SHORT COMMUNICATION

Lifetime prevalence of mental disorders and its relationship to suicidal ideation in a Japanese rural community with high suicide and alcohol consumption rates

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Abstract

Objective The World Mental Health Survey Japan was conducted to address the current status of mental disorders in Japan. Among the various regions covered by the survey were Tendo City and Kaminoyama City in Yamagata Prefecture. The suicide and alcohol consumption rates in Yamagata are higher than the Japanese national average. Many studies have reported that major depressive disorder (MDD), alcohol use disorders (AUDs), and suicidal ideation are related to suicide risk. The prevalence of MDD, AUDs, and suicidal ideation, as well as the association between suicidal ideation and mental disorders must be investigated in order to implement mental health and suicide prevention measures in our community; however, only a few studies have addressed this issue.

Methods The survey involved face-to-face interviews. The study population consisted of 1,684 adult residents, of which 770 (mean age 54.0 ± 17.4 years) who completed the interview process. Mental disorders were assessed using the World Mental Health version of the World Health Organization Composite International Diagnostic Interview.

Results Among the study population, lifetime prevalence of MDD was 4.4%, which was similar to values reported in previous studies in Japan. Prevalence of AUDs, however, was 10.2%, which was higher those reported previously. We observed a significant association between suicidal ideation and MDD [odds ratio (OR) 7.6], our results showed precisely the opposite association between AUDs and suicidal ideation (OR 0.5, not significant) compared to previous studies.

Conclusions Although prevalences of MDD and suicidal ideation were not high, this study revealed a high lifetime prevalence of AUDs and a negative association between suicidal ideation and AUDs.

Keywords Mental disorders · Suicide · Alcohol · Lifetime prevalence · Describe epidemiology

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Introduction

The World Health Organization World Mental Health Survey (WMH) was conducted in 28 countries with the aim of addressing the current status of mental disorders and mental health service use around the world. The Japanese portion of this survey (WMHJ; World Mental Health Japan) was conducted between 2004 and 2006 and involved more than 4,000 residents in Okayama, Nagasaki, Kagoshima, Tochigi, and Yamagata Prefectures and in Yokohama City as a representative sample of the Japanese population. In Yamagata Prefecture, this survey was

conducted specifically in Tendo City and Kaminoyama City. Although the WMHJ has reported its findings on the 12-month and lifetime prevalence of mental disorders [1, 2], mental health service use [3], and the association between suicidal ideation and mental disorders [4], the local prevalence rates in the surveyed regions have not been reported to date.

The number of suicides in Japan increased dramatically from 23,494 in 1997 to 31,755 in 1998 and has remained at a high level since then, with a similar trend observed in Yamagata Prefecture [5, 6]. The suicide rate in Yamagata (28.8 per 100,000 people) is higher than the national average (24.0 per 100,000 people) [6]. Suicide is a major public health concern in Japan, especially in this community. Moreover, alcohol consumption in Yamagata is higher than the national average, with annual sales of alcoholic beverages of 42.6 thousand yen per adult compared to the national average of 36.1 thousand yen per adult [7]. According to a national patient survey, the proportion of those receiving medical treatment for alcohol-related disorders tended to be high in Yamagata [8]. Many studies have reported that suicide ideation and mental disorders, particularly major depressive disorder (MDD) and alcohol use disorders (AUDs), are associated with suicide risk [9–12]. However, few data are available on these parameters for Yamagata. In order to implement effective mental health and suicide prevention measures, more information is required on the prevalence of MDD and AUDs. Accordingly, we analyzed the Yamagata survey data from the WMHJ with the aim of assessing the prevalence of suicide ideation and mental disorders, with a specific focus on MDD and AUDs, and the association between suicidal ideation and MDD or AUDs in this population.

