Effectiveness of a co-production with dialogue program for reducing stigma against mental illness: a quasi-experimental study with a pre- and post-test design

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Abstract

For people with mental illness, stigma represents a barrier to social participation. Health professionals, including students, should not hold stigma-based perceptions of such individuals. Further, people with mental illness should not have self-stigma. This study aimed to develop—and examine the effectiveness of—a new program based on co-production with dialogue for reducing stigma among both health science students and people with mental illness. This was a quasi-experimental study, with a pre- and post-test design and no control group. The sample comprised 28 university students majoring in occupational therapy and 20 community-dwelling people with mental illness. The Co-Production with Dialogue Program for Reducing Stigma (CPD-RS) was administered to this sample. Link's Devaluation Discrimination Scale (DDS) was used to assess whether the program reduced stigma. Compared to their pre-intervention scores, the students' post-intervention DDS scores significantly decreased, persisting for at least one month, but those of people with mental illness showed no significant change. Both the students and people with mental illness evaluated the program as “positive” through a questionnaire administered two months after the intervention. These results suggest that the CPD-RS reduces health science students’ stigma toward people with mental illness and fosters mutual understanding among the two groups.

Introduction

The Greeks created the term “stigma” to describe “bodily signs designed to expose something unusual and bad about the moral status of the signier” [1]. When applied to mental illness, stigma refers to social judgment, degradation, or devaluation of individuals because they have symptoms of mental illness or have been labeled as having a mental illness [2]. Stigma has three key components: 1) knowledge issues (ignorance), 2) attitude issues (prejudice), and 3) behavioral issues (discrimination) [3], and can precipitate social exclusion; thus, stigma may make it difficult for people with mental illness to have productive and fulfilling lives [4,5].

Medical practitioners hold varying attitudes toward people with mental illness [6]. Some studies have reported that mental health professionals’ attitudes toward people with mental illness are similar to, and occasionally more negative than, those of the general public; this is contrary to the common assumption that such professionals, as a result of their knowledge of mental illness and daily contact with people experiencing mental illness, have more favorable attitudes toward such people [7,8]. It has also been reported that university students majoring in health science often hold stigmatized views of people with mental illness, suggesting that the current curricula for healthcare providers do not positively influence students in this regard [9,10].

Several interventions have been employed to tackle stigma toward psychiatric illness, including education through lectures and case sessions, and the use of contact-based interventions that involved either direct contact or filmed contact [11,12]. Education is the most commonly implemented stigma-reduction approach and is mostly applied based on etiological models of psychiatric illness [13]. Conceptualizing
mental disorders biologically can represent patients as being physiologically different from “normal” people and as being governed by genetic or neurochemical abnormalities instead of their own human agency; such perceptions can engender negative social attitudes and dehumanization [14,15]. Notably, biogenetic causal beliefs and diagnostic labeling are positively related to prejudiced views among the public, as well as fear and a desire for distance among the victims of such stigma [16]. The video approach is effective in improving attitudes toward persons with mental illness and knowledge about mental illness [17,18], but its effects on actual behavior have not been fully confirmed [18]. The contents of the videos affect the effectiveness of stigma reduction [18,19]. Contact had a relatively stable effect on students’ attitudes and intended behavior that was stronger than the effect of short video interventions [20]. Contact and educational interventions have small to moderate immediate effects on stigma reduction [21]. To drastically reduce stigma, a new program is needed that emphasizes potential recovery from mental illness, as well as multiple types of social contact [22,23], collaborative working, building of partnerships and networks, and involvement with people with lived experiences of mental illness [24,25].

People with mental illnesses often internalize stereotypes about mental illness, a tendency known as self-stigma, which can cause them to experience a loss of self-esteem and self-efficacy [26]. Specifically, higher levels of internalized stigma are associated with lower levels of hope, empowerment, self-esteem, self-efficacy, quality of life, and social support [27]. Furthermore, among outpatients, loneliness, low social support, perceived stigma, experience of stigma, and anticipated stigma reportedly contribute to higher self-stigma [28]. Thus, reducing self-stigma is imperative; consequently, there is a need for strategies and interventions that empower people with mental illness to pursue their life goals [26]. Various interventions have been developed to help reduce self-stigma, including measures based on increasing the understanding of mental illness, providing psychoeducation, and applying cognitive behavioral therapy [29]. Corrigan et al. [26] recommended developing educational programs that teach basic social and coping skills required for personal competence in society. Such programs would allow people to demonstrate their capabilities in critical social situations, thereby increasing their self-esteem and self-perceived value in the community and subsequently reducing self-stigma.

