

Suicidal behavior among homeless people in Japan

Tsuyoshi Okamura · Kae Ito · Suimei Morikawa ·
Shuichi Awata

Received: 20 June 2013 / Accepted: 28 October 2013 / Published online: 9 November 2013
© Springer-Verlag Berlin Heidelberg 2013

Abstract

Purpose The purpose of this study is to investigate the frequency and correlates of suicidal behavior among homeless people in Japan.

Methods A face-to-face survey was conducted in two districts of Tokyo, Japan, with 423 subjects who resided on streets and riversides and in urban parks and stations (street homeless) or who were residents of shelters, cheap hotels, or welfare homes for homeless people (sheltered homeless).

Results When questioned about suicidal ideation in the previous 2 weeks, 51 subjects (12.2 % of valid responses) had a recurring wish to die, 29 (6.9 %) had frequent thoughts of suicide, and 22 (5.3 %) had made suicide plans. In addition, 11 (2.9 %) subjects had attempted suicide in the previous 2 weeks and 74 (17.7 %) reported that they had ever attempted suicide. In univariate logistic regression analyses, street homelessness, lack of perceived emotional social support, poor subjective health perception, visual impairment, pain, insomnia, poor mental well-being, and

current depression were significantly associated with recurrent thoughts of suicide in the previous 2 weeks. Among these, current depression had the greatest significance. In multivariate logistic regression analyses after controlling for depression, street homelessness and lack of perceived emotional social support were significantly associated with recurrent thoughts of suicide in the previous 2 weeks.

Conclusion Comprehensive interventions including housing and social support as well as mental health services might be crucial as effective strategies for suicide prevention among homeless people.

Keywords Suicide · Homelessness · Social support · Housing · Depression

Introduction

During the financial crisis from 1997 to 1998, which resulted from the prolonged recession after the economic bubble burst [1], the annual number of suicides in Japan increased from 24,391 (in 1997) to 32,863 (35 % increase). Since then, the number has remained over 30,000 per year, which means that more than 80 persons commit suicide per day in Japan [2]. Compared to other countries, the suicide rate in Japan is high, with 24.4 per 100,000 people committing suicide in 2010 [3], more than twice the rate in the USA (11.0 per 100,000) [4].

A previous study [5] reported a correlation between the suicide rate among Japanese and economic difficulties, including suffering from unemployment in the male population. According to a survey [6], conducted by the Ministry of Health, Labor, and Welfare, the suicide rate among welfare recipients is higher than in the general

T. Okamura (✉) · K. Ito · S. Awata
Tokyo Metropolitan Institute of Gerontology, 35-2 Sakae-cho,
Itabashi-ku, Tokyo, Japan
e-mail: jacksonville1977@hotmail.com

T. Okamura
Department of Neuropsychiatry, Graduate School of Medicine,
University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo, Japan

K. Ito
Department of Geriatrics and Vascular Medicine, Tokyo
Medical and Dental University Graduate School, 45-5-1
Yushima, Bunkyo-ku, Tokyo, Japan

S. Morikawa
Yowa Hospital, 1-17-2 Ooizumi-cho, Nerima-ku, Tokyo, Japan

population (55.7 vs. 24.9 per 100,000). It is also reported that those who suffer from mental illness constitute a high percentage of completed suicides among welfare recipients. The authors of the report showed that mental illness is associated with suicide among poor people, but a comprehensive analysis of factors associated with suicide in this population needs to be done.

Some comprehensive investigations have studied the association of suicidal behavior with homelessness. Schutt et al. [7] reported that psychological distress and perceived social support have a positive and a negative effect, respectively, on the number of suicidal thoughts in the previous month among the sheltered homeless. Eynan et al. [8] reported that a psychiatric diagnosis was associated with suicidal ideation after controlling for covariates among the homeless. Schinka et al. [9], who studied 1,011 homeless veterans, found that suicidal behavior correlated with histories of psychiatric disorders and substance abuse. Desai et al. [10] conducted a large-scale, multicenter survey of homeless people with mental illness and reported that the prevalence of lifetime suicidal ideation and attempts was very high (66.2 and 51.3 % among the 7,224 participants, respectively) in an intensive case management program. They also reported that one vulnerable group that has not been extensively studied with regard to suicide risk is homeless people.

To our knowledge, there is only one study of suicidal behavior among homeless people in Japan. According to Morikawa et al. [11], who used the mini international neuropsychiatric interview classification (MINI), 55.7 % of the street homeless people in one district of Tokyo answered “yes” to one or more of the six questions about suicide. The six questions asked whether people: (1) had a wish to die, (2) had a wish to self-injure, (3) had suicidal thoughts, (4) had a suicide plan, (5) had made a suicide attempt during the past 30 days, or (6) had ever attempted suicide during their lifetime. According to the MINI, a person who answers yes to any of these questions is considered a suicide risk. Morikawa et al. also found that 31.6 % of the participants had attempted suicide during their lifetime. However, factors associated with suicidal behavior were not investigated in their study.

