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## Public recognition of and attitudes toward suicidality: a study of various factors affecting gatekeeper capability

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### ABSTRACT

**Aim:** In the present study, we aimed to investigate the practical usefulness of a single gatekeeper-training lecture for suicide prevention and examine the potential factors that modulate gatekeeper capability for suicide prevention in the general population.

**Methods:** A 12-item questionnaire, comprising questions about recognition/attitudes regarding suicidality, was administered to 493 members of the general population before and after they attended a gatekeeper-training lecture. Each item was assessed using a 4-point scale (1=very negative, and 4=very positive). For subgrouping of the 12 items, the baseline scores were analyzed using an exploratory factor analysis. With regard to the subscale scores, gender effects were examined by Student's t-test, while the effects of generation and employment/occupation status were tested using ANOVA followed by the Tukey test. Finally, multiple regression analysis was performed to test for the possible determinants of post-lecture recognition, attitude, and approaching skills as gatekeepers for suicide prevention.

**Results:** An exploratory factor analysis of the baseline scores of the 12 items was performed using the following three distinct subscales: the *expressed attitudes*, *cognitive understanding*, and *approaching skills*. Scores of the 12 items improved significantly after the lecture. The older participants (aged  $\geq 60$  years) had lower post-lecture scores in all the subscales than the younger participants. Moreover, at both baseline and post-lecture, medical care professionals scored higher than the unemployed participants and/or employed non-medical workers in all the subscales, while the employed non-medical workers scored higher than the unemployed participants in the *expressed attitudes* subscale. Multiple regression analyses revealed that the score for each subscale post-lecture was strongly dependent on its baseline score, and the baseline score of *expressed attitudes* predicted the post-lecture scores of the other two subscales.

**Conclusion:** The present study suggests that active workers aged  $< 60$  years with positive *expressed attitudes* for suicide prevention gain more educational effects from the gatekeeper-training lecture than the older group (aged  $\geq 60$  years). *Ryukyu Med. J., 39 (1~4) 1~14, 2020*

Key words: suicide prevention, recognition, skill, attitude, education, gatekeeper

## INTRODUCTION

Suicide is a serious global public health issue and has been considered as a critical issue for Japanese people since 1998. Recent reviews of the literature regarding suicide prevention have suggested that restricting access to lethal means of committing suicide is a promising intervention for reducing suicidal behaviors. There is insufficient evidence regarding the efficacy of educational training of medical practitioners or non-medical gatekeeper candidates<sup>1)</sup> although some studies have suggested that educational training is useful for potential gatekeepers to reduce suicidal behaviors<sup>2-3)</sup>.

In general, gatekeepers are considered as community or organization-employed individuals who can communicate with potentially vulnerable populations, identify individuals at risk for suicide, and guide them toward appropriate assessments and treatments<sup>2)</sup>. Several review articles on the general methods of suicide prevention and the United Nations have highly recommended gatekeeper training as the first step in the promotion of suicide prevention<sup>2-4)</sup>. Even a single session of gatekeeper training may have favorable effects on suicide prevention, which has also been supported by worldwide activities<sup>5)</sup>.

Meanwhile, widespread stigma associated with mental health disorders still exists and serves as an additional burden for patients with psychiatric illness. This may not only delay disease recognition and help-seeking action, but also lead to refusal of effective self-help and appropriate support from community resources<sup>6)</sup>. Therefore, as a first step, it is necessary for members of the general public to reduce this stigma and obtain correct knowledge and/or recognition about the nature of mental illnesses as well as learning how to appropriately cope with individuals at risk of suicide at the community level<sup>7)</sup>. One review on educational programs that targeted the general population suggested that these programs modestly improve public knowledge about and attitudes toward depression or suicide<sup>8)</sup>.

The purpose of gatekeeper training is to provide mental health workers and members of the community with the knowledge, attitudes, and skills to identify individuals who are at risk for suicide, assess the risk level, cope with situations, and provide referrals to professionals when necessary. Thus, such

