Regular Article

Effects of an educational program on public attitudes towards mental illness

GORO TANAKA, OTR, MS,[1] TAKEO OGAWA, PhD,[2] HIROYUKI INADOMI, OTR, MS,[1] YASUKI KIKUCHI, PhD[1] AND YASUYUKI OHTA, MD, PhD[1]

[1]*School of Health Sciences, Nagasaki University, Nagasaki and* [2]*Graduate School of Human Environmental Studies, Kyushu University, Fukuoka, Japan*

Abstract   The World Psychiatric Association promotes global anti-stigma programs. However, evaluation research is crucial to developing effective programs. The present study examined the effects of a lecture on mental health on public attitudes towards mental illness. Subjects were recruited from individuals employed by private companies and the government. Attitudes towards mental illness were measured using the Mental Illness and Disorder Understanding Scale developed by the authors and the Scale of Negative Attitudes Towards the Independence of People with Mental Disorders. Test scores obtained before and after the lecture were compared. The results demonstrated that scores on both scales improved significantly. The present study suggests the effectiveness of this type of educational program in reducing stigma attached to mental illness and disorder.

Key words   educational program, evaluation research, mental health, public attitudes towards mental illness, stigma.

INTRODUCTION

One of the biggest obstacles to providing community support to people with mental illness is restricted social participation due to stigma associated with mental illness. It is assumed that this stigma may not only obstruct social participation but also delay medical treatment being sought at the onset of illness and hence result in symptoms being aggravated. Consequently, removing this stigma may reduce the reluctance to seek psychiatric treatment and as a result improve effectiveness of treatment. In evaluating the current situation, it is extremely important to investigate the factors associated with public attitudes towards mental illness and to search for strategies to reduce stigma.[1–3] In order to address these issues and to reduce stigma towards mental illness, the World Health Organization (WHO)[1] and the World Psychiatric Association (WPA)[3–6] have conducted a global anti-stigma campaign. Similarly in Japan, facilities such as health centers have committed themselves to holding many types of educational programs aimed at people in local communities (e.g. lectures, training courses and contact programs). It is essential to evaluate the effectiveness of each program in order to plan services more effectively. However, although reports evaluating the effectiveness of educational programs have been published in other countries,[7,8] apart from a report describing the effects of such programs on attitudes of certain students, the impact of such programs on the public has not been evaluated in Japan.[9–11]

The authors have previously developed the Mental Illness and Disorder Understanding Scale (MIDUS) that can be used as an indicator in evaluating educational programs held to facilitate the proper understanding of mental illness and to reduce stigma.[12] The present study attempted to determine the effects of an educational lecture on mental health and welfare, the most commonly held educational program, using the aforementioned scale.

METHODS

The study was conducted in six locations in prefecture N in which each lecture was given by a different lec-

turer to a different audience. The subjects were audiences consisting of industrial workers and government employees and 1.5 h lectures were given by either a medical doctor or public health nurse. The lecture was given on request by each facility to the mental health and welfare center or the health center. At each lecture, a 24-page pamphlet entitled *What is Mental Health? – Towards an Easy Understanding of Mental Health* was handed to each subject and an explanation of it was given by the lecturer. This pamphlet was produced by the N prefectural mental health center in 2000 and was composed of chapters including (i) 'What is mental health?'; (ii) 'How to get along when under stress'; (iii) 'How to maintain one's mental health'; (iv) 'Understanding mental illness properly'; (v) 'Brief information about various forms of mental illness'; and (vi) 'Evaluating your own mental health'.

The following items were evaluated: (i) MIDUS, developed previously by the authors; (ii) Scale of Negative Attitudes Towards the Independence of People with Mental Disorders (Negative Attitudes Scale), developed by the National Federation of Families of the Mentally Ill in Japan;[13] (iii) psychiatric treatment-seeking behavior; and (iv) social background of the subjects (such as age, gender, level of participation in voluntary activities for the disabled, aged and/or children, past attendance of educational lectures and training programs regarding mental health and welfare, past participation in contact programs with people with mental illness, and experience of contact with people with mental illness).