When comparing the results of the homeless surveys conducted in different countries, variations in the definition of homelessness should be taken into account. According to the US Department of Housing and Urban Development’s 2010 Annual Homeless Assessment Report, there are 649,917 homeless people (207.31 per 100,000, calculated using the latest population census) in the United States [12]. In contrast, in 2012, there were only 9,576 homeless people (7.48 per 100,000) in Japan according to a nationwide examination conducted by the Ministry of Health, Labor, and Welfare [13]. This discrepancy mainly

comes from the fact that the official Japanese definition of “homeless” only includes “street homelessness”, i.e., living on streets and riversides and in urban parks and stations, as defined in the Japanese Act on Special Measures concerning Assistance in Self-support of Homeless [14]. Homelessness in our study was based on the more universal definition from the US McKinney–Vento Act of 1987 federal legislation [15], i.e., a homeless person is an individual who lacks a fixed residence or who has a temporary nighttime residence, such as a shelter, institution, or place that is not designed for living.

Suicidal ideation is a well-established and powerful predictor of suicide attempt [16, 17]. The aim of this study was to investigate the frequency of suicidal behavior and correlates of suicidal ideation among homeless people in Japan.

Methods

Study population

A face-to-face survey was conducted in two districts of Tokyo targeting two social groups from December, 2010 to February, 2011. One consisted mainly of homeless people who resided on streets or riversides or in urban parks or stations (street homelessness) and the other mainly consisted of residents of shelters, cheap hotels, and welfare homes for homeless people (sheltered homelessness). The housing status of these two groups is consistent with the universal definition of homelessness as defined in the McKinney–Vento Act. The survey was conducted by the staff of two nonprofit organizations that help homeless people; all of those who received help during the study period from these organizations were the potential participants and those who refused to answer the questionnaires were excluded from the study.

The study protocol was approved by the Ethics Committee of the Tokyo Metropolitan Institute of Gerontology. Written informed consent was obtained from all participants prior to the investigation.

Measures

Suicidal behavior

Recent suicidal behavior was assessed by the responses (“yes” or “no”) to the following four questions: “In the past 2 weeks, have you repetitively wished you were dead?” “In the past 2 weeks, have you repetitively thought of suicide?” “In the past 2 weeks, have you made plans to commit suicide?” and “In the past 2 weeks, have you attempted suicide?” In addition, a history of lifetime

suicide attempts was assessed: “Have you ever attempted suicide in your lifetime?”

Sociodemographic variables

Sociodemographic variables including gender, age, educational level, marital status, employment, and average income per month were assessed. Certifications of public support in the areas of (1) long-term care need, (2) physical disability, (3) mental disability except intellectual disability, and (4) intellectual disability were also assessed.

Perceived emotional social support was evaluated based on the response (“yes” or “no”) to the following questions: “Do you have someone with whom you can consult when you are in trouble?” (PSS1) and “Do you have someone to whom you can talk when your physical condition is not good?” (PSS2). Perceived instrumental social support was evaluated with: “Do you have someone who can take care of you when you are ill in bed?” (PSS3) and “Do you have someone who can take you to the hospital when you do not feel well?” (PSS4). They were adapted from a previous study by Muraoka et al. [18] to investigate social support in older adults in a rural community. Although all four items were reported to have an association with current depression [19], PSS1 and PSS4 were associated with a risk of depressive status [20] and PSS4 was found to be associated with suicidal ideation [21].

Physical health-related variables

Physical health-related variables including subjective health perception and self-reported history of physical illness, visual impairment, hearing impairment, gait disturbance, and pain were also assessed. The subjective health perception was determined based on the subject’s answer to the question: “How would you describe your overall health at the moment?” Subjects were given five possible responses: 1 (extremely good), 2 (very good), 3 (good), 4 (not so good), and 5 (bad). Those who answered four or five were considered to have poor subjective health perception. Self-reported history of physical illness was evaluated on the basis of response (“yes” or “no”) to questions concerning a history of 16 medical conditions (stroke, heart disease, hypertension, renal disease, diabetes mellitus, hyperlipidemia, liver disease, cholelithiasis or cholecystitis, gastric or duodenal ulcer, tuberculosis or pleuritis, pneumonia, asthma, cancer, arthritis, osteoporosis, and backache). Visual and hearing impairment were assessed on the basis of the subject’s response (“yes” or “no”) to the following questions: “Do you have any trouble seeing?” and “Do you have any trouble hearing?”