Materials and methods

Survey population and participants

We chose two rural cities in Yamagata Prefecture for our survey, Tendo (population in 2005: 63,864) and Kaminoyama (population in 2005: 36,013) [13]. The proportion of elderly residents aged ≥65 years was 21.6% in Tendo and 28.6% in Kaminoyama. The average suicide rate of the two cities between 2004 and 2008 was 27.8 per 100,000 people [6]. The proportion of elderly residents and suicide rates in these cities did not differ significantly from the average of Yamagata Prefecture. We conducted the survey in Tendo City from November 2004 to March 2005 and in Kaminoyama City from October 2005 to February 2006. A total of 1,684 randomly selected residents (807 in Tendo and 877 in Kaminoyama) aged ≥20 years were surveyed.

For random sampling, a district was first randomly selected from the electoral districts list. Subsequently, systematic sampling from the selected electoral district (extraction ratio 25%) was repeated until the number of subjects reached the target number. As a result, we selected 26 electoral districts from the 53 districts in Tendo City and 23 from the 37 districts in Kaminoyama City. After selecting subjects, community volunteers first contacted subjects in their homes to explain the purpose of the survey and to recruit them into the survey. Interviews were conducted only after informed consent was obtained. This study was approved by the Committee for Ethics at Yamagata University Faculty of Medicine in September 2004.

Survey interviewers and instruments

The survey used the World Mental Health version of the World Health Organization Composite International Diagnostic Interview (WMH-CIDI), a fully structured psychiatric diagnostic interview [14]. All 36 interviewers were certified healthcare specialists, such as public health nurses. Prior to the survey, interviewers received 5 days of standardized, instrument-specific training from the official trainer (NI) and assistants who were previously trained to use the instrument. The training included didactic sessions on general interview skills and reviews of the instrument sections, mock interviews, and role-playing exercises. Trained interviewers carried out structured face-to-face interviews with those who agreed to participate in the survey using the standardized instrument. The length of the interview with each respondent was approximately 90 min.

The CIDI questionnaire is divided into two parts: Part I assesses all mood and anxiety disorders, with the exception of post-traumatic stress disorder (PTSD); Part II assesses risk factors, correlates, and additional disorders, such as PTSD and all substance use disorders. During Part I, a core diagnostic assessment was administered to all respondents, and their basic socio-demographic data were collected. Part II was then administered to all Part I respondents who met diagnostic criteria for a mental disorder and to a probability subsample of other respondents ($n = 344$). Part II respondents were weighted by the inverse of their probability of selection to adjust for the differential sampling of cases and non-cases. In addition, all samples were weighted to adjust for differential probabilities of selection and post-stratified to match population distributions on the cross-classification for sex and age (for details, see [1]).

Lifetime prevalence of WMH-CIDI/DSM disorders and suicidal ideation

This study used the Japanese version of the computer-assisted personal interview (CAPI) form of the WMH-CIDI,

a fully structured diagnostic interview that generates diagnoses based on criteria of the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV). We defined a mental disorder diagnosed by the WMH-CIDI interview as a WMH-CIDI/DSM disorder. The lifetime prevalence of WMH-CIDI/DSM disorders estimated in the survey were (1) mood disorders, including MDD, minor depressive disorder, bipolar I–II disorder, and dysthymia; (2) anxiety disorders, including panic disorder, agoraphobia without panic, social phobia, specific phobia, generalized anxiety disorder, and PTSD; (3) substance use disorders, including AUDs (alcohol abuse or dependence) and drug use disorders (drug abuse or dependence). Lifetime prevalence of WMH-CIDI/DSM disorders was determined based on those who had met the diagnostic criteria for each mental disorder by the time of the survey. Respondents who experienced suicidal ideation were defined as those who had "seriously thought about committing suicide" by the time of the survey.

Association between suicidal ideation and WMH-CIDI/DSM disorders

We performed logistic regression analysis to assess the association between suicidal ideation and WMH-CIDI/DSM disorders by the time of the survey. In our survey, we included cases where participants met the diagnostic criteria by developing a mental disorder after experiencing suicidal ideation.