The MIDUS consists of 15 items and the responses to these items were rated using a 5-point Likert scale (0, 'strongly agree'; 1, 'tend to agree'; 2, 'neither agree nor disagree'; 3, 'tend to disagree'; and 4, 'strongly disagree'). In this scale, lower total scores indicate better understanding. Factor analysis with principal component analysis and varimax rotation was conducted for this scale. Three factors with eigen values of 1 or higher were extracted and named 'treatability of illness', 'efficacy of medication', and 'social recognition of illness'.[12] The Negative Attitudes Scale consists of 10 items and the responses to these 10 questions were rated using a 3-point Likert scale (2, 'agree'; 1, 'neither agree nor disagree'; and 0, 'disagree': four reverse scoring questions). In this scale, higher scores suggest a more negative attitude. The reliability and validity of both scales have been confirmed.[12,13] Regarding psychiatric treatment-seeking behavior, participants were asked to respond to the statement 'If I experienced mental distress (insomnia, poor appetite, depression), I would visit a psychiatric facility.' The responses were rated using a 5-point Likert scale (0, 'strongly agree'; 1, 'tend to agree'; 2, 'neither agree nor disagree'; 3, 'tend to dis-

agree'; and 4, 'strongly disagree'). Higher total scores thus indicate greater reluctance to visit a psychiatric facility.

Before the lecture in each location, a questionnaire form was supplied to each subject and the investigator read out and explained the purpose of the study to obtain consent from the subjects. The investigator then read out one question item and asked the subjects to respond to that item and repeated this process for each item. After the lecture, the subjects responded to another questionnaire in the same way. In order to detect the change of attitude of individuals before and after the lecture while maintaining anonymity, the questionnaire forms for before and after the lecture were delivered together as a set and were both recovered at the same time after completion of the form. The study was conducted during the period from November 2001 to February 2002.

The effect of the educational lecture was evaluated by comparison of the ratings of the scales before and after the lecture, using a pre- and post-questionnaire study design.[14] Statistical analyses were performed using a Wilcoxon test and Fisher's exact test. $P < 0.05$ was regarded as statistically significant. All analyses were performed using SPSS 11.0 J for Windows (SPSS Japan, Tokyo, Japan).

RESULTS

Table 1 shows the background of the subjects in the six locations studied. Individuals who responded to all 25 items of each of the scales both before and after the lecture were regarded as valid responders. The valid response rate in each research group was in the range of 86.1–100%. The characteristics of valid responders are given in Table 1. In each research group, more men than women responded, with average ages of participants ranging from 39.1 to 44.1 years. Of the valid respondents, 37.8–69% had experience of contact with people with mental disorders, 15–54.8% had previously participated in an educational lecture regarding mental health and welfare, 28.9–51.7% had experience of participation in a voluntary activity and 2.2–29% had attended a contact program with people with mental illness.

Table 2 shows the difference in total scores for MIDUS before and after the lecture in each research group. In all research groups, the level of understanding improved significantly ($P < 0.001$). Table 3 indicates the difference in the total scores for the Negative Attitudes Scale before and after the lecture. Attitudes toward the independence of people with mental disorders became significantly more positive ($P = 0.000$–0.015) except in research group 4. Table 4 indicates the