Gait disturbance was determined based on the subject’s answers to the question: “How far can you walk?” with

possible answers of: “can walk without difficulty”, “can walk more than 2 km, but must refrain from working or will be ill in bed the next day”, “cannot walk more than 2 km”, “cannot walk more than 1 km”, and “cannot walk at all.” A subject who answered “can walk without difficulty” was considered to have no gait disturbance.

Presence of pain was determined based on the subject’s answers to the question: “Have you had any pain in the past month?” with possible answers of “no pain”, “very mild pain”, “mild pain”, “moderate pain”, “severe pain”, and “very severe pain.” A subject who answered moderate to very severe pain was considered to have pain.

Mental-health-related variables

The questionnaire also included mental-health-related variables such as self-reported history of mental illness, mental well-being, current depression, and cognitive function. Self-reported history of mental illness was evaluated on the basis of response (“yes” or “no”) to questions concerning a history of depressive disorder, schizophrenia, alcoholism, anxiety disorder, insomnia, and dementia.

As to mental well-being, the Japanese version of the WHO-Five Well-Being Index (WHO-5-J) was used. It is a short, positively worded instrument designed to assess the level of mental well-being over a 2-week period. It was conceptualized as a unidimensional measure that contains five positively worded items: “I have felt cheerful and in good spirits”; “I have felt calm and relaxed”; “I have felt active and vigorous”; “I woke up feeling fresh and rested”; and “My daily life has been filled with things that interest me.” The internal and external validity of the WHO-5-J has been established in elderly Japanese community residents [22]. The standard cut-off criterion was used, i.e., those who scored <13 were regarded as having poor mental well-being.

Current depression was assessed by a two-question case-finding instrument. The US Preventive Services Task Force [23] states that asking two simple questions about depressive mood (“Over the past 2 weeks, have you felt down, depressed, or hopeless?”) and anhedonia (“Over the past 2 weeks, have you felt little interest or pleasure in doing things?”) may be as effective as using longer instruments. According to Arroll et al. [24], these two screening questions can detect most cases of depression in general practice.

As the mean age of the subjects was predicted to be rather high, we included questions that assess cognitive functions, i.e., orientation, calculation, and memory. We asked five questions about orientation to time (year, season, date, day, and month) and a question about the ability to make calculations (count backward from 100 by sevens five times). As for memory function, the subject was

Table 1 Sociodemographic, physical health-related, and mental health-related characteristics of the study participants

Variables	Number of case/ number of respondent	Proportion of case (%)
Sociodemographic variables		
Educational level (without high school graduates degree)	243/418	58.1
Not married	396/414	95.7
Not employed	311/420	74.0
Low income (below welfare categories)	218/357	61.1
Street homelessness (those who resided on streets and riversides or in urban parks and stations)	86/423	20.3
Perceived emotional social support		
No one to whom you can talk when you are in trouble	179/421	42.5
No one to whom you can talk when your physical condition is not good	156/421	37.1
Perceived instrumental social support		
No one who can take care of you when you are ill in bed	284/417	68.1
No one who can take you to the hospital when you do not feel well	223/417	53.5
Certification of public support		
Certification of long-term care need	115/418	27.5
Certification of physical disability	62/419	14.8
Certification of mental disability (except intellectual disability)	31/419	7.4
Certification of intellectual disability	6/419	1.4
Physical health-related variables		
Poor subjective health perception	163/413	39.5
Visual impairment	166/420	39.5
Hearing impairment	90/423	21.3
Gait disturbance	163/422	38.6
Pain	124/419	29.6
Mental health-related variables		
History of mental illness		
Depressive disorder	20/346	5.8
Schizophrenia	28/346	8.1
Alcoholism	19/346	5.5
Anxiety disorder	12/346	3.5
Insomnia	42/346	12.1
Dementia	28/346	8.1
(Have one or more of six mental illness above)	108/346	31.2
Poor mental well-being	226/396	57.1

Table 1 continued

Variables	Number of case/ number of respondent	Proportion of case (%)
Current depression (two-question instrument)	119/412	28.9
Poor orientation to time (one or more mistakes)	77/307	25.1
Poor calculation (one or more mistakes)	195/343	56.9
Poor memory function (one or more mistakes)	152/311	48.9
Subjective memory impairment	97/420	23.1

presented with three words to memorize and was asked to recall as many of the words as possible after an interference task (calculation). We also assessed subjective memory impairment based on the response (“yes” or “no”) to the following question: “Do you feel you have had more memory problems in the past 6 months?”

Statistical analysis

Statistical analyses were performed using the SPSS software version 20 (IBM® SPSS®). Univariate logistic regression analyses were performed to investigate correlates of suicidal behavior with variables described above used as explanatory factors. In order to explore the influence independent of depression, multivariate logistic regression analyses were performed after controlling for current depression. A *p* value <0.05 was regarded as statistically significant.