“Co-production” means the establishment of a partnership between healthcare professionals and patients and the mobilization of patient resources to achieve “value co-creation” between them [30]. Meanwhile, dialogue is a therapeutic process that allows all participants to interactively develop the understanding of an issue [31]. We believe that by combining co-production and dialogue in a new stigma-reduction program for both health science students and people with mental illness, co-production of value will occur, which is not possible in conventional stigma-reduction programs, and that mutual understanding will be deepened. This should reduce participants’ stigma toward mental illness and the self-stigma of people with mental illness.

In this study, the Co-Production with Dialogue Program for Reducing Stigma (CPD-RS) was developed. This program targeted both university students majoring in health science and community-dwelling people with mental illness, aiming to reduce stigma toward people with mental illness among the former
group and self-stigma among the latter group. The program aimed to encourage students and people with mental illness to recognize each other as dignified individuals who have similar life problems and use similar coping strategies. This study specifically aimed to test the effectiveness of the program in reducing stigma among both students and people with mental illness.

Methods

2.1. Design and setting

This study featured a quasi-experimental pre- and post-test design and did not include a comparison group. It was conducted at Aino University, Japan, from October 2019 to January 2020.

2.2. Participants

The participants were university students majoring in health science and community-dwelling people with mental illness. The students participating in this study were second-year students who attended a series of lectures on basic psychiatry and occupational therapy, but only had limited contact with people with mental illness. We did not recruit first-year students because their present level of education was regarded as similar to that of the general public. Third- and fourth-year students were excluded from this study because they had contact with patients with mental illness during their preclinical practice.

A class of 40 students is the general size in an occupational therapy department in Japanese universities. We recruited 40 students from a second-year occupational therapy class. Before enrolling in this study, the students received fifteen lectures (90 minutes per lecture) on the basic knowledge of psychiatry (psychiatric illness, symptoms, etiology, and psychiatric treatments) as basic subjects for occupational therapy. With an estimated participation rate of 80%–90% among students, the number of students would result in three–four participants per group. In general, the optimal number of group members is three–eight for group work [32]. Thus, we aimed to recruit 20 people with mental illness living in the community, to ensure that two people with mental illness would be placed in each group. We created flyers for participation in the CPD-RS in collaboration with an institute of Support for Continuous Employment (Type B service) and a psychiatric clinic and asked the staff at each facility to post these flyers to solicit participation. The people with mental illness had diagnoses of either F2 (schizophrenia) or F3 (mood disorder) per the International Classification of Diseases (ICD-10); at the time of the study, all of them were receiving Support for Continuous Employment (Type B services) or engaging in a psychiatric daycare treatment program associated with a psychiatric clinic. Interviews were conducted to confirm that the participants had no communication-related difficulties and understood the study’s purpose.

2.3. Intervention
We designed and implemented the CPD-RS with the aim of promoting mutual understanding between the people with mental illness and the students through co-production with dialogue; we also aimed to reduce the students’ stigma toward people with mental illness and the self-stigma of the people with mental illness. In the CPD-RS, the students and people with mental illness worked in groups to create posters concerning a specific theme. Figure 1 presents an overview of the CPD-RS. The themes for the co-production with dialogue were as follows: (1) coping with daily life and personal problems, (2) problems encountered in interpersonal relationships and means of dealing with them, and (3) how to have fun in daily life. The first author (E.N.) and co-authors (T.H. and M.T.), each of whom have over 10 years of experience in medical and/or rehabilitation practice and/or education, determined the themes using the principles of recovery-oriented mental health practice [33] and the recovery conceptual framework for personal recovery [34,35] as base material. The appropriateness of these themes was confirmed by two health science education professionals who were not involved in this study.

For each of the three themes, the students and people with mental illness wrote their opinions on sticky notes and created posters while engaging in co-production with dialogue. The three principles of co-production with dialogue were: (1) listen to the other person until the end, (2) speak from your own experience, and (3) do not criticize others’ opinions. In the poster-production phase, which was based on co-production, participants considered the experiences and opinions they had written on the sticky notes and sought to identify similar opinions as well as the relationships between their opinions and those of the other members. In the co-production with dialogue process, the students and people with mental illness shared their life experiences and tips on interpersonal relationships and life problems. Co-production with dialogue was conducted for 90 minutes. Two weeks later, each group presented their posters to the other groups. After the presentation, the group members reflected on the posters and their presentations. These group presentations were conducted over a 90-minute period.

