/unemployed	144 (11.1)	
Student	166 (12.8)	
Other	42 (3.2)	
Missing	3 (0.2)	
Interpersonal support experience		
Yes	471 (36.4)	
No	805 (62.2)	
Missing	19 (1.5)	

Abbreviation: SD, standard deviation.

Means (standard deviations) and estimated effects of outcome variables at baseline, immediately postintervention, and at the 6-month follow-up

Table 3 shows the means and standard deviations (SDs) of the outcome variables. The calculated effect sizes are also shown (T2 to T1 and T3 to T1, respectively). Table 4 shows the estimated effects of the intervention program on the outcome variables based on the mixed model analyses.

Effects on primary outcome measure

The mean RIBS-J (intended behavior) score increased from T1 to T2 but returned to the baseline level at T3. The effect size was significant at T2 (Cohen's $d = 0.33$ [95% CI, 0.25, 0.41]) but not at T3 (Cohen's $d = -0.004$ [95% CI, -0.11, 0.10]). The program showed a significant pooled effect on the RIBS-J (intended behavior) before and after adjusting for the covariates ($t = 8.16$, $p < 0.001$; $t = 8.04$, $p < 0.001$). The comparison between the score at T1 and T2 was significant ($p < 0.001$), but not that between T1 and T3 ($p = 0.814$) after adjustment.

The mean RIBS-J (reported behavior) score increased from T1 to T2 and remained essentially the same at T3. However, the effect size was small and was not significant at T2 (Cohen's $d = 0.06$ [95% CI, -0.02, 0.14]) or T3 (Cohen's $d = 0.06$ [95% CI, -0.05, 0.16]). The program showed a significant pooled effect on increasing RIBS-J (reported behavior) before and after adjusting for the covariates ($t = 3.18$, $p = 0.002$; $t = 3.20$, $p < 0.001$). However, differences between the T1 score and the T2 and T3 scores were not significant after adjustment ($p = 0.075$ and $p = 0.276$, respectively).

Effects on secondary outcome measures

MHLS score (knowledge and attitude) increased from T1 to T2 and remained essentially the same at T3. The effect sizes were small to medium and significant for knowledge at T2 (Cohen's $d = 0.58$ [95% CI, 0.50, 0.67]) and T3 (Cohen's $d = 0.49$ [95% CI, 0.39, 0.60]) and attitude at T2 (Cohen's $d = 0.39$ [95% CI, 0.31, 0.47]) and T3 (Cohen's $d = 0.25$ [95% CI, 0.14, 0.35]). The program showed significant pooled effects on MHLS knowledge score before and after adjusting for the covariates ($t = 19.91$, $p < 0.001$; $t = 19.85$, $p < 0.001$) and MHLS attitude score ($t = 15.22$, $p < 0.001$; $t = 15.02$, $p < 0.001$).

Knowledge of mental health increased from T1 to T2 and remained essentially the same at T3 (T2: Cohen's $d = 1.13$ [95% CI, 1.05, 1.22]; T3: Cohen's $d = 0.48$ [95% CI, 0.38, 0.59]). The pooled effect was also significant before and after adjusting for the covariates ($t = 29.01$, $p < 0.001$; $t = 28.04$, $p < 0.001$).

The effect of the program on psychological distress was small but significant at T3 (Cohen's $d = -0.12$ [95% CI, -0.22, -0.01]), and the pooled effect was also significant before and after adjusting for the covariates ($t = -2.61$, $p = 0.009$; $t = -2.41$, $p = 0.016$). However, the difference between T1 and T3 was not significant ($p = 0.059$).

Process evaluation

Table 5 presents the results of implementation outcomes using iOSDMH in respondents who completed the program. A total of 92 participants did not complete all four items for this part. Regarding overall satisfaction, 88% of the respondents answered that they were satisfied or somewhat satisfied with the program. Regarding acceptability, over 90% reported the advantages of it. Regarding feasibility, 90% reported that the program was easy to understand.