Results

Characteristics of the study participants

Characteristics of the study participants are shown in Table 1. Out of a total of 423 subjects, 392 were men and 31 women. The mean age (\pm standard deviation) was 60.6 (\pm 11.9) years. Of the total number of subjects, 86 (20.3 % of valid responses) reported living on the streets and riversides or in urban parks or stations (street homelessness). On the other hand, 337 subjects lived in shelters, cheap hotels, and welfare homes for homeless people.

Frequency of suicidal behavior

As for suicidal ideation in the previous 2 weeks, 51 subjects (12.2 % of valid responses) had a recurrent wish to

Table 2 Suicidal behavior among the homeless people

Items	Number of 'yes's/number of respondent	Proportion of 'yes's (%)
Recent suicidal ideation and attempt		
Have you repetitively wished you were dead in the past 2 weeks?	51/419	12.2
Have you repetitively thought of suicide in the past 2 weeks?	29/419	6.9
Have you made plans of suicide in the past 2 weeks?	22/418	5.3
Have you attempted suicide in the past 2 weeks?	11/411	2.9
Lifetime suicidal attempt		
Have you ever attempted suicide in your lifetime?	74/418	17.7

die, 29 (6.9 %) had recurrent thoughts of suicide, and 22 (5.3 %) made plans to commit suicide. As for suicide attempts, 11 (2.9 %) subjects had attempted suicide in the previous 2 weeks and 74 (17.7 %) reported that they had ever attempted suicide (Table 2).

Factors associated with suicidal behavior

The results of univariate logistic regression analyses are shown in Table 3. In these analyses, recent suicidal ideation (recurrent thoughts of suicide in the previous 2 weeks) was used as a dependent variable. Statistically significant variables were street homelessness (OR, 3.01; 95 % CI, 1.38–6.58), lack of perceived emotional social support (“no one to whom you can talk when you are in trouble”; OR, 3.09; 95 % CI, 1.36–7.00) (“no one to whom you can talk when your physical condition is not good”; OR, 2.40; 95 % CI, 1.10–5.21), poor subjective health perception (OR, 3.22; 95 % CI, 1.46–7.12), visual impairment (OR, 2.70; 95 % CI, 1.24–5.88), pain (OR, 3.21; 95 % CI, 1.49–6.90), insomnia (OR, 3.16; 95 % CI, 1.23–8.09), poor mental well-being (OR, 5.01; 95 % CI, 1.70–14.71), and current depression (OR, 8.81; 95 % CI, 3.64–21.38). Current depression showed the strongest association with recent suicidal ideation. Lack of perceived emotional social support, but not lack of perceived instrumental social support, was associated with recent suicidal ideation.

In multivariate logistic regression analyses after controlling for depression, street homelessness (OR, 2.64; 95 % CI, 1.15–6.06) and lack of perceived emotional social support (“no one to whom you can talk when you are in trouble”; OR, 2.55; 95 % CI, 1.09–5.95) were significantly associated with recent suicidal ideation.

Discussion

The present findings demonstrate that 17.7 % of the participants attempted suicide during their lifetime, which is substantially higher than the rate for the general population. According to a survey conducted as part of the WHO World Mental Health Survey Initiative, the lifetime prevalence estimates of suicidal ideation, plans, and attempts in Japan were 10.9, 2.1, and 1.9 %, respectively [25]. In addition, 2.9 % of our sample reported a suicidal attempt in the previous 2 weeks. This result is consistent with previous research reporting the 30-day prevalence of suicidal attempt was 3.5 % for older homeless individuals [10], 3.4 % for veterans seeking treatment of substance abuse and psychiatric disorders [26], and 2.7 % for older homeless veterans who participated in a transition housing program [9].

The present findings also demonstrate that poor mental health status, especially current depression, is strongly associated with recent suicidal behavior. Our findings are supported by many previous studies in various populations [9, 27–29]. However, the present study also indicated that street homelessness and lack of perceived emotional social support remained significant after controlling for current depression.

To combat suicide, the Japanese government passed the Basic Act for Suicide Prevention in 2006 and established the General Principles for Suicide Prevention Policy (GPSP) in 2007. The GPSP has nine immediate objectives: (1) to promote research into suicide and suicide-related issues; (2) to deepen people’s understanding of factors related to suicide prevention; (3) to secure and train appropriate human resources; (4) to promote mental health; (5) to develop mental health services; (6) to make efforts to prevent suicide by social means; (7) to provide support for survivors of suicide attempts; (8) to lend support to the survivors of suicide; and (9) to support the activities of non-governmental organizations. The GPSP was fully revised in 2012 and the sixth objective of the revised GPSP (making efforts to prevent suicide by social means), now refers to the importance of supporting poor and homeless people to prevent suicide by social means.