educational training typically covers practical information regarding the general risk factors of suicide, skills of identifying and approaching individuals at risk of suicide, and case management of at-risk individuals, including referral techniques together and information about local community mental health resources<sup>9)</sup>. Gatekeepers are the first responders to at-risk individuals and may belong to different occupational categories; they may be members of the clergy, pharmacists, geriatric caregivers, schoolteachers, personnel staff, and those employed in other institutional settings<sup>2)</sup>. Gatekeepers can have the opportunity to communicate with potentially vulnerable populations and can provide first-aid interventions before mental health professionals are consulted<sup>10)</sup>. In Japan, community nurses, community welfare officers, staff members of the community support center, public servants, and community volunteers, i.e., "Minsei-iin," commonly serve as gatekeepers<sup>11)</sup>. While gatekeeper training has been emphasized to increase the number of supporters and improve the quality of skills among them, research on its practical effectiveness is limited, particularly with regard to the actual impact on suicide prevention<sup>4)</sup>. Furthermore, there are several limitations regarding the potential applicability of such training across various populations belonging to different age groups and occupations<sup>4)</sup>. One study evaluated the educational effects of gatekeeper training among school staff members using the question, persuade, and refer (QPR) triage method and found that the self-reported knowledge, positive appraisals for the efficacy of acquired skills, and awareness of the necessity for service access improved among the participants<sup>12)</sup>. This type of training has been extensively studied by school counselors, educators, and peer supporters, and its positive educational effects on the knowledge, skills, and attitudes have been consistently reported<sup>13-15)</sup>.

Based on the aforementioned literature on public education for suicide prevention, we believe that programs should be designed to reduce the stigmatization of psychiatric illness and suicidality and to encourage the active utilization of local mental health services. Anxiety-provoking situations may increase the anxiety and disappointment in depressed individuals at risk of suicide. Thus, it is important for gatekeeper candidates to have well-prepared recognition/attitudes when interacting

with individuals at risk of suicide. However, only a few studies have evaluated the association between individual gatekeeper capability and recognition of and attitudes toward suicidality. Mental health professionals are trained on how to approach depressed individuals at risk of suicide. However, patients tend to confess first their mental health issue to individuals in their immediate surroundings, such as family members, friends, schoolteachers, office colleagues, community volunteers, and non-psychiatric general practitioners, rather than to mental health professionals. This suggests a simple principle: everyone is a gatekeeper for suicide prevention.

Although the Ministry of Health, Labor, and Welfare has recently developed an educational intervention for gatekeepers who are engaged in activities that promote suicide prevention in Japan<sup>16</sup>, it is difficult to determine the gatekeepers who are highly responsive to such educational intervention and to quantify the intervention effects from aspects of anti-stigmatization. Moreover, the effects of the education regarding practical approaches for individuals with suicidality on the capability of potential gatekeepers have not been fully assessed with respect to the alteration in their understanding of and attitudes toward suicidality. Moreover, the negative effects of generation/gender and employment status on gatekeeper capability should

be examined as the older and middle-aged unemployed men remain at a higher risk of suicide in Japan.

An attitude scale has been developed to measure the stigma associated with suicide in the community<sup>17</sup>. However, to our knowledge, no specific tool exists that assesses the stigma-associated pitfalls of gatekeepers working for suicide prevention with respect to the cognitive attitudinal and behavioral aspects. Thus, we aimed to develop a new scale for rapid assessments of gatekeeper capabilities associated with anti-stigmatized cognition and attitudes. Therefore, the present study aimed to quantify educational effects of an anti-stigma-focused lecture on gatekeeper capability using our original scale and identify gatekeepers who are highly responsive to such educational intervention for suicide prevention.

## METHODS

### Participants

The study was conducted between January 2009 and December 2010. A total of 508 members of the general public who voluntarily participated in our gatekeeper-training lecture (described below) were recruited, and 493 participants responded to the questionnaire (Fig. 1). Informed consent was