DISCUSSION

This pretest/posttest study examined the effects of the Mental Health Supporter Training Program on public stigma and other outcomes (i.e., mental health literacy, knowledge of mental health, and psychological distress) among Japanese people. Although the study found a significantly favorable pooled effect of the program on RIBS-J (both reported behavior and intended behavior), only RIBS-J

TABLE 3 Means (SDs) of outcome variables at baseline, immediately postintervention, and at 6-month follow-up.

	Range	T1	T2	T3	T2-T1	95% CI		Cohen's <i>d</i>	T3-T1	
		<i>n</i> = 1295 Means (SD)	<i>n</i> = 1159 Means (SD)	<i>n</i> = 461 Means (SD)	Cohen's <i>d</i>	Lower	Upper		Lower	Upper
RIBS-J (reported behavior)	0-4	1.73 (1.26)	1.81 (1.26)	1.80 (1.21)	0.06	-0.02	0.14	0.06	-0.05	0.16
RIBS-J (intended behavior)	4-20	14.45 (2.60)	15.28 (2.49)	14.44 (2.61)	0.33	0.25	0.41	-0.004	-0.11	0.10
MHLS (knowledge)	4-20	12.23 (3.27)	14.04 (2.89)	13.82 (3.05)	0.58	0.5	0.67	0.49	0.39	0.60
MHLS (attitude)	16-80	58.28 (7.08)	61.10 (7.34)	60.05 (7.38)	0.39	0.31	0.47	0.25	0.14	0.35
Knowledge of mental health	0-17	12.39 (2.23)	14.68 (1.76)	13.41 (1.70)	1.13	1.05	1.22	0.48	0.38	0.59
K6	0-24	5.03 (4.71)	-	4.49 (4.38)	-	-	-	-0.12	-0.22	-0.01

Note: Means (SD) and Cohen's *d* values were calculated among participants who completed T1, T2, and T3 surveys.

Abbreviations: CI, confidence interval; K6, The Japanese version of the Kessler Psychological Distress Scale 6; MHLS, The Japanese version of the Mental Health Literacy Scale (knowledge: knowledge of how to seek information about mental health information; attitude: attitudes that promote recognition and appropriate help-seeking behavior and attitudes toward psychological disorders), Knowledge of mental health was developed by the authors; RIBS-J, The Japanese Version of the Reported and Intended Behaviour Scale; SD, standard deviation; T1, baseline survey; T2, immediately postintervention survey; T3, 6-month follow-up survey.

(intended behavior) showed a significant difference from T1 to T2. However, significant 6-month improvements were found for mental health literacy, knowledge of mental health, and psychological distress.

The program showed a significant pooled effect on RIBS-J (intended behavior). The adjusted model also showed a significant difference between the score at T1 and T2 and in the effect size. This result is consistent with reports from Japan that a stigma-reduction program was effective in improving RIBS-J (intended behavior).^{21,22,24-26} However, the favorable effect at T2 disappeared at T3, which was inconsistent with a previous randomized controlled trial that showed a significant positive impact for intended behavior at the 24-month follow-up.²¹ There are two possible reasons for this result. The first is the contents of the program. Authors of the previous studies suggested that interventions based on education and contact promotion have come to be considered as an evidential strategy for reducing public stigma.^{9-12,21} Because our program's primary focus was educational and there was only a brief introduction to the experience of people with mental illness, the effect was not maintained by the 6-month follow-up. The second possible explanation is the lack of follow-up. For example, the program of Yamaguchi et al. prepared five follow-up interventions after the initial intervention.²¹ It is possible that the lack of follow-up interventions compared with other programs might have been the reason for the lack of sustained effectiveness.

The program in the present study showed a significant pooled effect on RIBS-J (reported behavior). However, the adjusted model showed no significant impact on differences in the score between T1 and T2 or between T1 and T3, and the effect size was small and insignificant. Given that the Reported Behavior subscale asked whether a respondent had ever had social contact with people with mental health problems in the past, the 6-month follow-up period may have been too short because they may not have had opportunities to interact with people with mental health problems

during that time.³⁸ In addition, because changing problematic behavior with only one intervention may be difficult, follow-up interventions may be necessary.