For developing effective strategies for suicide prevention among homeless people, merely targeting depression and providing mental health services will be insufficient. Factors associated with psychological distress among homeless people are so complex that it is impossible to resolve them only in the context of mental health. Gilberg et al. [30] reported that homeless people had greater psychological distress than the general population and that their distress was associated with unemployment, smoking and alcohol, poor physical health, fewer social supports, and perceived barriers to obtaining needed medical care.

Table 3 Factors associated with recent suicidal ideation

Independent variables	Recent suicidal ideation/valid response	Univariate analysis		Multivariate analysis	
		Odds ratio	95 % CI	Odds ratio	95 % CI
Sociodemographic variables					
Gender					
Female	2/31	1			
Male	38/388	1.08	0.25–4.79		
Educational level					
High	14/172	1			
Low (without high school graduates degree)	15/242	0.75	0.35–1.59		
Marital status					
Married	3/18	1			
Not married	25/393	0.34	0.09–1.25		
Employment					
Employed	9/109	1			
Not employed	20/307	0.77	0.34–1.76		
Income					
Above welfare (>100,000 yen)	7/137	1			
Below welfare	17/218	1.57	0.63–3.89		
Housing status					
Shelters, welfare hotels and homes for homeless people	17/333	1		1	
On streets and riversides or in urban parks and stations (Street homeless)	12/86	3.01	1.38–6.58**	2.64	1.15–6.06*
Perceived emotional social support					
Someone to whom you can talk when you are in trouble					
Present	9/240	1		1	
Absent	19/177	3.09	1.36–7.00**	2.55	1.09–5.95*
Someone to whom you can talk when your physical condition is not good					
Present	12/262	1		1	
Absent	16/155	2.40	1.10–5.21**	1.74	0.77–3.92
Perceived instrumental social support					
Someone who can take care of you when you are ill in bed					
Present	7/124	1			
Absent	22/260	1.50	0.62–3.60		
Someone who can take you to the hospital when you do not feel well					
Present	13/191	1			
Absent	16/222	1.06	0.50–2.27		
Certification of public support					
Certification of long-term care need					
Not certified	25/302	1			
Certified	4/114	0.40	0.14–1.18		
Certification of physical disability					
Not certified	24/354	1			
Certified	5/62	1.21	0.44–3.29		
Certification of mental disability (except intellectual disability)					
Not certified	26/385	1			
Certified	3/31	1.48	0.42–5.19		
Certification of intellectual disability					
Not certified	28/410	1			

Table 3 continued

Independent variables	Recent suicidal ideation/valid response	Univariate analysis		Multivariate analysis	
		Odds ratio	95 % CI	Odds ratio	95 % CI
Certified	1/6	2.73	0.31–24.16		
Physical health-related variables					
Subjective health perception					
Good	10/249	1		1	
Poor	19/160	3.22	1.46–7.12**	2.02	0.87–4.69
Visual impairment					
Absent	11/252	1		1	
Present	18/164	2.70	1.24–5.88*	1.79	0.79–4.06
Hearing impairment					
Absent	25/330	1			
Present	4/89	0.57	0.19–1.70		
Gait disturbance					
Absent	13/256	1			
Present	16/162	2.05	0.96–4.38		
Pain					
Absent	13/292	1		1	
Present	16/123	3.21	1.49–6.90*	2.16	0.96–4.87
Mental health-related variables					
History of mental illness					
Depressive disorder					
Absent	22/324	1			
Present	3/20	2.42	0.66–8.90		
Schizophrenia					
Absent	22/316	1			
Present	3/28	1.60	0.45–5.73		
Alcoholism					
Absent	23/325	1			
Present	2/19	1.55	0.34–7.10		
Anxiety disorder					
Absent	24/322	1			
Present	1/12	1.17	0.14–9.42		
Insomnia					
Absent	18/302	1		1	
Present	7/42	3.16	1.23–8.09*	2.46	0.89–6.79
Dementia					
Absent	25/316				
Present	0/28				
Mental well-being					
Good	4/170	1		1	
Poor	24/223	5.01	1.70–14.71**	2.37	0.74–7.57
Current depression (two-question instrument)					
Negative	7/292	1			
Positive	21/118	8.81	3.64–21.38***		
Orientation to time					
Good	13/229	1			
Impaired	9/76	2.23	0.91–5.45		

Table 3 continued

Independent variables	Recent suicidal ideation/valid response	Univariate analysis		Multivariate analysis	
		Odds ratio	95 % CI	Odds ratio	95 % CI
Calculation					
Good	13/147	1			
Impaired	13/194	0.74	0.33–1.65		
Memory function					
Good	16/158	1			
One or more mistakes	8/152	0.49	0.21–1.19		
Subjective memory impairment					
Absent	19/322	1			
Present	10/94	1.90	0.85–4.24		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

They insisted that an effective strategy should include a broad-based health services package provided in an accessible service delivery setting. Targeting depression and providing mental health services might be effective only when it is provided in the context of a broad-based health services package.