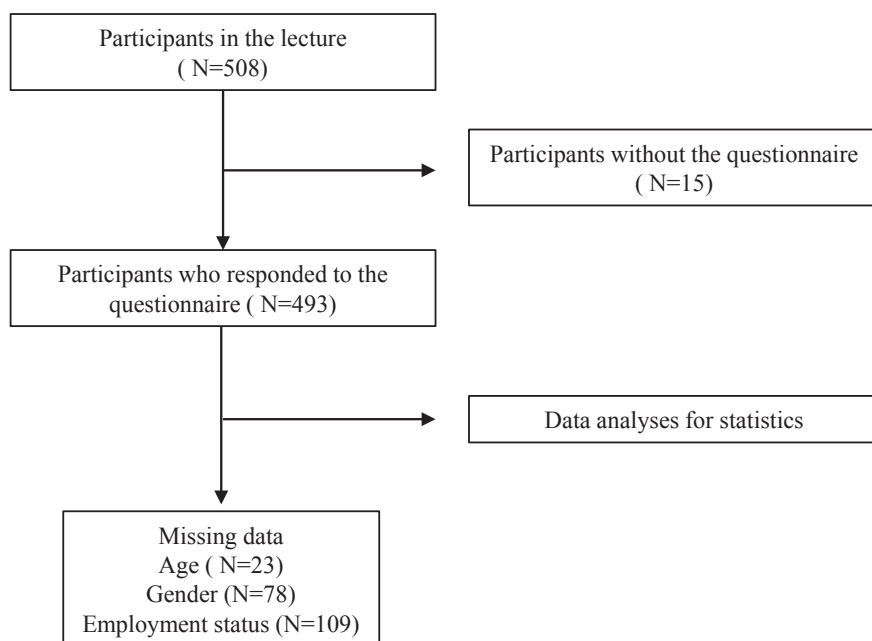


Fig.1 Flowchart of the process of participant selection in the present study

taken before data collection. The study population comprised 130 men and 285 women, while 78 were unable to indicate their gender. The participants were divided into the five groups according to age:  $\leq 29$  years,  $n=65$ ; 30–39 years,  $n=64$ ; 40–49 years,  $n=91$ ; 50–59 years,  $n=145$ ; and age  $\geq 60$  years,  $n=105$ . About 23 participants were unable to indicate their age. Among the participants, 143 were unemployed, 199 were employed non-medical workers, and 42 were medical or health care professionals, while 109 participants were unable to indicate their occupation.

### Gatekeeper-Training Lecture

The same anti-stigma-focused lecture for gatekeeper training (90min) was conducted to all participants by the same lecturer to ensure standardization of the intervention. The lecture sessions were conducted at three different locations on different days between 2009 and 2010. The lecture was entitled, “How to approach depressed individuals who may have suicidal risk.” The learning objectives were as follows: 1) to describe the epidemiology of depression and suicide, 2) to understand the mental state of suicidal individuals, and 3) to learn how to approach individuals at risk of committing suicide. The lecture was designed to provide participants with the necessary knowledge and practical skills for suicide prevention and reduce the stigma associated with depression and suicidality.

### Questionnaire

A questionnaire was administered to each participant before and after the gatekeeper-training lecture (Table 1). The questionnaire comprised 12 items that would help identify suicidal tendencies and understand the attitudes toward suicidality. The questions pertained to the prevalence of suicidality, necessity of verbalization, active questioning, fear of provocation, reluctance to interview, “How to ask” knowledge/skill, distraction, optimism, encouragement, persuasion, criticism, and risk assessments. The questionnaire was designed to evaluate the minimum capabilities necessary in a gatekeeper. The participants’ recognition and attitudes were evaluated using a 4-point scale, with responses ranging from 1 (very negative) to 4 (very positive).

### Statistical Analyses

All the data were treated anonymously during the study. The study protocol was approved by the Ethics Committee of the University of the Ryukyus. The baseline scores for the 12 items were classified into unique subscales with factor analysis using the maximum likelihood method with VARIMAX rotation (Table 2). Student’s t-test and paired t-test were conducted to assess the effects of gender and educational intervention (i.e., baseline versus post-lecture), respectively. Analysis of variance (ANOVA) was used followed by Tukey test as a *post-hoc* analysis for comparing the five age groups (i.e.,  $\leq 29$ , 30–39,

Table 1 **12-item questionnaire assessing recognition/attitude regarding suicidality when facing depressed individuals**

1. Prevalence of suicidality	Do they really have suicidal thoughts?
2. Necessity of verbalization	Do you think they need to talk about suicidality?
3. Active questioning	Do you actively ask about suicidality?
4. Fear of provocation	Are you afraid of enhanced suicidality by asking?
5. Reluctance to interview	Are you reluctant to interview about suicidality?
6. “How to ask” knowledge/skill	Do you know how to ask about suicidality?
7. Distraction	I will change the subjects other than suicidality.
8. Optimism	I will give some optimistic ideas instead.
9. Encouragement	I will encourage patients to change their mind.
10. Persuasion	I will give ethical persuasion not to commit suicide.
11. Criticism	I may criticize suicidality as a wrong idea.
12. Risk assessments	I can correctly assess the risk of suicidality.