Table 1. Basic characteristics of the research and subjects

Research no.	1	2	3	4	5	6
Location	A company	B city office	C public institution	D town office	D town office	E city office
Date	November 2001	November 2001	December 2001	January 2002	February 2002.	February 2002
Lecturer	A Dr	B Dr	A PHN	C Dr	C Dr	D Dr
Subjects	A company worker	B city office worker	C public institution worker	D town office worker	D town office worker	E city office worker
Subjects (n).	48	33	48	36	122	133
Responders (n)	45	33	48	36	113	127
Valid responders (n)	45	29	45	31	107	127
Valid response rate (%)	100	87.9	93.8	86.1	94.7	100
Characteristics of valid responders						
Gender (male:female)	43:2	18:11	42:3	22:9	62:44	93:34
Age (years)	40.7 ± 11.8	44.1 ± 9.0	39.1 ± 9.7	40.0 ± 10.1	39.8 ± 9.6	39.9 ± 10.4
Contact (%)	37.8	69.0	46.7	67.7	55.1	59.8
Lecture (%)	28.9	27.6	44.4	54.8	15.0	19.7
Voluntary activity (%)	35.6	51.7	28.9	38.7	51.4	38.6
Contact program (%)	4.4	13.8	2.2	29.0	14.0	11.8

PHN, public health nurse.

Table 2. Changes in MIDUS

Research no.	Before mean ± SD	After mean ± SD	P[†]
1	21.1 ± 5.8	7.4 ± 5.9	0.000
2	15.3 ± 7.4	6.3 ± 6.0	0.000
3	19.2 ± 7.2	10.2 ± 6.7	0.000
4	14.5 ± 8.4	9.5 ± 6.3	0.000
5	18.8 ± 7.7	11.3 ± 8.3	0.000
6	19.2 ± 7.0	12.2 ± 8.2	0.000

MIDUS, Mental Illness and Disorder Understanding Scale.
[†]Wilcoxon test.

Table 3. Changes in Negative Attitudes Scale

Research no.	Before mean ± SD	After mean ± SD	P[†]
1	9.3 ± 3.1	7.2 ± 2.5	0.000
2	7.8 ± 3.4	6.3 ± 3.3	0.004
3	8.3 ± 3.0	6.5 ± 2.9	0.000
4	6.6 ± 3.1	6.6 ± 2.8	NS
5	8.3 ± 3.5	7.4 ± 3.8	0.001
6	8.6 ± 3.1	7.9 ± 3.3	0.015

[†]Wilcoxon test; NS, not significant.

Table 4. Changes in psychiatric treatment-seeking behavior scores

Research no.	Before mean ± SD	After mean ± SD	P[†]
1	2.3 ± 1.2	0.8 ± 0.9	0.000
2	2.1 ± 1.2	0.9 ± 1.0	0.000
3	2.7 ± 1.2	1.5 ± 1.1	0.000
4	2.0 ± 1.3	1.5 ± 1.3	0.032
5	2.2 ± 1.3	1.7 ± 1.1	0.000
6	2.3 ± 1.2	1.4 ± 1.1	0.000

[†]Wilcoxon test.

scores with respect to psychiatric treatment-seeking behavior. This behavior significantly improved in all research groups ($P = 0.000$–0.032).

Using the method reported by Paykel et al.,[8] we also compared the rate of agreement (the total rate of those who chose 'strongly agree' and 'tend to agree' from the options) with the items in MIDUS before and after the lecture (in the Tables, the items are classified into groups of factor structures assumed in our study). The results are shown in Table 5. In the Tables, the item

Table 5. Changes in the rate of agreement with the items of MIDUS before and after the lecture