According to the WHO's pyramid model for mental health [31], primary care for mental health must be supported by other levels of care, such as informal community-care services. Japan is in the process of reforming its mental health services from hospital-based mental health services to community-based mental health services [32], but changes have been slower than expected. A decline in hospital beds has been observed since 1994, but the total number of psychiatric care beds is still 2.7 per 1,000 people in Japan, compared with 0.3 beds per 1,000 people in the USA [33]. The development of community service program to prevent suicide among the homeless will contribute to the general reform process because it will provide support to the people who face the most difficult situations in our society.

Our results show that perceived emotional social support is a significant protective factor for recent suicidal ideation. Our results are consistent with those of Hwang et al. [34] showing that lack of perceived emotional social but not instrumental support was associated with poor mental health status among homeless people. Thus, being able to rely on a person who stands by one's side might have special importance for protection from suicidal behavior in homeless individuals.

However, it should also be noted that one of the outstanding features of our study population is social isolation and low accessibility to medical services. More than half of the study population reported that there was no one who could take care of them when they were ill in bed and no one who could take them to the hospital when they did not

feel well. These two items are included as measurements of perceived instrumental social support and directly relate to accessibility to medical services. Low accessibility might be more likely to result in attempted or completed suicide because an individual's mental and physical health may be more likely to be ignored and untreated. To avoid such circumstances, strengthening the social ties in the community might be crucial. Offering a relaxed setting, for example, a welfare café, where people can share their fears and concerns about homelessness and receive help and support from professionals may reduce the barriers to medical services and, moreover, encourage the integration of homeless individuals into a social network.

The present study also indicates that housing assistance, such as a shelter, might be a protective factor against suicidal behavior among street homeless. Glisson et al. [35] reported that a dormitory-style homeless shelter program with a comprehensive set of social services was successful in helping people find permanent housing within the first year after leaving the shelter. Wolf et al. [36] compared the subjective quality of life among three groups (homeless people who remained homeless, those who moved to dependent housing, and those who moved to independent housing) and they pointed out the significance of being independently housed to good quality of life. Although housing assistance may be crucial to preventing suicide among the street homeless, helping the homeless should start with providing a safe place with comprehensive services including social support and mental health services, and then should focus on helping them acquire independent housing.

This study had several limitations. First, our sample population may not have adequately represented the homeless people in Japan because this survey was limited to only two districts of Tokyo. Additionally, the participants involved in this study were those who were willing to

answer the questionnaire. Homeless people who did not respond to our questionnaire might have been more likely to have mental health problems and be isolated. Thus, in the present study, the frequency of suicidal behavior could have in fact been underestimated and the issue of suicidal behavior might be more serious than estimated by this study among homeless people in Japan. Second, we could not confirm a strong relationship between psychiatric diagnosis and suicidal behavior as previously reported because the present survey was based only on self-reported information. Psychiatric diagnostic interviews were not conducted because of difficulty with study design. However, the present findings indicate that brief screening tools such as the two-question assessment for current depressive episode or the WHO-5 for mental well-being could be effective for detection of psychological distress relating to suicidal ideation among homeless people. Third, a cross-sectional design has inherent limitations in determining a causal relationship. However, from an ethical point of view, a prospective longitudinal observational study to determine risk factors for suicidal behavior in such a high-risk population would not be realistic. From a practical point of view, prospective intervention studies are urgently needed to explore effective strategies for suicide prevention among the homeless at risk for suicide.

Conclusion

Street homelessness, lack of perceived emotional social support, and current depression were significantly associated with recent suicidal ideation among homeless people in Japan.

Comprehensive interventions providing housing assistance, social support, and mental health services might be crucial as effective strategies to prevent homeless people from committing suicide.

Acknowledgments We are deeply grateful to the staff of these two nonprofit organizations, TENOHASI and Hurusatonokai, for their extensive cooperation. This study was supported, in part, by Grant-in-Aid for Scientific Research from the Japanese Ministry of Health, Welfare, and Labor.

Conflict of interest The authors report no conflicts of interest.