Data analysis

Simple cross-tabulation was used to calculate the lifetime prevalence of WMH-CIDI/DSM disorders and suicidal ideation by sex and age. Our logistic regression analysis used suicidal ideation as the dependent variable and WMH-CIDI/DSM disorders, sex, and age as independent variables. Statistical significance was evaluated using two-sided, design-based tests with a 5% level of significance. All statistical analyses were performed using SPSS ver. 15.0J (Statistical Package for Social Science, Chicago, IL).

Results

Characteristics of respondents

We confirmed the validity and representativeness of the sample by using the chi-square test to compare differences in gender and age distributions between the sample and general populations in the two cities surveyed (data not shown). Subjects who had died, moved, or had been institutionalized were excluded. The interviews were

incomplete for 746 subjects who initially declined to participate or requested to stop the interview before completion, while 770 subjects completed the entire interview, resulting in a response rate of 50.8% (Table 1). The mean age of the respondents with complete interviews was 54.0 ± 17.4 (mean ± SD) years, and the proportion of males was 47.5% ($n = 366/770$; Table 2).

Lifetime prevalence of WMH-CIDI/DSM disorders and suicide ideation

The lifetime prevalence of mood disorders was 7.2%, of which MDD accounted for 4.4%; the lifetime prevalence of AUDs was 10.2%, but there were no drug use disorders. There was a significantly higher lifetime prevalence of MDD in females than in males (6.2 vs. 2.6%, $p = 0.03$), while the lifetime prevalence of AUDs was significantly higher in males than in females (15.4 vs. 4.9%, $p = 0.01$). The lifetime prevalence of suicidal ideation was 8.1%. Among all of the age groups evaluated, younger subjects (age range 20–34 years) had a higher lifetime prevalence of mood disorders and suicidal ideation, and middle-aged

Table 1 Survey details

Survey details	n	%
Total initial samples	1,684	100.0
Completed interview	770	45.7
Incomplete interview[a]	746	44.3
Initially declined to participate	740	43.9
Requested to stop the interview	6	0.8
Ineligible[b]	168	10.0
Response rate[c]	–	50.8

[a] Incomplete interviews included subjects who initially declined to participate or requested to stop the interview before completion

[b] Ineligible subjects include those who died before completing the interview, had moved, or had been institutionalized

[c] Response rate = (No. completed interviews)/(No. total initial sample − No. ineligible)

Table 2 Age and sex distributions of respondents

Age (years)	Male		Female		Total	
	n	%	n	%	n	%
20–34	56	15.3	77	19.1	133	17.3
35–49	76	20.8	100	24.8	176	22.9
50–64	110	30.1	106	26.2	216	28.1
65+	124	33.9	121	30.0	245	31.8
Total	366	100.0	404	100.0	770	100.0
Mean (±SD)	55.3 ± 17.0		52.8 ± 17.6		54.0 ± 17.4	