Item		Research no.					
	% agree before/after $P^†$	1	2	3	4	5	6
Treatability of illness							
5. Mental illness requires early treatment		98/98 NS	100/100 NS	93/98 NS	100/97 NS	88/95 NS	91/92 NS
12. Mental illness is treatable		76/100 ***	83/97 NS	78/93 NS	90/87 NS	85/94 **	83/91 NS
15. Delayed treatment worsens the prognosis of mental illness		82/98 *	90/97 NS	76/91 NS	94/97 NS	79/82 NS	87/87 NS
10. Living environment has an influence on recovery from illness		98/84 NS	97/97 NS	98/93 NS	100/97 NS	93/93 NS	94/91 NS
14. Misunderstanding of mental illnesses makes it difficult for people with mental disorder to participate in society		87/89 NS	93/93 NS	91/89 NS	94/94 NS	87/84 NS	85/85 NS
7. Rehabilitation is effective in improving mental disorder		80/87 NS	83/86 NS	78/84 NS	81/81 NS	73/81 NS	69/68 NS
Efficacy of medication							
6. Treatment requires medication		11/89 ***	38/93 ***	13/58 ***	32/61 *	26/66 ***	23/63 ***
2. Medication improves brain function		24/100 ***	31/90 ***	27/82 ***	42/77 **	21/70 ***	24/73 ***
9. Medication is effective in improving symptoms		33/100 ***	59/97 **	44/87 ***	61/81 NS	53/86 ***	55/86 ***
13. Continuous administration of medication dose not lead to intoxication or addiction		20/82 ***	31/69 **	20/33 NS	29/39 NS	18/53 ***	17/50 ***
8. Mental illness is a brain disease		29/91 ***	48/79 *	31/67 **	32/68 *	33/76 ***	34/61 ***
Social recognition of illness							
1. Mental illnesses (depression, schizophrenia etc) are very common		44/93 ***	66/97 **	67/91 **	74/94 NS	53/83 ***	58/85 ***
11. Anybody can suffer from mental illness		84/96 NS	90/100 NS	93/100 NS	90/100 NS	85/92 NS	88/88 NS
4. Mental illness is a medical condition like other illnesses		33/91 ***	79/93 NS	47/82 **	58/90 **	48/74 ***	51/74 ***
3. People with mental disorders can live in the community, if they receive appropriate support		69/93 **	76/90 NS	62/89 **	84/87 NS	70/87 **	72/76 NS

MIDUS, Mental Illness and Disorder Understanding Scale.
†Fisher's exact test; NS, not significant; *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

number is equivalent to the question number. The rate of agreement with the items classified as 'treatability of illness' (items no. 5, 12, 15, 10, 14 and 7) was already high before the lecture (68.5% or higher). In particular, more than 92.5% of subjects agreed with item no.10 (regarding the effects of environment on recovery from illness) even before the lecture. Regarding the items classified under 'efficacy of medication' (items no. 6, 2, 9, 13 and 8), the rate of agreement before the lecture was only 11.1–61.3% across all groups but this rate increased significantly after the lecture. In particular, a significant increase was observed in all research groups for items no. 6, 2, and 8 ($P = 0.000$–0.041).

Concerning the items classified as 'social recognition of illness' (items no. 1, 11, 4 and 3), the agreement rate after the lecture exceeded 73% for all items. The pre-lecture agreement rate was also high (>84%) for item no. 11 ('anybody can suffer from mental illness') and no significant change was apparent in any group with regards to this item.

Table 6 shows the comparison of agreement rates (the percentage of people who chose 'agree' from the options) for the items of the Negative Attitudes Scale before and after the lecture (the questions are arranged in groups of positive and negative attitudes). Concerning responses to items in the form of positive expressions, the agreement rate before the lecture was already high (>75%) for item no.1 ('anybody can suffer from mental illness') in all the groups. The agreement rate remained low (the highest being 51.7%) even after the lecture for item no. 4 (ability of those with mental illness to participate in a social life). Regarding items in the form of negative expressions, the agreement rate for item no.2 ('it is better to stay in hospital away from hassle') increased in all groups and this increase was significant in groups 2 and 6 ($P < 0.05$).

Table 7 indicates changes in psychiatric treatment-seeking behavior. The agreement rate for this item was 35% or lower before the lecture in all groups and increased significantly after the lecture across all groups ($P = 0.000$–0.008) apart from group 4.