References

- Chen J, Choi YC, Mori K, Sawada Y, Sugano S (2012) Recession, unemployment, and suicide in Japan. *Jpn Labor Rev* 9:75–92
- Cabinet Office (2012) White paper on suicide prevention in Japan. <http://www8.cao.go.jp/jisatsutaisaku/whitepaper/en/w-2012/pdf/chap1-1.pdf>. Accessed 19 June 2013
- World Health Organization (2012) Suicide prevention (SUPRE). Suicide statistics. Country reports and charts available. http://www.who.int/mental_health/media/japa.pdf. Accessed 18 Sept 2012
- World Health Organization (2012) Suicide prevention (SUPRE). Suicide statistics. Country reports and charts available. http://www.who.int/mental_health/media/unitstates.pdf. Accessed 18 Sept 2012
- Inoue K, Tani H, Fukunaga T, Abe S, Nishimura Y, Kaiya H, Nata M, Okazaki Y (2007) A correlation between increases in suicide rates and increases in male unemployment rates in Mie prefecture, Japan. *Ind Health* 45:177–180. doi:10.2486/indhealth.45.177
- Ministry of Health, Labour, and Welfare (2012) <http://www.mhlw.go.jp/stf/shingi/2r9852000001ifbg-att/2r9852000001ifhr.pdf>. Accessed 18 Sept 2012 (in Japanese)
- Schutt RK, Meschede T, Rierdan J (1994) Distress, suicidal thoughts, and social support among homeless adults. *Health Soc Behav* 35:134–142
- Eynan R, Langley J, Tolomiczenko G, Rhodes AE, Links P, Wasylenko D, Goering P (2002) The association between homelessness and suicidal ideation and behaviors: results of a cross-sectional survey. *Suicide Life Threat Behav* 32:418–427. doi:10.1521/suli.32.4.418.22341
- Schinka JA, Schinka KC, Casey RJ, Kaspro W, Bossarte RM (2012) Suicidal behavior in a national sample of older homeless veterans. *Am J Public Health* 102:S147–S153. doi:10.2105/AJPH.2011.300436
- Desai RA, Liu-Mares W, Dausey DJ, Rosenheck RA (2003) Suicidal ideation and suicide attempts in a sample of homeless people with mental illness. *J Nerv Ment Dis* 191:365–371
- Morikawa S, Uehara R, Okuda K, Shimizu H, Nakamura Y (2011) Prevalence of psychiatric disorders among homeless people in one area of Tokyo. *Jpn J Public Health* 58:331–339 (in Japanese)
- US Department of Housing and Urban Development's (2010) Annual Homeless Assessment Report. <http://www.hudhre.info/documents/2010HomelessAssessmentReport.pdf>. Accessed 18 Sept 2012
- Ministry of Health, Labour, and Welfare (2012) <http://www.mhlw.go.jp/stf/houdou/2r98520000027ptf-att/2r98520000027pw4.pdf>. Accessed 18 Sept 2012 (in Japanese)
- Ministry of Internal Affairs and Communications (2013) http://law.e-gov.go.jp/cgi-bin/idxselect.cgi?IDX_OPT=3&H_NAME=&H_NAME_YOMI=%82%a0&H_NO_GENGO=H&H_NO_YEAR=14&H_NO_TYPE=2&H_NO_NO=105&H_FILE_NAME=H14HO105&H_RYAKU=1&H_CTG=1&H_YOMI_GUN=1&H_CTG_GUN=1. Accessed 8 Oct 2013 (in Japanese)
- United States Department of Housing and Urban Development "Synopsis of the McKinney–Vento Act". http://portal.hud.gov/hudportal/documents/huddoc?id=HAAA_HEARTH.pdf. Accessed 18 Sept 2012
- Kessler RC, Borges G, Walters EE (1999) Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Arch Gen Psychiatry* 56:617–626. doi:10.1001/archpsyc.56.7.617
- Beck AT, Steer RA, Kovacs M, Garrison B (1995) Hopelessness and eventual suicide: a 10-year prospective study of patients hospitalized with suicidal ideation. *Am J Psychiatry* 142:559–563
- Muraoka Y, Oiji A, Ihara Y (1996) Physical, psychological and social factors of depressed older residents in the community. *Jpn J Geriatr Psychiatry* 7:397–407 (in Japanese)
- Koizumi Y, Awata S, Seki T, Nakaya N, Kuriyama S, Suzuki Y, Ohmori K, Hozawa A, Ebihara S, Arai H, Tsuji I (2004) Association between social support and depression in the elderly Japanese population. *Nihon Ronen Igakkai Zasshi* 41:426–433 (in Japanese)