2.4. Data collection

The participants’ demographic data (age, gender, diagnosis) were obtained through a questionnaire. The Devaluation Discrimination Scale (DDS), which is a 12-item self-administered questionnaire developed by Link [36], was used to assess the students’ stigma-related perceptions of mental illness and the self-stigma of the people with mental illness. The DDS assesses respondents’ levels of stigma-related attitudes by inquiring into their attitudes toward—and discrimination against—people who have received psychiatric treatment. Respondents are initially presented with a description of the tool, after which they report their level of agreement with each of the 12 statements concerning discrimination and prejudice regarding mental disorders. Responses are given using a four-point scale (Japanese version; 1 = “strongly disagree,” 2 = “slightly disagree,” 3 = “slightly agree,” and 4 = “strongly agree”). Some statements in the questionnaire are reverse scored (R). The 12 statements relate to social intimacy, assessments of intellectual ability, and acceptance of employment for people with mental disabilities. The DDS can also
be used to assess the self-stigma of people with mental illness [37,38]. The Japanese version of the DDS has been reported to be reliable and valid (Cronbach's $\alpha = 0.85, \theta = 0.85$) [39].

The DDS was administered to the participants on four occasions: one month before the intervention (“baseline”; October 2019), immediately before the intervention (“pre-intervention”; November 2019), immediately after the intervention (“post-intervention”; December 2019), and one month after the intervention (“one month after intervention”; January 2020). To ensure that participants’ responses were anonymous, identification numbers were used for all questionnaires rather than names. Participants were also administered a post-intervention questionnaire that aimed to assess their experience of participating in the program. This questionnaire contained six items (focusing on enjoyment of the program, the level of self-expression and mutual interaction in the program, similarities and differences among participants’ life experiences and tips, influences of one’s own experiences, influences of others’ experiences, and willingness to tell others about one’s experience of the program) that were answered using a five-point Likert scale (1 = “very negative,” 5 = “very positive”), and also contained an open-ended question (“How did you feel about participating in the program?”).

2.5. Statistical analysis

Statistical tests were performed by comparing the total DDS scores at four time points (October 2019, November 2019, December 2019, and January 2020). The Shapiro–Wilk test was used to examine whether the acquired data were normally distributed. The comparisons of the four sets of DDS scores, from October to January, were conducted by applying a repeated-measures analysis of variance (ANOVA). Tukey’s multiple comparison test was performed when cases of significant differences emerged through this comparison. Nonparametric tests were performed if the data were not normally distributed. Bonferroni corrections were performed for the results of multiple comparisons and for comparisons of DDS sub-items. For the post-intervention questionnaire, the medians and interquartile ranges were calculated for each item (except the open-ended question). IBM SPSS Statistics for Windows, version 26 (IBM Corp., Armonk, NY, USA) was used to perform statistical analyses. The free text provided in the responses to the open-ended question was summarized.

2.6. Ethics and consent

This study was conducted in accordance with the stipulations of the Declaration of Helsinki. Approval was obtained from the Research Ethics Committee of Aino University (approval no. 2018-21). Individuals who expressed a wish to participate were informed that participation was voluntary and that they could cancel their participation at any time. The research commenced after written consent was obtained from all participants.
Results

3.1. Participants

A total of 48 people participated in the CPD-RS—28 students and 20 community-dwelling people with mental illness. Based on the ICD-10 classification, among the participants with mental illness, 9 had a diagnosis of F2, and 11 had a diagnosis of F3. Participants’ demographic characteristics are shown in Table 1. All participants were randomly assigned to 10 groups. Each group comprised three students and two people with mental illness, except for one group, which comprised four students and two people with mental illness. None of the students or people with mental illness dropped out of the program.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Students (n = 28)</th>
<th>People with mental illness (n = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (%)</td>
<td>11 (39%)</td>
<td>13 (65%)</td>
</tr>
<tr>
<td>Female (%)</td>
<td>17 (61%)</td>
<td>7 (35%)</td>
</tr>
<tr>
<td>Age, years(^a)</td>
<td>20.23 (1.26)</td>
<td>52.25 (9.78)</td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>NA</td>
<td>9</td>
</tr>
<tr>
<td>F3</td>
<td>NA</td>
<td>11</td>
</tr>
</tbody>
</table>

\(^a\) Age is represented as: mean (standard deviation).