DISCUSSION

Owing to the recent recognition of the limitation of resources and subsequent rise in the need for a highly cost-effective service in the social welfare and health-care sectors, studies evaluating the effectiveness of diverse programs have been extensively performed.[14] Educational projects performed in an attempt to reduce stigma towards mental illness have been frequently evaluated in many countries. For example, Wolff *et al.* compared the attitudes of residents between an area where an educational campaign was

conducted and an area that did not receive such a campaign,[7] using scales including a 40-item inventory of Community Attitudes to the Mentally Ill[15] and a four-item knowledge scale.[16] They reported that the residents in the area where the campaign was conducted reported significantly less fear and exclusion. Paykel *et al.*, instead of using a standardized scale for evaluation, developed and used an original 25-item questionnaire enquiring about general recognition and attitudes toward mental illness, seeking treatment, and general practitioners (GPs).[8] They compared the agreement rates to items in this questionnaire before and after an educational campaign and found that attitudes became significantly more positive after the campaign.

Similarly, in the Japanese health-care field, the Ministry of Health, Labor and Welfare has prepared and distributed a health service evaluation manual to all health centers and local governments, requesting the design and development of optimally effective and efficient health programs and the subsequent strict scientific evaluation of all implemented health programs.[17] However, the performance of educational programs targeting local residents has not been evaluated in Japan.[9–11] Mino *et al.* described the development of a 1 h educational program given to medical students, assuming that a briefer program would be required in order to change attitudes among citizens.[11] During the program, the current conditions of mental health care in Japan (e.g. number of inpatients, long-term hospitalization, poor social support system) were described and the case of a person with schizophrenia living in the local community was presented without using complicated technical terms to emphasize the importance of establishing a support system. Mino *et al.* created an original questionnaire (31 items) regarding general recognition of attitudes toward illness and treatment, social distance, and human rights, rather than using standardized evaluation scales. Rates of agreement with each item before and after educational programs were subsequently compared. According to the results of the report, a 1 h lecture (educational program) was more than adequate to significantly improve the attitudes of participants towards people with mental illness, and also to indicate that requirements for developing a program for local residents should be established and evaluated.

The current study can be regarded as a pilot study to address the issues presented by Mino *et al.*[11] The study suggested that a lecture (educational program) lasting for approximately $1^1/_2$ h may have improved understanding, negative attitudes and treatment-seeking behavior of the public. However, in the present study, significant changes in negative attitude were noted in

Table 6. Changes in the rate of agreement with the items of Negative Attitudes Scale before and after the lecture

Item		Research no.					
	% agree before/after P†	1	2	3	4	5	6
Positive expression							
1. Anybody can suffer from mental illness in this drastically changing society		76/96 *	83/97 NS	78/89 NS	84/97 NS	80/87 NS	85/89 NS
4. Even those who have delusions and hallucinations can often live in the community without being hospitalized		24/36 NS	38/52 NS	27/44 NS	39/26 NS	28/37 NS	18/26 NS
6. People with mental illness behave in an abnormal way only when the condition of the illness is not good and they usually can live as a member of society		40/62 NS	62/66 NS	44/62 NS	61/74 NS	49/57 NS	45/54 NS
7. A person who has been admitted to a mental hospital could be a reliable friend		36/56 NS	62/79 NS	36/44 NS	65/61 NS	43/54 NS	39/43 NS
Negative expression							
2. Patients in mental hospitals are better off staying in hospital without any hassle rather than being exposed to the harsh realities of the outside world		11/27 NS	7/31 *	9/16 NS	3/13 NS	11/16 NS	7/18 *
3. The behavior of people with mental disorder is not understandable at all		27/13 NS	14/7 NS	22/7 NS	7/7 NS	20/14 NS	16/17 NS
5. It is shameful if others find out that I have a family member with mental illness		33/11 *	17/14 NS	24/11 NS	19/7 NS	18/10 NS	19/19 NS
8. Mental hospitals are needed to prevent mentally ill patients from committing violence and injuring others		29/18 NS	28/10 NS	22/7 NS	16/16 NS	30/29 NS	34/21 *
9. We cannot expect those with mental illness to control themselves to prevent relapse		24/20 NS	17/10 NS	18/7 NS	23/23 NS	13/17 NS	17/14 NS
10. I feel insecure when people with mental illness, singly or as a group, rent and live in an apartment		60/27 **	35/24 NS	47/24 *	26/10 NS	45/35 NS	49/32 **

†Fisher's exact test; NS, not significant; *$P < 0.05$; **$P < 0.01$.