Table 2 Factor analysis (VARIMAX rotation) of baseline scores for each of the 12 questionnaire items

	Expressed attitudes (Cronbach's $\alpha=0.90$ )	Cognitive understanding (Cronbach's $\alpha=0.58$ )	Approaching skills (Cronbach's $\alpha=0.63$ )
Encouragement	0.83		
Optimism	0.82		
Criticism	0.77		
Persuasion	0.76		
Distraction	0.67		
Necessity of verbalization		0.68	
Prevalence of suicidality		0.46	
Active questioning		0.45	
Fear of provocation		0.39	
"How to ask" knowledge/skill			0.74
Risk assessment			0.52
Reluctance to interview			0.42
Eigenvalue	4.39	1.79	1.12
% of variance after rotation	26.0	37.3	47.9

Table 3 Employment status in different gender and age groups

	Non-employed Subjects n=143	Employed non-medical Workers (n=199)	Medical care professionals (n=42)	<i>P</i> value
Gender				0.002*
Male	28 (19.6%)	62 (31.2%)	10 (23.8%)	
Female	96 (67.1%)	95 (47.7%)	29 (69.0%)	
Unanswered	19 (13.3%)	42 (21.1%)	3 (7.1%)	
Age				0.001**
≤ 29 years	27 (18.9%)	18 (9.0%)	11 (26.1%)	
30–39 years	9 (6.3%)	31 (15.6%)	10 (23.8%)	
40–49 years	8 (5.6%)	40 (20.1%)	9 (21.4%)	
50–59 years	29 (20.3%)	69 (34.7%)	11 (26.2%)	
≥ 60 years	69 (48.3%)	23 (11.6%)	1 (2.4%)	
Unanswered	1 (0.7%)	18 (9.0%)	0 (0%)	

Data shown in n(%). *P* value > 0.05

\*Significance level of Fisher's exact test

\*\*Significance level of chi-square test

40–49, 50–59, and ≥60 years) and three types of employment/occupation status (i.e., unemployed, employed, and medical care professionals) (Table 3). Multiple regression analysis with forced entry was performed to test for the possible determinants of post-lecture recognition, attitudes, and gatekeeper

skills. Dummy variables such as gender (male: 0, female: 1), age (≤50 years: 0, ≥60 years: 1), employment status (unemployed: 0, employed: 1), and profession (non-medical: 0, medical: 1) and were used to represent the independent variables. A two-tailed *P* value of <0.05 was considered significant. SPSS

16.0 for Windows (SPSS Japan Inc., Tokyo, Japan) was used for all statistical analyses.

## RESULTS

### Factor Analyses of the 12 Items

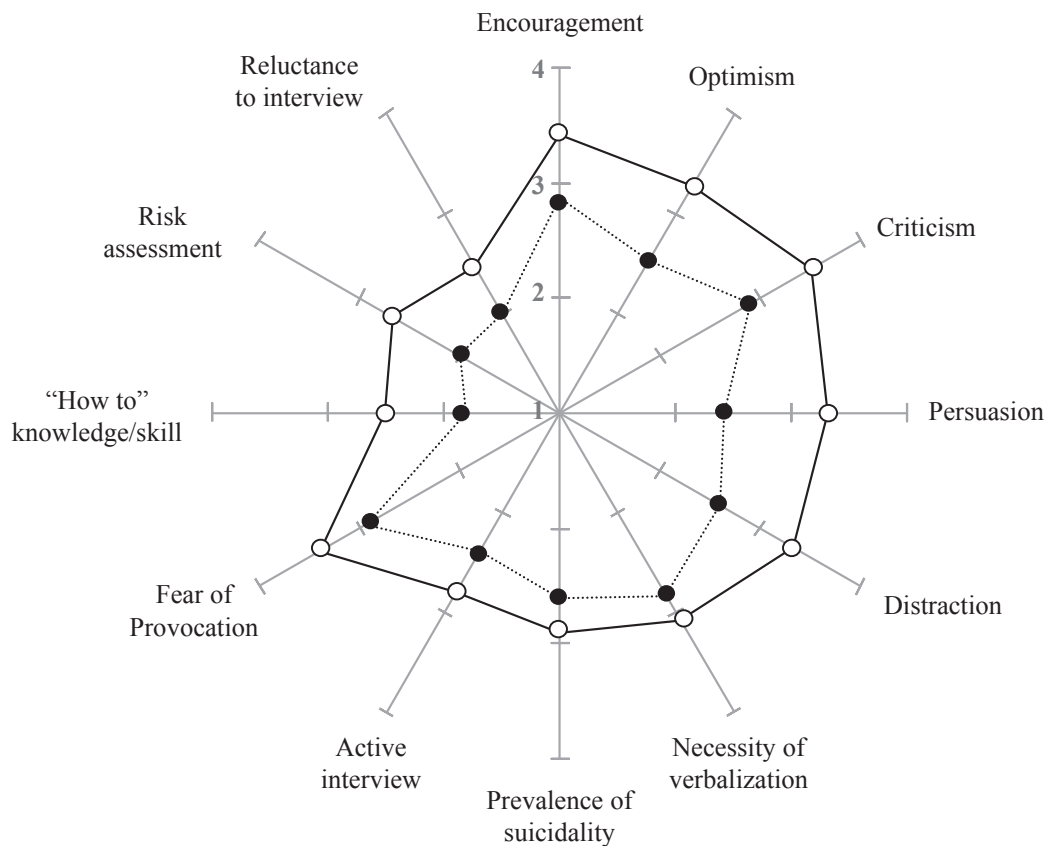
An exploratory factor analysis (VARIMAX rotation) of the baseline scores of the 12 items in the questionnaire revealed 3 distinct subscales (Table 2). These factors were *expressed attitudes* (encouragement, optimism, criticism, persuasion, and distraction; Cronbach's  $\alpha=0.90$ ), *cognitive understanding* (necessity of verbalization, prevalence of suicidality, active questioning, and fear of provocation; Cronbach's  $\alpha=0.58$ ), and *approaching skills* ("How to ask" knowledge/skill, risk assessment, and reluctance to interview; Cronbach's  $\alpha=0.63$ ). In the present study, Cronbach's alpha greater than 0.5 was considered reliable<sup>18</sup>.