3.2. Multiple comparisons from baseline to one month after intervention

The students’ DDS scores at baseline, pre-intervention, post-intervention, and one month after the CPD-RS intervention were compared; all 28 participating students responded to the DDS at each of the four time points. The Shapiro–Wilk test showed that, for all DDS scores, both those of the students and of the people with mental illness, the data were normally distributed; thus, parametric statistics were applied. A repeated-measures ANOVA of DDS scores at baseline, pre-intervention, post-intervention, and one month after intervention revealed a significant difference (p = 0.00014, effect size, \(\eta^2 = 0.06\); Table 2). Tukey’s multiple comparison test was performed for the four time points (Table 3), and Bonferroni’s correction...
was applied to the results of these multiple comparisons. Consequently, the acceptable level of significance was set at 0.0125. There was a significant difference in DDS scores between pre- and post-intervention ($p = 0.0004; \text{effect size}, \Delta = -0.55$) and between pre-intervention and one month after intervention ($p = 0.003; \text{effect size}, \Delta = -0.54$). There was no significant difference in total DDS scores between post-intervention and one month after intervention.

For the DDS sub-items, comparisons were conducted between the pre- and post-intervention scores and between the pre-intervention and one month post-intervention scores; this was performed using Wilcoxon’s signed-rank test. Bonferroni’s correction was applied to the results. Consequently, the acceptable level of significance was set at 0.00416. The results for the comparison between the pre- and post-intervention scores showed that scores for two items reduced significantly after the intervention—specifically, Question 5: “Most people feel that entering a mental hospital is a sign of personal failure” ($p = 0.003; \text{effect size}, r = 0.56$) and Question 6: “Most people would not hire a former mental patient to take care of their children, even if he or she has been well for some time” ($p = 0.0013, r = 0.61$; Table 4). There were no significant changes among the other sub-items.

Additionally, analysis of changes in the patients’ total DDS scores between baseline and one month after intervention showed no significant differences (Table 2).

Table 2. Total DDS scores of the students and people with mental illness across the four time points.

<table>
<thead>
<tr>
<th></th>
<th>Total DDS scores$^a$</th>
<th></th>
<th></th>
<th>One month after intervention</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Pre-intervention</td>
<td>Post-intervention</td>
<td>One month after intervention</td>
<td>p-value$^b$</td>
</tr>
<tr>
<td>Students (n = 28)</td>
<td>29.04 (6.29)</td>
<td>30.21 (6.57)</td>
<td>26.43 (6.29)</td>
<td>26.96 (5.37)</td>
<td>0.00014*</td>
</tr>
<tr>
<td>People with mental</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>illness (n = 20)</td>
<td>31.70 (5.52)</td>
<td>31.40 (6.12)</td>
<td>30.05 (7.20)</td>
<td>31.0 (7.03)</td>
<td>0.61</td>
</tr>
</tbody>
</table>

DDS: Devaluation Discrimination Scale.

a Total DDS scores are represented as: mean (standard deviation).
b p-values were calculated through a repeated-measures analysis of variance (p < 0.05).

Table 3. Multiple comparisons of the students’ total DDS scores across the four time points (N = 28).

<table>
<thead>
<tr>
<th>Period</th>
<th>Comparison</th>
<th>Mean difference</th>
<th>95% confidence intervals for differences</th>
<th>p value&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Baseline</td>
<td>Pre-intervention</td>
<td>−1.18</td>
<td>−3.55</td>
<td>1.19</td>
</tr>
<tr>
<td></td>
<td>Post-intervention</td>
<td>2.61</td>
<td>0.24</td>
<td>4.98</td>
</tr>
<tr>
<td></td>
<td>One month after intervention</td>
<td>2.07</td>
<td>−0.30</td>
<td>4.44</td>
</tr>
<tr>
<td>Pre-intervention</td>
<td>Post-intervention</td>
<td>3.79</td>
<td>1.42</td>
<td>6.16</td>
</tr>
<tr>
<td></td>
<td>One month after intervention</td>
<td>3.25</td>
<td>0.88</td>
<td>5.62</td>
</tr>
<tr>
<td>Post-intervention</td>
<td>One month after intervention</td>
<td>−0.54</td>
<td>−2.91</td>
<td>1.83</td>
</tr>
</tbody>
</table>

<sup>a</sup> p-values were calculated using Tukey’s multiple comparison test (p < 0.05).

<sup>* The Bonferroni method was used, and the p-values were adjusted to 0.0125.

Table 4. Comparison of students’ DDS sub-item scores between the pre- and post-intervention periods (N = 28).