Table 7. Changes in the rate of agreement with psychiatric treatment-seeking behavior before and after the lecture

Item	Research no.	% agree Before	% agree After	$P^{\dagger}$
If I experienced mental	1	24.4	80.0	0.000
distress (insomnia, poor	2	34.5	79.3	0.001
appetite, depression), I	3	13.3	51.1	0.000
would visit a psychiatric	4	32.3	54.8	NS
facility	5	23.4	41.1	0.008
	6	23.6	52.0	0.000

[†]Fisher's exact test; NS, not significant.

all groups apart from group 4. Because the rates of past attendance at educational and contact programs for subjects in group 4 were the highest among all research groups, the mean score for negative attitudes toward people with mental illness was already the lowest before the lecture and therefore the change was not significant statistically.

According to the change in the agreement rate for each item of MIDUS, it was suggested that although misunderstandings about medication were deep-rooted, they could be improved. Paykel *et al.* reported that psychiatric medication was regarded as addictive, with 74% of respondents regarding antidepressants as addictive and 84% regarding antipsychotics as addictive, indicating that anxiety and misunderstanding about drug dependency is also strong in the UK.[8] The results of the present study also suggested that the items classified as 'treatability of illness' and 'social recognition of illness' showed comparatively higher pre-lecture agreement rates. Paykel *et al.* also reported high agreement rates to items with this type of theme: 81% agreed that 'depression is a medical condition like other illnesses' and 97% agreed that 'anybody can suffer from depression'.[8] It was therefore suggested that such items were easily shared by the local community as a whole and could thus be regarded as a starting point for communication with residents in establishing local partnerships. In contrast, Mino *et al.* reported that the rate of agreement with the statement 'mental illness is a kind of disease like diabetes, hypertension and heart diseases' remained low even after the lecture (65.8%).[11] This may be because medical students were chosen as the subjects of evaluation and also because the concept and treatment (including medication) of disease were not sufficiently defined in their program.

The change in the agreement rate for items of the Negative Attitudes Scale indicates that the rate of agreement with the statement that 'patients in mental hospitals are better off staying in hospital without any hassle rather than being exposed to the harsh realities of the outside world' increased in all the groups, with significant increases in research groups 2 and 6 ($P < 0.05$). Because there was no explanation of problems associated with long-term hospitalization presented in the pamphlet used in our program, approval of long-term hospitalization may have been inadvertently encouraged. The contents of the pamphlet should therefore be revised and improved in the future to address this area. Although some improvement in positive attitude was generally observed in other items, the changes were not significant in most cases. Therefore, it appeared that our program had only a limited effect in improving the agreement rate for items on the Negative Attitudes Scale, and hence new programs involving speeches by those with mental illness themselves and high-quality partnership activities with those with mental disorders (e.g. recreation activities and collaborative activities at an equal level) should be considered.[18–20] Furthermore, because a 3-point rating system is used in this scale, the ability of the rating system to detect subtle changes in attitude may be limited.

A total of 80 subjects entered their opinions in the space reserved for this on the questionnaire. Their opinions were generally affirmative, stating comments such as 'I misunderstood mental illness. I now recognize that the illness is due to impairment of the brain and treatment using drugs is effective', 'My misunderstanding is cleared', 'I have changed my perspectives and images of mental illness', 'I didn't realize that medication could be effective', 'I also have the possibility of having the illness' and 'I feel satisfied to have clearly understood what mental illness is like'. Requests made by the subjects included 'I would like to know about the side-effects of the medication', 'I want to hear how to care for people around me with mental illness', 'I want to learn how to prevent mental illness', 'The lecture should be longer', 'Mental problems will be more important in the future. Such educational lectures should be continued as a series'. Based on these opinions, the authors will make an effort to improve the contents of the programs.