### Effects of the Gatekeeper-Training Lecture

Scores of the 12 items before and after the gatekeeper-training lecture are shown in Figure 1. Although the scores on each of the 12 items significantly improved after the lecture ( $P<0.001$ ), both baseline and post-lecture scores of three items under the *approaching skills* subscale (reluctance to interview, "How to ask" knowledge/skill, and risk assessments) were relatively lower than those under the other two subscales (*expressed attitudes* and *cognitive understanding*), as illustrated in Figure 2.

### Influence of Gender and Generation

Although majority of the study participants were women (285 women vs. 130 men), there were no gender differences in the baseline or post-lecture scores in *expressed attitudes*, *cognitive understanding*, and *approaching skills*. In contrast, significant differences were present in scores that emerged



**Fig.2** Changes in the scores of the 12 items in the questionnaire that assessed recognition, attitude, and skills for suicide prevention before (●) and after (○) a gatekeeper-training lecture. Each item score ranged from 1 (very negative) to 4 (very positive). Scores on each item significantly improved after the lecture ( $P<0.001$ ). Both baseline and post-lecture scores were lower in the items of the *approaching skills* subscale ("How to ask" knowledge/skill, risk assessment, and reluctance to interview) than in the items of the other subscales.

among different age groups (Table 4). The older age group ( $\geq 60$  years) showed the lowest subscale score for *expressed attitudes* before and after the lecture among all age groups ( $P < 0.05$ ). Scores for *expressed attitudes* were also the lowest in the group aged  $\geq 60$  years after the lecture ( $P < 0.05$ ). In addition, the group aged  $\geq 60$  years had lower post-lecture scores on *cognitive understanding* ( $P < 0.05$ ) than those aged 40–49 and 50–59 years and on *approaching skills* ( $P < 0.05$ ) than the group aged 40–49 years.

### Influences of Employment and Occupation

Baseline and post-lecture scores of unemployed participants, employed non-medical workers, and non-psychiatric medical care professionals on the *expressed attitudes*, *cognitive understanding*, and *approaching skills* subscale were compared (Table 5). Medical care professionals showed higher scores in each of the three subscales than the other two groups. Meanwhile, the employed non-medical workers had higher baseline and post-lecture subscale scores on

Table 4 Effects of gender and age on the three subscale scores at baseline and post-lecture

	Baseline			Post-lecture		
	Expressed attitudes	Cognitive understanding	Approaching skills	Expressed attitudes	Cognitive understanding	Approaching skills
Total	13.4±4.5	10.8±2.4	5.8±1.8	16.9±4.1*	12.3±2.5**	7.7±1.9***
Gender						
Males (n=130)	12.8±4.9	11.0±2.6	6.0±2.1	16.9±4.3	12.7±2.4	8.1±1.9
Females (n=285)	13.8±4.3	10.8±2.4	5.8±1.7	17.2±3.9	12.3±2.7	7.6±1.8
Age						
$\leq 29$ years (n=65)	15.1±3.9	10.5±2.2	5.8±1.7	18.4±2.6	12.6±2.4	7.9±1.7
30–39 years (n=64)	14.5±3.5	10.4±2.3	6.1±1.6	18.6±2.6	12.4±2.3	7.9±1.8
40–49 years (n=91)	14.2±3.9	11.1±2.3	6.0±1.8	17.8±3.5	12.8±2.4	8.0±1.7
50–59 years (n=145)	13.3±4.8	11.3±2.6	5.9±2.1	17.1±3.8	12.6±2.7	7.7±2.0
$\geq 60$ years (n=105)	11.4±5.0 <sup>c</sup>	10.4±2.2	5.4±1.7	14.2±5.4 <sup>c</sup>	11.4±2.5 <sup>b</sup>	7.2±2.0 <sup>a</sup>