SD Standard deviation

Table 3 Lifetime prevalence of WMH-CIDI/DSM disorders and suicidal ideation

	Total		Sex						Age (years)									
			Male		Female		χ²	p value	20–34		35–49		50–64		65+		χ²	p value
	%	95% CI	%	95% CI	%	95% CI			%	95% CI	%	95% CI	%	95% CI	%	95% CI		
Mood disorders	7.2	5.4–9.4	4.9	2.9–8.2	9.4	6.8–12.9	4.69	0.03*	12.8	7.9–19.9	8.5	5.1–13.8	5.1	2.8–9.1	3.4	1.6–6.9	13.50	0.01*
Major depressive disorder	4.4	3.1–6.2	2.6	1.3–5.2	6.2	4.2–9.2	4.95	0.03*	7.9	4.3–14.0	4.0	2.0–8.1	4.1	2.1–7.7	2.3	0.9–5.6	6.28	0.12
Anxiety disorders[a]	7.5	5.5–10.1	7.6	4.9–11.7	7.4	4.9–11.2	0.01	0.93	6.1	3.0–12.1	9.6	5.3–16.6	8.3	4.8–14.1	5.8	3.0–10.8	1.20	0.60
Substance use disorders[a]	10.2	7.2–14.3	15.4	10.4–22.2	4.9	2.2–10.5	8.17	0.01*	7.8	3.6–15.8	10.4	5.2–19.5	15.4	8.7–26.0	6.1	2.6–13.7	4.98	0.21
Drug use disorders[a]	0.0	0.0–0.0	0.0	0.0–0.0	0.0	0.0–0.0	–	–	0.0	0.0–0.0	0.0	0.0–0.0	0.0	0.0–0.0	0.0	0.0–0.0	–	–
Alcohol use disorders[a]	10.2	7.2–14.3	15.4	10.4–22.2	4.9	2.2–10.5	7.78	0.01*	7.8	3.6–15.8	10.4	5.2–19.5	15.4	8.7–26.0	6.1	2.6–13.7	4.98	0.21
Alcohol abuse[a]	9.1	6.2–13.1	13.4	8.8–20.0	4.6	2.0–10.3	6.10	0.01*	5.2	2.0–13.0	8.1	3.6–17.1	15.4	8.7–26.0	6.1	2.6–13.7	6.81	0.11
Alcohol dependence[a]	1.1	0.5–2.5	2.0	0.8–4.8	0.2	0.0–1.7	5.96	0.02*	2.5	0.8–7.9	2.3	0.7–7.3	0.0	0.0–0.0	0.0	0.0–0.0	5.98	0.10
Any disorders[a]	23.2	18.9–28.0	26.4	20.1–34.0	19.8	14.7–26.2	2.12	0.15	21.7	14.2–31.6	26.1	17.5–36.9	30.4	21.3–41.3	13.2	8.0–21.0	8.64	0.03*
Suicidal ideation	8.1	6.3–10.5	6.4	3.88–8.96	8.8	6.04–11.6	1.54	0.21	12.9	7.9–20.5	6.4	3.7–10.9	8.3	5.3–12.9	5.6	3.1–9.9	7.21	0.09

CI confidence interval, WMH-CIDI/DSM World Mental Health version of the World Health Organization Composite International Diagnostic Interview/Diagnostic and Statistical Manual of Mental Disorders

* $p < 0.05$

[a] Part II sample

subjects (age range 50–64 years) had the highest lifetime prevalence of AUDs (Table 3).

Association between suicidal ideation and WMH-CIDI/DSM disorders

The percentage of respondents with mood disorders who experienced suicidal ideation was 30.6%. This increased to 38.2% when only participants with MDD were considered. Only 4.2% of participants with AUDs experienced suicidal ideation, the lowest percentage among all mental disorders. We observed a significant association between suicidal ideation and WMH-CIDI/DSM disorders, with an odds ratio (OR) of 5.9 (95% CI 2.8–12.3) for mood disorders and 7.6 (95% CI 3.4–17.1) for MDD. Anxiety disorders were also significantly associated with suicidal ideation (OR 2.9, 95% CI 1.2–6.6). In contrast to previous studies, we observed a negative association between AUDs and suicidal ideation, although this association was not significant (OR 0.5, 95% CI 0.1–2.1) (Table 4).

Discussion

The lifetime prevalence of MDD in this study (4.4%) was similar to that observed in previous studies in Japan, namely, 2.9% (Gifu City) [15] and 6.4% (WMHJ; Okayama, Nagasaki, Kagoshima, and Tochigi Prefectures) [2]. Moreover, lifetime prevalence of suicidal ideation (8.1%) was not considerably different from that observed in the WMHJ (10.4%) [2]. Although the suicide rate in Yamagata is higher than the national average, the lifetime prevalence of MDD and suicidal ideation was not high in these communities. However, our findings were consistent with others who found that the lifetime prevalence of mood disorders, MDD, and suicidal ideation in Japan and New Zealand was significantly higher in females and in the younger population [2, 16, 17]. Given the longer lifespan, the higher lifetime prevalence was not unexpected in the elderly population, but it was also high in the younger population for this study. These results seem to indicate that younger generations are more likely to develop mood disorders, MDD, and suicidal ideation. However, reporting on past events is particularly prone to recall bias, which may have yielded a distorted association between age and mood disorders, MDD, and suicidal ideation. In addition, the response rate was lower among the younger age groups (20–34 years: 41.7%; 35–49 years: 49.9%; 50–64 years: 53.1%; 65+ years: 56.1%). Future studies are required to validate our findings. Interestingly, the prevalence of AUDs observed in this study was higher than reported previously in Japan (Gifu City 7.6% [15]; WMHJ 2.9% [2]), possibly suggesting an association between alcohol