Attendance at such a lecture in itself can represent great progress and may induce alterations in attitudes toward mental illness. It is essential to develop a strategy to stimulate motivation for participation in such educational lectures by, for example, preparing a theme that is more familiar to the participants.

ACKNOWLEDGMENTS

REFERENCES

1. US Department of Health and Human Services. *Mental Health: A Report of the Surgeon General – Executive Summary.* Department of Health and Human Services, US Public Health Services, Rockville, MD, 1999.

2. World Health Organization. *Mental Health: New Understanding, New Hope*. World Health Organization, Geneva, 2001.

3. World Psychiatric Association. *Schizophrenia: Open the Doors Training Manual; Global Program Against Stigma and Discrimination Because of Schizophrenia.* World Psychiatric Association, New York, 2002.

4. World Psychiatric Association. Symposium; Global Program Against Stigma and Discrimination Because of Schizophrenia Part 1 & 2. In: *XIIth World Congress of Psychiatry* (CD-ROM). World Psychiatric Association, New York, 2002.

5. Sartorius N. Fighting schizophrenia and its stigma. A new World Psychiatric Association educational programme. *Br. J. Psychiatry* 1997; **170**: 297.

6. Sartorius N. Stigma: what can psychiatrists do about it? *Lancet* 1998; **352**: 1058–1059.

7. Wolff G, Pathare S, Craig T, Leff J. Public education for community care – A new approach. *Br. J. Psychiatry* 1996; **168**: 441–447.

8. Paykel ES, Hart D, Priest G. Changes in public attitudes to depression during the Defeat Depression Campaign. *Br. J. Psychiatry* 1998; **173**: 519–522.

9. Ishige N, Hayashi N. Effects of an educational course of mental health on nursing students′ attitudes toward the mentally disabled. *Jpn. Bull. Soc. Psychiatry* 2000; **9**: 11–21 (in Japanese).

10. Mino Y, Yasuda N, Kanazawa S, Inoue S. Effects of medical education on attitudes towards mental illness among medical students: a five-year follow-up study. *Acta Med. Okayama* 2000; **54**: 127–132.

11. Mino Y, Yasuda N, Tsuda T, Shimodera S. Effects of a one-hour educational program on medical students' attitudes to mental illness. *Psychiatry Clin. Neurosci.* 2001; **55**: 501–507.

12. Tanaka G, Inadomi H, Kikuchi Y, Ohta Y. Development of an evaluation scale for the 'Barrier-Free Mind' Project. In: *XIIth World Congress of Psychiatry* (CD-ROM). World Psychiatric Association, New York, 2002.

13. Zenkaren Health and Welfare Research Institute. *Seisin-shougaishakan no gennkyou 1997 [The Attitude Toward People with Mental Disorders 1997]*. Zenkaren, Tokyo, 1998 (in Japanese).

14. Rossi PH, Freeman HE, Lipsey MW. *Evaluation: A Systematic Approach*, 6th edn. Sage, California, 1999.

15. Taylor MS, Dear MJ. Scaling community attitudes toward the mentally ill. *Schizophr. Bull.* 1981; **7**: 225–240.

16. Wolff G, Pathare S, Craig T, Leff J. Community attitudes to mental illness. *Br. J. Psychiatry* 1996; **168**: 183–190.

17. Ministry of Health Labour and Welfare. *Hokenjigyou hyouka manyuaru [Health Program Evaluation Manual]*. Ministry of Health Labour and Welfare, Tokyo, 2002. http://www.mhlw.go.jp/topics/2002/03/tp0307-2a.html (in Japanese).

18. Brown R. *Prejudice: Its Social Psychology*. Blackwell, Oxford, 1995.

19. Warner R. Interventions in high schools. In: *XIIth World Congress of Psychiatry* (CD-ROM). World Psychiatric Association, New York, 2002.

20. Corrigan PW, River LP, Lundin RK *et al.* Three strategies for changing attributions about severe mental illness. *Schizophr. Bull.* 2001; **7**: 187–195.