<table>
<thead>
<tr>
<th>DDS item</th>
<th>Pre-intervention&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Post-intervention</th>
<th>p-value&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Most people feel that entering a mental hospital is a sign of personal failure.</td>
<td>2 (2–3)</td>
<td>2 (1–2.8)</td>
<td>0.003*</td>
</tr>
<tr>
<td>6. Most people would not hire a former mental patient to take care of their children, even if he or she has been well for some time.</td>
<td>3 (2–3)</td>
<td>2 (1.3–3)</td>
<td>0.0013*</td>
</tr>
</tbody>
</table>
a DDS sub-item values are presented as: median (interquartile range).

b Comparisons were conducted using Wilcoxon’s signed-rank test.

* The Bonferroni method was used, and the p-values were adjusted to 0.00416.

These two sub-items were scored in the questionnaire as follows: 1 = “strongly disagree,” 2 = “slightly disagree,” 3 = “slightly agree,” 4 = “strongly agree.”

3.3. Participants’ evaluation of the intervention program

Sixteen students and 20 people with mental illness responded to the post-intervention questionnaire. The total scores (presented as median [interquartile range]) for all six items were 4 (4–5) for the students and 3.5 (3–4.5) for the people with mental illness (Table 5).

In the free-text responses to the open-ended question, both students and people with mental illness stated that they enjoyed participating in the program together. Representative comments from the students are: “I was able to talk about life and life problems with people with mental illness,” “I gained the understanding that students and people with mental illness experience similar problems,” “I was surprised that we had many things in common, and that our problems were not so different,” and “The people with mental illness had constructive opinions.” Meanwhile, representative comments from the people with mental illness are: “I felt that both young and not-so-young people experience the same problems with relationships,” “It was good to be able to talk with students who are around my own age,” and “It was good to be able to talk with students who are as old as my own children.”

Table 5. Participants’ evaluations of the CPD-RS.
<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Students</th>
<th>People with mental illness</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n = 16)&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td>(n = 20)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>1. Did you enjoy participating in this activity?</td>
<td>4 (4–5)</td>
<td>4 (3–5)</td>
</tr>
<tr>
<td>2. Did you have sufficient time to talk about your own experiences?</td>
<td>4 (3.8–5)</td>
<td>3.5 (3–4.3)</td>
</tr>
<tr>
<td>3. Did you find that your responses and methods of coping with life problems are similar to those of many other group members?</td>
<td>4 (4–5)</td>
<td>3.5 (3–4.3)</td>
</tr>
<tr>
<td>4. Did you feel that your experiences were helpful to other people?</td>
<td>4 (3–4)</td>
<td>3 (3–4)</td>
</tr>
<tr>
<td>5. Did you feel that the experiences of others were helpful to you?</td>
<td>4.5 (4–5)</td>
<td>4 (3–4.5)</td>
</tr>
<tr>
<td>6. Would you like to share the experiences you had in this class with someone else?</td>
<td>4 (4–5)</td>
<td>3 (3–4.8)</td>
</tr>
<tr>
<td>All items</td>
<td>4 (4–5)</td>
<td>3.5 (3–4.5)</td>
</tr>
</tbody>
</table>

<sup>a</sup> Values are represented as: median (interquartile range).

The six items were scored using a five-point Likert scale (1 = “very negative,” 2 = “negative,” 3 = “neither,” 4 = “positive,” 5 = “very positive”).

**Discussion**

After engaging in the CPD-RS program, the participating students’ total DDS scores showed a significant decrease when compared to their pre-intervention scores, and this reduction effect was sustained for at least one month. These results suggest that the CPD-RS is effective for reducing students’ stigma toward people with mental illness.

During the two months prior to the intervention, the students received lectures on psychiatric disorders and biogenetic epidemiology. However, these lecturers did not induce a significant reduction in the students’ total DDS scores. This is similar to reports from previous studies indicating that providing biogenetic explanations for mental disorders is unlikely to reduce stigma [40]. Moreover, holding biogenetic causal beliefs concerning mental disorders is associated with a greater likelihood of stigma-based perceptions and/or negative attitudes toward mental illness [41]. Combined with previous reports, our results suggest that providing knowledge of psychiatric disorders and biogenetic explanations of these disorders is insufficient for stigma reduction.