20. Koizumi Y, Awata S, Kuriyama S, Ohmori K, Hozawa A, Seki T, Matsuoka H, Tsuji I (2005) Association between social support and depression status in the elderly: results of a 1-year community-based prospective cohort study in Japan. *Psychiatry Clin Neurosci* 59:563–569. doi:[10.1111/j.1440-1819.2005.01415.x](https://doi.org/10.1111/j.1440-1819.2005.01415.x)
21. Awata S, Seki T, Koizumi Y, Sato S, Hozawa A, Omori K, Kuriyama S, Arai H, Nagatomi R, Matsuoka H, Tsuji I (2005) Factors associated with suicidal ideation in an elderly urban Japanese population: a community-based, cross-sectional study. *Psychiatry Clin Neurosci* 59:327–336. doi:[10.1111/j.1440-1819.2005.01378.x](https://doi.org/10.1111/j.1440-1819.2005.01378.x)
22. Awata S, Bech P, Koizumi Y, Seki T, Kuriyama S, Hozawa A, Ohmori K, Nakaya N, Matsuoka H, Tsuji I (2007) Validity and utility of the Japanese version of the WHO-Five Well-Being Index in the context of detecting suicidal ideation in elderly community residents. *Int Psychogeriatr* 19:77–88. doi:[10.1017/S1041610206004212](https://doi.org/10.1017/S1041610206004212)
23. US Preventive Services Task Force (2012) Screening for depression. Recommendations and rationale. <http://www.uspreventiveservicestaskforce.org/3rduspstf/depression/depressrr.htm#ref3>. Accessed 18 Sept 2012
24. Arroll B, Khin N, Kerse N (2003) Screening for depression in primary care with two verbally asked questions: cross-sectional study. *BMJ* 327:1144–1146. doi:[10.1136/bmj.327.7424.1144](https://doi.org/10.1136/bmj.327.7424.1144)
25. Ono Y, Kawakami N, Nakane Y, Nakamura Y, Tachimori H, Iwata N, Uda H, Nakane H, Watanabe M, Naganuma Y, Furukawa TA, Hata Y, Kobayashi M, Miyake Y, Tajima M, Takeshima T, Kikkawa T (2004) Prevalence of and risk factors for suicide-related outcomes in the World Health Organization World Mental Health Surveys Japan. *Psychiatry Clin Neurosci* 62:442–449. doi:[10.1111/j.1440-1819.2008.01823.x](https://doi.org/10.1111/j.1440-1819.2008.01823.x)
26. Tiet QQ, Finney JW, Moos RH (2006) Recent sexual abuse, physical abuse, and suicide attempts among male veterans seeking psychiatric treatment. *Psychiatr Serv* 57:107–113. doi:[10.1176/appi.ps.57.1.107](https://doi.org/10.1176/appi.ps.57.1.107)
27. Bertolote JM, Fleischmann A (2002) Suicide and psychiatric diagnosis: a worldwide perspective. *World Psychiatry* 1:181–185
28. Beautrais AL, Joyce PR, Mulder RT, Fergusson DM, Deavoll BJ, Nightingale SK (1996) Prevalence and comorbidity of mental disorders in persons making serious suicide attempts: a case-control study. *Am J Psychiatry* 153:1009–1014
29. Petronis KR, Samuels JF, Moscicki EK, Anthony JC (1990) An epidemiologic investigation of potential risk factors for suicide attempts. *Soc Psychiatry Psychiatr Epidemiol* 25:193–199. doi:[10.1007/BF00782961](https://doi.org/10.1007/BF00782961)
30. Gelberg L, Linn LS, Leake BD (1988) Mental health, alcohol and drug use, and criminal history among homeless adults. *Am J Psychiatry* 145:191–196
31. World Health Organization (2008) Integrating mental health into primary care: a global perspective. World Health Organization, Geneva
32. National Center of Neurology and Psychiatry, National Institute of Mental Health, Department of Mental Health Policy and Evaluation (2013) Visions in for reform research homepage. http://www.ncnp.go.jp/nimh/keikaku/vision/index_e.html. Accessed 8 Oct 2013
33. OECD (2013) Key tables from OECD. 35. Psychiatric care beds. http://www.oecd-ilibrary.org/social-issues-migration-health/psychiatric-care-beds_psyicarebed-table-en. Accessed 8 Oct 2013
34. Hwang SW, Kirst MJ, Chiu S, Tolomiczenko G, Kiss A, Cowan L, Levinson W (2009) Multidimensional social support and the health of homeless individuals. *J Urban Health* 86:791–803. doi:[10.1007/s11524-009-9388-x](https://doi.org/10.1007/s11524-009-9388-x)
35. Glisson GM, Thyer BA, Fischer RL (2001) Serving the homeless: evaluating the effectiveness of homeless shelter services. *J Sociol Soc Welf* 28:89–97
36. Wolf J, Burnam A, Koegel P, Sullivan G, Morton S (2001) Changes in subjective quality of life among homeless adults who obtain housing: a prospective examination. *Soc Psychiatry Psychiatr Epidemiol* 36:391–398. doi:[10.1007/s001270170029](https://doi.org/10.1007/s001270170029)