Table 4 Associations of suicidal ideation with lifetime WMH-CIDI/DSM disorders

WMH-CIDI/DSM disorders	Suicidal ideation (%)	95% CI	Odds ratio	*p* value	95% CI
Mood disorders					
(+)	30.6	19.3–44.9	5.9*	<0.01	2.8–12.3
(−)	6.4	4.7–8.7	1.0		
Major depressive disorder					
(+)	38.2	22.9–56.4	7.6*	<0.01	3.4–17.1
(−)	6.7	5.0–9.0	1.0		
Anxiety disorders[a]					
(+)	20.1	10.6–34.9	2.9*	0.01	1.2–6.6
(−)	8.2	6.0–11.3	1.0		
Alcohol use disorders[a]					
(+)	4.2	1.0–16.2	0.5	0.31	0.1–2.1
(−)	9.7	7.2–12.9	1.0		
Any disorders[a]					
(+)	16.2	10.6–24.1	2.7*	<0.01	1.4–5.1
(−)	7.0	4.8–10.2	1.0		

* Odds ratio significant at the 0.05 level, two-sided test

Results are based on logistic regression analyses (adjusted for sex and age)

[a] Part II sample

consumption and AUD prevalence in this community (annual sales of alcoholic beverages: Gifu City, 32.0 thousand yen; national average, 36.1 thousand yen; Spearman's $r = 0.50$, not significant) [7].

Our findings on the association of suicidal ideation with mood and anxiety disorders also agreed with the results of previous studies conducted with similar methodology as that of the WMH survey in Japan [4], China [18], and Ukraine [19]. Although there was an association between suicidal ideation and AUDs in the Sino-Japanese survey [4, 18], and with high alcohol consumption in the Ukraine survey [19], results to the contrary were obtained in our study. We speculate that the reason for this lack of an association between suicidal ideation and AUDs, which has been described in these other studies [4, 18, 19], are the strong social and community networks that support those who experience AUDs, including family members, community social workers, and alcohol support groups. Although the frequency of aggressive behaviors related to alcoholism might be the same in this area as in other areas, people with AUDs in these communities suggest that they do not experience suicidal ideation because of this well-constructed social network. As a result, even though the prevalence of AUDs was high, the association between suicidal ideation and AUDs was opposite to that of previous studies.

It should be noted that the low response rate (50.8%) may have skewed the findings of our study. In particular, the prevalence of mental disorders may be underestimated, since people who have experienced any mental disorder may have been less willing to participate in the survey. In addition, several important mental disorders, such as schizophrenia and personality disorders, were not assessed

in the WMH surveys because the interview would have been difficult due to the stigma associated with these disorders. Previous validation studies have shown that disorders such as psychotic disorders are overestimated in lay-administered interviews such as the CIDI [20]. An additional limitation is that the study was a descriptive epidemiological study, and we were therefore unable to clarify the causal relationship between mental disorders and suicide ideation in community residents.

Despite its limitations, this study revealed a high lifetime prevalence of AUDs and the opposite association between suicidal ideation and AUDs compared with previous studies. While the results of our study confirm an association between suicidal ideation and MDD, some suicide prevention programs and measures specifically aimed at reducing depression have already been implemented for community residents in Japan [21–24]. Therefore, our finding suggests that depression intervention can be an effective approach for decreasing suicide in our communities. Although there was no association between suicidal ideation and AUDs, alcoholism treatment measures would still be valuable intervention because of the high prevalence of AUDs in Japanese communities.

This study provides basic data on the lifetime prevalence of mental disorders and the association between suicidal ideation and mental disorders, which will undoubtedly contribute to increasing public awareness of the current mental health situation.

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