\*Significance from baseline expressed attitudes

\*\*Significance from baseline cognitive understanding

\*\*\*Significance from baseline approaching skills

<sup>a</sup> Significant difference relative to the 40-to-49-year age group ( $P < 0.05$ )

<sup>b</sup> Significant difference relative to the 40-to-49 and 50-to-59-year age groups ( $P < 0.05$ )

<sup>c</sup> Significant difference relative to other age groups ( $P < 0.05$ )

Table 5 Effects of employment/professionalism on the three subscale scores at baseline and post-lecture

	Baseline			Post-lecture		
	Expressed attitudes	Cognitive understanding	Approaching skills	Expressed attitudes	Cognitive understanding	Approaching skills
Non-employed participants (n=143)	12.2±4.6	10.3±2.2	5.5±1.7	15.7±4.8	11.6±2.6	7.2±1.8
Employed non-medical workers (n=199)	13.7±4.5	10.8±2.5	5.8±1.9	17.2±4.1	12.4±2.6	7.7±2.0
Medical care professionals (n=42)	16.1±3.7	11.9±2.4	6.6±1.7	18.4±2.7	13.6±1.7	8.6±1.7
Significant difference ( $P < 0.05$ )	M>E>N	M>E, N	M>E, N	M>E>N	M>E>N	M>E, N

N: non-employed participants, E: employed non-medical workers, M: medical care professionals



*expressed attitudes* and higher post-lecture subscale scores on *cognitive understanding* than the unemployed participants ( $P<0.05$ ).

A one-way ANOVA for repeated measures was conducted to compare the educational effects (amelioration in subscale scores from baseline to post-lecture) among the abovementioned three groups (non-employed, employed, and medical practitioners). Although a significant difference was found between pre- and post-lecture in each subscale score (*expressed attitudes*,  $P<0.001$ ; *cognitive understanding*,  $P<0.001$ ; and *approaching skills*,  $P<0.001$ ), the impact of educational effects did not differ among the three groups.

### Possible Determinants for Gatekeeper Capability

Multiple regression analyses were performed for each post-lecture subscale score (*expressed attitudes*, *cognitive understanding*, or *approaching skills*) as a dependent variable and various influential factors (i.e., gender, age, employment, professionalism, and baseline subscale scores) as independent variables (Table 6). The variance inflation factor (VIF) was employed to check for multicollinearity among the independent variables. None of the VIF values were up to 2. This indicates the absence of collinearity in the model. We found that each subscale score at post-lecture was strongly dependent on its baseline score ( $P<0.001$ ). In

addition, the baseline *expressed attitudes* scores also affected the post-lecture scores for the other two subscales ( $P<0.01$ ). Male gender significantly contributed to higher post-lecture scores in the *approaching skills* subscale, while age  $<60$  years contributed to higher post-lecture scores in the *expressed attitudes* subscale ( $P<0.01$ ).

## DISCUSSION

### Recognition, Attitudes, and Skills as Gatekeeper Capabilities

Capabilities of a comprehensive gatekeeper should ideally include an accurate recognition of depression and suicidality, positive attitude toward individuals at risk of suicide, and acquired skills for suicide prevention. Coincidentally, factor analysis of the 12 items in our questionnaire (Table 1) revealed 3 components (*cognitive understanding*, *expressed attitudes*, and *approaching skills*) that represented these capabilities (Table 2). Therefore, the 12-item questionnaire may cover the necessary components to evaluate the minimum requirements necessary in a gatekeeper and can be used as a qualitative tool to compare interindividual differences and intraindividual changes before and after an intervention.