In terms of the MHLS score, the scores for both knowledge of how to seek information about mental health and anti-stigmatization showed sustained and statistically significant effects throughout the survey period, and the results were significant after adjusting for age and gender. This result is consistent with a previous meta-analysis study²⁰ in which the intervention effect of MHFA on improving mental health literacy was sustained up to 6 months later. It is worth noting that the length of the MHFA programs included in the meta-analysis ranged from 6 to 14 h, whereas the program we developed, which lasted only 2 h, can be considered less burdensome and more effective for the general population. Mental health literacy is a relatively recent concept, but it has important implications for health policy.⁴⁷ Increasing community mental health literacy is expected to contribute to reducing stigma and improving the mental health of individuals and communities.^{47,48} Although there have been interventions to improve the mental health literacy of community residents, no programs have yet had a sustained effect for a period of time longer than 12 months.²⁰ In the future, long-term follow-up studies should be conducted to improve the program contents and evaluate its continued effectiveness on the mental health literacy of local residents.

Knowledge of mental health tended to increase over time, and the pooled effect was significant. The effect size at each time point was medium to large and significant. Given that the questions were originally developed by adjusting for the program contents, this result implies that it might help participants gain and retain the knowledge intended to be provided by this program.

Our program significantly decreased the psychological distress of participants, and the results were significant after adjusting for age and gender. Approximately 70% of the survey participants took the "Self-care through coping with stress" as their elective training. It is

TABLE 4 Effects of the Mental Health Supporter Training Program on mental-health-related stigma, mental health literacy, and psychological distress in the mixed growth model analyses among Japanese people ($n = 1295$).

Variables		Crude						Adjusted ^a						
		Coefficient	SE	95%CI		t	p	Coefficient	SE	95%CI		t	p	
Lower	Upper			Lower	Upper									
RIBS-J (reported behavior)	Fixed effect													
	Intercept	1.69					0.88							
	T2 to T1 ^b	0.08	0.02	0.03	0.13	3.31	<0.001	0.09	0.05	-0.06	0.20	1.78	0.075	
	T3 to T1 ^b	0.05	0.04	-0.02	0.12	1.41	0.159	0.07	0.06	-0.01	0.18	1.09	0.276	
	Pooled ^b	0.05	0.16	0.02	0.08	3.18	0.002	0.05	0.02	0.02	0.08	3.20	0.001	
	Random effect													
	Intercept	1.21						1.14						
	Residual variance	0.36												
	0.36													
RIBS-J (intended behavior)	Fixed effect													
	Intercept	14.26					15.99							
	T2 to T1 ^b	0.81	0.05	0.70	0.93	14.04	<0.001	0.83	0.10	0.63	1.02	8.37	<0.001	
	T3 to T1 ^b	-0.05	0.08	-0.21	0.11	-0.63	0.526	0.03	0.13	-0.23	0.30	0.24	0.814	
	Pooled ^c	0.35	0.04	0.27	0.44	8.16	<0.001	0.35	0.04	0.26	0.43	8.04	<0.001	
	Random effect													
	Intercept	4.39						4.09						
	Residual variance	2.32												
	2.31													
MHLS 1-4 (knowledge)	Fixed effect													
	Intercept	11.33					12.16							
	T2 to T1 ^b	1.78	0.08	1.63	1.93	22.67	<0.001	1.77	0.12	1.53	2.01	14.42	<0.001	
	T3 to T1 ^b	1.52	0.11	1.30	1.74	13.69	<0.001	1.61	0.16	1.29	1.93	9.86	<0.001	
	Pooled ^c	1.16	0.06	1.04	1.27	19.91	<0.001	1.15	0.06	1.04	1.27	19.85	<0.001	
	Random effect													
	Intercept	5.71						5.60						
	Residual variance	4.17												
	4.17													
MHLS (attitude)	Fixed effect													
	Intercept	56.95					61.25							
	T2 to T1 ^b	2.75	0.15	2.45	3.04	18.14	<0.001	2.71	0.28	2.15	3.27	9.54	<0.001	
	T3 to T1 ^b	1.81	0.22	1.39	2.23	8.40	<0.001	1.82	0.38	1.08	2.56	4.83	<0.001	
	Pooled ^c	1.62	0.11	1.41	1.83	15.22	<0.001	1.62	0.11	1.40	1.83	15.02	<0.001	
	Random effect													
	Intercept	38.39						36.20						
	Residual variance	14.99												
	14.99													
Knowledge of mental health	Fixed effect													
	Intercept	11.22					12.23							
	T2 to T1 ^b	2.28	0.06	2.17	2.40	39.63	<0.001	2.26	0.08	2.11	2.42	28.86	<0.001	
	T3 to T1 ^b	0.10	0.08	0.84	1.16	12.23	<0.001	1.03	0.10	0.84	1.22	10.58	<0.001	