The CPD-RS intervention caused a decrease in students’ total DDS scores. This program comprised co-production with dialogue. The cause of the students’ reduced DDS scores may be associated with the
program's characteristics. On investigating the students' DDS sub-item scores, we found significant post-intervention reductions in scores for two items: “Most people feel that entering a mental hospital is a sign of personal failure” and “Most people would not hire a former mental patient to take care of their children, even if he or she has been well for some time.” These results suggest that the students began to feel that mental illness may be curable. The CPD-RS comprises more than just contact with people with mental illness. It is an intervention program that establishes partnerships through co-production [30], and it allows all participants to interactively learn about skills and tips for solving problems in their lives through dialogue[24]. The students’ experiences in this program may have caused them to feel closer to people with mental illness. Knaak et al. [24] mentioned that stigma-reduction programs should emphasize the possibility of recovery from mental illness and that such programs should be “person-centered” and feature multiple forms of social contact. The CPD-RS met these requirements, resulting in its observed effectiveness.

Mehta et al. [42] reported, after a systematic review of interventions for reducing mental health-related stigma and discrimination, that the maintenance effect of attitude and behavioral changes toward people with mental disorders is marginal. However, in the present study, the students’ total DDS scores were not only reduced at the post-intervention time point but also at one month after the intervention. This suggests that the stigma-reduction effect of the CPD-RS persists for at least one month.

For the people with mental illness who participated in this study, there was no significant change in total DDS scores after the intervention, suggesting that the CPD-RS does not improve self-stigma. Various studies have presented recommendations regarding requisites for improving self-stigma; for example, Dubreucq et al. [28] suggested that such programs should be recovery-oriented, while Díaz-Mandado and Perianez [43] suggested that mutual cooperation between participants is needed to foster the understanding of each person's strengths, needs, and goals. The CPD-RS is recovery-oriented and incorporates co-production with dialogue; however, to reduce self-stigma in people with mental illness, making adjustments to the duration and frequency of this intervention may be necessary.

In the questionnaire concerning their experiences of participating in the CPD-RS, which was administered two months after the intervention, the students and people with mental illness reported that they enjoyed the CPD-RS and felt that it facilitated self-expression and interaction. They also stated that they were able to find commonalities between themselves and the other members with respect to approaches for solving life problems. Moreover, they stated that they would like sharing their experiences of participating in this program with others. These findings suggest that the intervention helped remove the division between “us” and “them”—an outcome noted as important by Knaak et al. [24]. Finally, none of the students or people with mental illness who participated in the CPD-RS withdrew from the program due to perceived burden, invasiveness, or stress; this, along with the above results, suggests that the intervention program is feasible, useful, and safe.

There are several limitations to this study. First, since the research method was quasi-experimental and the number of participants was small, a control group could not be established. Second, considering that
among the students, the response rate for the post-intervention questionnaire was 57%, we cannot deny the possibility that the questionnaire results were affected by subject-selection bias. Third, the participants of this study were health science students and people with mental illness known to the examiner; therefore, the risk of examiner-subject bias cannot be denied. Fourth, as the stigma-reducing effect of the intervention was only followed up to four weeks after the intervention, further research is needed to evaluate the maintenance effect beyond four weeks. Therefore, a longitudinal study design featuring a higher number of participants and a control group will be needed in the future. Fifth, the general public also tends to exhibit a strong stigma against people with mental illness; thus, in future research, expanding the target population will be necessary to determine whether the CPD-RS is effective in a general context.

**Conclusion**

The CPD-RS—an intervention method based on co-production with dialogue—can reduce students’ stigma toward people with mental illness, with the effect lasting at least one month after the intervention. The results also suggest that the CPD-RS can be implemented safely.

**Declarations**

Author contributions: EN designed and conducted the study, was involved in data interpretation and drafted the manuscript. MT assisted with the implementation of the study. TH provided guidance throughout all stages of the study and supervised EN and MT. All authors were involved with writing and editing the manuscript. All authors read and approved the final manuscript.

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Institutional Review Board Statement: This study was conducted in accordance with the stipulations of the Declaration of Helsinki. Approval was obtained from the Research Ethics Committee of Aino University (approval no. 2018-21, 21 February 2018).

Informed Consent Statement: Written informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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**Figures**
Figure 1

The Co-Production with Dialogue Program for Reducing Stigma.

Note. Group members: university students (3 students) and people with mental illness (2 people).

Group members implemented co-production with dialogue and created posters.

The themes for co-production with dialogue:

1. Coping with daily life and personal problems.
2. Problems encountered in interpersonal relationships and means of dealing with them.

3. How to have fun in daily life.