Table 6 Multiple regression analyses of possible determinants of the three subscales at post-lecture

	Expressed attitudes		Cognitive understanding		Approaching skills	
	$\beta$	$P$	$\beta$	$P$	$\beta$	$P$
Gender (M : F)	-0.029	0.59	-0.071	0.21	-0.152	0.01
Age ( $\leq 59$ : $\geq 60$ )	-0.206	0.001	-0.109	0.07	0.021	0.72
Employment (unemployed:employed)	0.057	0.35	0.085	0.17	0.075	0.22
Professionalism (non-medical:medical)	-0.019	0.74	0.02	0.73	0.096	0.09
Baseline subscale scores						
Expressed attitudes	0.515	$<0.001$	0.168	0.01	0.198	0.001
Cognitive understanding	0.083	0.16	0.413	$<0.001$	0.097	0.11
Approaching skills	-0.101	0.1	0.027	0.67	0.36	$<0.001$
	R=0.61, $R^2=0.38$ F=20.0, $P<0.001$		R=0.59, $R^2=0.35$ F=17.4, $P<0.001$		R=0.60, $R^2=0.36$ F=18.7, $P<0.001$	

$\beta$  : standardized partial regression coefficient

### **Efficacy and Limitation of the Single Educational Lecture**

The present study demonstrated that even a single educational lecture can considerably change the recognition, attitude, and skills for suicide prevention. Therefore, an anti-stigma-focused lecture that provides coping skill appears useful for the members of the general public to improve their ability as gatekeepers for suicide prevention. However, the participants' scores in the *approaching skills* subscale were lower than those in the *expressed attitudes* and *cognitive understanding* subscales even after the lecture (Fig. 1). There are at least two possibilities that can be considered for the lesser gains in *approaching skills*. First, our lecture may not have provided enough time and sufficient content on coping skill education for the beneficiaries to achieve self-confidence on their *approaching skills*. Second, active learning to acquire peer-supporting capability (e.g., a role-playing session) may be more helpful in improving the skills of potential gatekeepers rather than passive methods such as lectures. Therefore, the skills of asking and assessing suicidal risks should be the focus of a separate session, preferably using the style of a small-group simulation skills training. Moreover, such education may also include practical information regarding referral to local community resource centers (e.g., psychiatric clinic/hospital, public health center, and emergency telephone services) with their telephone numbers and addresses<sup>10</sup>, so that gatekeepers are well prepared to deal with a suicide crisis.

### **Influential Factors (Gender, Age, and Employment/Occupation)**

Participants of this gatekeeper-training lecture were originally interested in and highly motivated to work toward suicide prevention. Therefore, the factors that influenced the alteration in recognition, attitudes, and skills following the educational intervention in these participants may not be applicable to the general population. In general, women appeared more interested in such educational lectures, as indicated by the fact that most of the audience members who attended our lectures were women. However, unexpectedly, the male participants had more favorable post-lecture scores in the *approaching skills* subscale, according to multiple regression analysis (Table 6). Thus,

although male participants were fewer than female participants, they may have had higher motivation to obtain skills for suicide prevention with more awareness of responsibility than female participants.

The older participants (i.e., aged  $\geq 60$  years) had lower post-lecture scores in recognition, attitudes, and skills for suicide prevention after the educational intervention than the younger generation (Table 4). This result may be at least partially explained by the fact that cognitive inflexibility is commonly observed in the older population, even in the absence of disease<sup>19</sup>. Another underlying reason may be their lack of awareness regarding depression as a treatable disease<sup>20</sup>. Incorrect perceptions on suicide (e.g., it is not preventable or it is a weak individual's choice) seemed more prevalent among the older population and lead to a nihilistic attitude and a feeling of shame in seeking help even when distressed. For example, previous studies showed that depressed older individuals are less likely to seek necessary psychiatric treatments and have high suicide rates<sup>21-22</sup>. These findings suggest that the interventions for gatekeepers need to be modified accordingly when they are administered to older volunteers. Meanwhile, a majority of suicide victims particularly older victims, communicated with primary care providers<sup>23</sup>. Well-educated primary care providers may therefore play a critical role in lowering the rates of suicides due to depression<sup>24-26</sup>. In Japan, there is an active system for community-based volunteers, "Minsei-iin," who regularly travel throughout the community and visit disabled or isolated older residents. This self-help function performed by the same generation may have benefits for the support system in local communities<sup>27</sup>. However, considering that their age range peaks between 65 and 69 years<sup>11</sup>, an intervention that is more effective and simplified than our gatekeeper-training lecture should be provided to educate older volunteers regarding suicide prevention. Oyama et al. reported that community-based screening and follow-up for depressive disorders by medical professionals were consistently effective for suicide prevention in the older population<sup>28</sup>, implying that gatekeeper training for suicide prevention should target general practitioners rather than non-medical older volunteers.