TABLE 4 (Continued)

Variables	Crude							Adjusted ^a					
	Coefficient	SE	95%CI		t	p	Coefficient	SE	95%CI		t	p	
Lower			Upper	Lo-					Upper				
Pooled ^c	1.53	0.05	1.42	1.63	29.01	<0.001	1.47	0.05	1.37	1.57	28.04	<0.001	
Random effect													
Intercept	1.43						1.26						
Residual variance	3.14						3.14						
K6													
Fixed effect													
Intercept	5.26						7.47						
T3 to T1 ^b	-0.44	0.18	-0.79	-0.10	-2.53	0.012	-0.44	0.23	-0.90	0.02	-1.89	0.059	
Pooled ^c	-0.22	0.09	-0.39	-0.06	-2.61	0.009	-0.21	0.09	-0.37	-0.04	-2.41	0.016	
Random effect													
Intercept	12.88						12.23						
Residual variance	8.73						8.75						

Abbreviations: CI, confidence interval; K6, The Japanese version of the Kessler Psychological Distress Scale 6; MHLS, The Japanese version of the Mental Health Literacy Scale (knowledge: knowledge of how to seek information about mental health information; attitude: attitudes that promote recognition and appropriate help-seeking behavior and attitudes toward psychological disorders), Knowledge of mental health was developed by the authors; RIBS-J, The Japanese Version of the Reported and Intended Behaviour Scale; SD, standard deviation; T1, baseline survey; T2, immediately postintervention survey; T3, 6-month follow-up survey.

^aAdjusted for gender (man, woman, or other) and age.

^bMixed-model with repeated-measures analysis of variance model analyses were conducted.

^cMixed-model with repeated-measures conditional growth model analyses were conducted.

TABLE 5 Acceptability, feasibility, and satisfaction as determined using the iOSDMH for the program among completed intervention program at T2 (n = 1203).

	Disagree, n (%)	Relatively disagree, n (%)	Relatively agree, n (%)	Agree, n (%)	Preferable responses (%)
1. This program is acceptable for me.	14 (1.1)	20 (1.5)	377 (29.1)	792 (61.2)	90.3
2. I believe this program is easy to use.	15 (1.2)	32 (2.5)	392 (30.3)	794 (59.9)	90.2
3. The program is easy to understand. ^a	17 (1.3)	19 (1.5)	326 (25.2)	840 (64.9)	90.1
4. Overall, I am satisfied with the program.	17 (1.3)	43 (3.3)	361 (27.9)	782 (60.4)	88.3

Note: Respondents with missing values for other items but who responded to iOSDMH were included.

Abbreviation: iOSDMH, Implementation Outcome Scales for Digital Mental Health.

^aThe data for one respondent were missing.

possible that participants used the knowledge and skills they gained from the training to deal with psychological distress in their daily lives after the training. In addition, they may also have been reassured by the fact that the training provided them with the correct knowledge about mental health and that the program aims to create a community where everyone can live with peace of mind, regardless of whether they have a mental illness.

In this study, almost 90% of the participants reported that the program was acceptable and feasible, and the satisfaction rate was 88%, suggesting that this program is user-friendly in terms of implementation. Further study should achieve both a high effect size and high levels of implementation outcomes.