In fact, the present study clearly demonstrated that medical care professionals maintained the

highest scores in the *expressed attitudes*, *cognitive understanding*, and *approaching skills* subscales before and after the education training on suicide prevention (Table 5). It is not surprising that medical care professionals had superior recognition, attitudes, and skills for suicide prevention because they have greater knowledge and experience with respect to depression in the context of a medical model. Moreover, medical care professionals may be more motivated and have a higher feeling of responsibility as primary gatekeepers. Thus, our educational lecture may have further augmented their preexisting gatekeeper capability. Meanwhile, employed non-medical workers showed higher recognition and better attitudes for suicide prevention than unemployed participants after the lecture. This may be partially attributed to the fact that >50% of the suicide victims in Japan are unemployed people, which may be due to the highly stressful situations and decreased awareness on depression/suicidality<sup>22</sup>. Furthermore, active workers may be more interested in or sensitive to their own mental health issues or those of their colleagues. Therefore, they may be more likely to expect to serve as a motivated gatekeeper in the workplace.

### Possible Determinants for Gatekeeper Capability

Multiple regression analyses revealed that each subscale score at post-lecture was strongly dependent on its baseline score (Table 6). In keeping with previous reports<sup>12, 29</sup>, the educational effects for recognition, attitudes, and skills were dependent on the participants' baseline gatekeeper capability. In particular, the baseline scores for *expressed attitudes* also significantly affected the post-interventional improvement in *cognitive understanding* and *approaching Skills* (Table 6). *Expressed attitudes* include active listening and being sympathetic, which are definitely unaffected by inner or reactive anxiety. Therefore, *expressed attitudes* appear to be an essential component of comprehensive gatekeeper capability and are necessary while approaching and managing patients at risk of suicide, as suggested in a previous study<sup>30</sup>.

Multiple regression analyses demonstrated the significant effects of generation and gender on *expressed attitudes* and *approaching Skills*, respectively (Table 6). The negative effects of aging

on *expressed attitudes* may be partially attributable to the lesser improvement in general gatekeeper capability among older participants (Table 4), as mentioned above. The positive effects of male gender on *approaching skill* were unexpected. When a less experienced gatekeeper faces an individual with suicidal ideation and asks about suicidality, the gatekeeper would tend to feel more anxiety and fearful than a more experienced gatekeeper. Harm avoidance in men is consistently lower than that in women, according to the Temperament and Character Inventory, a tool that assesses personality dimensions<sup>31, 32</sup>. Because men generally feel less anxiety or fearful than women in a critical situation such as a crisis intervention, rational skills training for suicide prevention may be more suitable for men, particularly for those with higher motivation and responsibility<sup>33</sup>.

### LIMITATIONS

The present study has several limitations. First, our original scale assessing cognition and attitudes associated with stigma of suicide in gatekeepers may need further validation in other different participants to evaluate its stability with respect to variables, construct/criterion validity, and ceiling effect. Second, in the present study, information regarding the economic status, education level, and experiences of communication with psychiatric patients were not investigated among the participants; this may have influenced their cognition and attitudes. Third, this study only examined the acute effects of a single educational lecture on gatekeeper capability. Although previous studies have shown that a single program demonstrates adequate improvement in gatekeeper skills even after the training<sup>34, 35</sup>, long-term effects of the lecture and the necessity or further intervention should be clarified in future studies<sup>36</sup>. Fourth, previous participation in other gatekeeper-training programs was not checked in this study. Thus, the possibility that additional or synergistic effects of combined intervention might have affected the results cannot be entirely ruled out. Fifth, the main outcome of our study was an intermediate improvement in the participants' awareness in recognition, attitudes, and skills for suicide prevention. Suicide prevention programs have achieved a sustained decline in the rate of completed

and attempted suicides, according to previous cohort studies conducted on the United States Air Force personnel<sup>37)</sup> and in a tribal nation<sup>38)</sup>; therefore, the final outcome of preventative effects should ideally be evaluated as the number/rate of suicide-related events. Therefore, future studies should evaluate the practical effects of intensive intervention on the rates of suicidality in a localized area or in a limited workplace. Sixth, the methodology of gatekeeper-training education has not yet been well standardized and established. Therefore, the quality and validity of our educational lecture for gatekeeper training are not fully validated, although there were significant improvements in the present study. Future studies should examine the optimal time and content required for conducting an educational program, the number of interventions required, and the adequate timing/method for the assessments of the effects.

## CONCLUSION

The findings of the present study suggest that active workers aged <60 years with positive *expressed attitudes* for suicide prevention gain more benefits from our single educational lecture than older participants ( $\geq 60$  years old).

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