Limitations and future perspective

This study has several limitations. First, there was no control group. Since T2 was measured immediately after the program (2 h later than the baseline survey), it is assumed that there would have been little change even if a control group had been established. However, with respect to the 6-month follow-up survey, the effect of not setting a control group may have been significant: it is unclear whether the change in RIBS-J and other outcomes is due to the intervention program or to other factors, such as natural course or regression to the mean. Thus, the effect of the program could be overestimated. Because the Mental Health Supporter Training Program is conducted

as a project of the Ministry of Health, Labour, and Welfare rather than as academic research, it was not possible to establish a control group. Second, the participants were not randomly selected by each municipality but were volunteers, so it is highly likely that those with a higher interest in mental health participated. Therefore, there is a possibility that the results were overestimated. It is also possible that those who had easier access to information from the municipality may have been more likely to participate in the program. If awareness of this project is increased, it may be easier to access the target population, including those who are in difficult circumstances, to obtain information from the municipality. Third, the follow-up rate was low, although we used a mixed model to account for attrition. Fourth, we used self-reported questionnaires. Although it is not easy to objectively measure changes in stigma and mental health literacy, these might not reflect the participants' actual attitudes and behaviors.

Despite the limitations of this study, it represents the first effort in Japan to evaluate the effectiveness of a program aimed at reducing public stigma associated with mental health in the general population. This research provides preliminary evidence that the program has the potential to reduce public mental health stigma and increase mental health literacy. Evaluating the effectiveness of this program might contribute to community mental health policy in Japan. Based on the results of the study, we modified our program to promote social contact. In the updated program, two persons who had experienced mental illness shared their stories and messages with training participants through videos. Introducing this program in additional municipalities throughout Japan is expected to further improve the program in the future. Although extending lecture hours or adding booster sessions should be considered to improve the effect size, it may increase the burden and reduce the number of participants. Further consideration about this is needed.

CONCLUSION

The results of this pretest/posttest intervention study suggest that the Mental Health Supporter Training Program might be effective for improving intended behavior in the short term, but not reported behavior. In addition, the program might improve mental health literacy, knowledge of mental health, and psychological distress over a 6-month period among local residents who responded to the follow-up survey. However, in this study, there were no definitive conclusions that could be drawn as the effects of the program because the single-arm study design and the high attrition rate at T3 require careful interpretation. Future studies should be conducted with a more robust design and strategies to maintain a high response rate. We should investigate the effects of the updated intervention program.

AUTHOR CONTRIBUTIONS

Daisuke Nishi was responsible for the conduct of this study, supervised the process, and organized the study design. Megumi

Hazumi and Daisuke Nishi wrote the study protocol. Kentaro Usuda, Megumi Hazumi, Emi Okazaki, Kanako Ogura, Mayumi Kataoka, Natsu Sasaki, Yasutaka Ojio, Asami Matsunaga, Ikue Umemoto, Miyuki Makino, Naoaki Kuroda, Hironori Kuga, Chiyo Fujii, and Daisuke Nishi contributed to the development of the program. Kentaro Usuda, Ayako Nakashita, and Chiaki Kamikawa contributed to the data collection. Kentaro Usuda curated the data. Utako Sawada and Mako Iida analyzed the data and wrote the first draft of the manuscript. Kentaro Usuda, Megumi Hazumi, Emi Okazaki, Kanako Ogura, Mayumi Kataoka, Natsu Sasaki, Yasutaka Ojio, Asami Matsunaga, Ikue Umemoto, Miyuki Makino, Ayako Nakashita, Chiaki Kamikawa, Naoaki Kuroda, Hironori Kuga, Chiyo Fujii, and Daisuke Nishi revised the manuscript critically. All authors approved the final version of the manuscript to be published.

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CONFLICT OF INTEREST STATEMENT

Dr Hironori Kuga is an Editorial Board member of *Psychiatry and Clinical Neurosciences Reports* and a co-author of this article. To minimize bias, they were excluded from all editorial decision-making related to the acceptance of this article for publication.

DATA AVAILABILITY STATEMENT

The data are not publicly available due to ethical reasons.

ETHICS APPROVAL STATEMENT

This study was approved by the Research Ethics Committee of the National Centre of Neurology and Psychiatry (No. A2021-084).

PATIENT CONSENT STATEMENT

Informed consent was obtained from all survey participants.

CLINICAL TRIAL REGISTRATION

This trial was registered in the Japan Registry for Clinical Trials (No. jRCT1030210433).

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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