BMJ Open

Relationship between individual characteristics, neighborhood contexts, and help-seeking intentions for mental illness

Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2015-008261
Article Type:	Research
Date Submitted by the Author:	21-Mar-2015
Complete List of Authors:	Suka, Machi; The Jikei University School of Medicine, Department of Public Health & Environmental Medicine Yamauchi, Takashi Sugimori, Hiroki
Primary Subject Heading:	Public health
Secondary Subject Heading:	Mental health
Keywords:	PUBLIC HEALTH, MENTAL HEALTH, EPIDEMIOLOGY

Relationship between individual characteristics, neighborhood contexts, and help-seeking intentions for mental illness

Machi Suka[1], Takashi Yamauchi[2], Hiroki Sugimori[3]

1 Department of Public Health and Environmental Medicine, The Jikei University School of Medicine, Tokyo, Japan

2 Center for Suicide Prevention, National Institute of Mental Health, National Center of Neurology and Psychiatry, Tokyo, Japan

3 Department of Preventive Medicine, Graduate School of Sports and Health Sciences, Daito Bunka University, Saitama, Japan

Correspondence to: Machi Suka

Department of Public Health and Environmental Medicine, The Jikei University School of Medicine, 3-25-8 Nishi-Shimbashi, Minato-ku, Tokyo 105-8461, Japan

TEL +81-3-3433-1111, FAX +81-3-5472-7526, E-mail suka@jikei.ac.jp

Key words: help-seeking, mental illness, neighborhood context, path analysis, questionnaire survey

Word count: 2988 (excluding title page, abstract, references, figures, and tables)

ABSTRACT

Objective: Encouraging help-seeking for mental illness is essential for prevention of suicide. This study examined the relationship between individual characteristics, neighborhood contexts, and help-seeking intentions for mental illness for the purpose of elucidating the role of neighborhood in the help-seeking process.

Design, setting, and participants: A cross-sectional web-based survey was conducted in June 2014 among Japanese adults aged 20-59 years. Eligible respondents who did not have a serious health condition were included in this study (n=3,308).

Main outcome measures: Participants were asked how likely they would seek help from someone close to them (informal help) and medical professionals (formal help), respectively if they were suffering serious mental illness. Path analysis with structural equation modeling was performed to represent plausible connections between individual characteristics, neighborhood contexts, and the informal and formal help-seeking intentions.

Results: The acceptable fitting model indicated that those who had a tendency to consult about everyday affairs were significantly more likely to express the informal help-seeking intention, which was directly associated with the formal help-seeking intention. Those living in a communicative neighborhood where neighbors say hello whenever they pass each other were significantly more likely to express both the informal and formal help-seeking intentions. Those living in a supportive neighborhood where neighbors work together to solve neighborhood problems were significantly more likely to express the informal help-seeking intention. Adequate health literacy was directly associated with both the informal and formal help-seeking intentions, along with having an indirect effect on the formal help-seeking intention through developed positive perception of professional help.

Conclusion: The results of this study bear out the hypothesis that neighborhood context contributes to help-seeking intentions for mental illness. Living in a neighborhood with a

communicative atmosphere and having adequate health literacy were acknowledged as possible facilitating factors for both informal and formal help-seeking for mental illness.

Strengths and limitations of this study

- Previous studies have revealed the individual factors that may inhibit or facilitate help-seeking for mental illness, but less is known about the neighborhood factors. This study represents the first attempt to elucidate multifactorial mechanisms for help-seeking using structural equation modeling. Our final structural equation model illustrated the pathways linking individual and neighborhood factors to informal and formal help-seeking intentions and bore out the hypothesis that neighborhood context contributes to help-seeking intentions for mental illness.
- The study design is cross-sectional and self-reported so we cannot reject the possibility of reverse causation or common method bias. The study subjects may not be representative of the general population. Further studies are needed to confirm the findings and refine the model. Moreover, the relationship between help-seeking intentions and actual help-seeking should be investigated in future.

INTRODUCTION

The World Health Organization published its first report on suicide prevention in 2014.[1] According to the report, more than 800,000 people die by suicide every year. While the reasons that people commit suicide vary widely, almost all suicide victims have any signs or symptoms of mental illness at the time of their death. Unfortunately, people do not always seek help when they suffer mental illness or have suicidal thoughts.[2,3] Encouraging help-seeking for mental illness is essential for prevention of suicide.

A social ecological perspective acknowledges that health behavior is influenced by the social environment.[4] While the proximal cause of health behavior lies within the individual rather than in the social environment, changes in the social environment will produce changes in individuals. Similarly to other health behaviors, help-seeking for mental illness is considered to be determined through the interaction between individuals and their environment.[2,3,5] Traditionally, public health strategies for encouraging help-seeking have focused on modifying individual factors such as knowledge and skills. Once the factors in the social environment that can affect help-seeking are identified, the focus of strategy will broaden to include the environmental factors.

The social environment is a broad multidimensional concept that includes the groups to which we belong, the neighborhoods in which we live, and the policies which we create to order our lives.[6] Neighborhood is the next smallest social unit after family, in which face-to-face interactions occur among members. Previous studies have revealed that neighborhood context, or more specifically neighborhood social capital is associated with health behaviors such as smoking, drinking, diet, and physical activity.[7] The impact of neighborhood context on health behavior may be worth considering when developing public health strategies for encouraging help-seeking. Unfortunately, to our knowledge, there have been no studies that examined to what extent neighborhood context contributes to

help-seeking and what factors are responsible for the neighborhood effect. Little is known about the role of neighborhood in the help-seeking process.

The aim of this study was to determine the relationship between individual characteristics, neighborhood contexts, and help-seeking intentions for mental illness. Compared to previous studies, this study examined a wider variety of factors that may affect help-seeking decision making. Path analysis with structural equation modeling was performed to represent plausible multifactorial mechanisms for help-seeking and elucidate the role of neighborhood in the help-seeking process. We believe the findings of this study will provide a new direction for public health strategies for encouraging help-seeking or suicide prevention policies.

METHODS

Subjects

A cross-sectional web-based survey was conducted in June 2014 among Japanese adults aged 20-59 years who lived in four prefectures of Chiba, Niigata, Nagano, and Fukuoka in Japan. Medical professionals and students were excluded from recruitment because their attitudes to help-seeking seem different in kind from ordinary people's ones. The study protocol was approved by the ethics committee of the Jikei University School of Medicine and has been conducted in accordance with the Ethical Guidelines for Epidemiological Studies by the Japanese Government.

An online research company (INTAGE, INC., Tokyo, Japan) contracted to create web questionnaire forms and collect anonymous responses (n=3200). The company has a nationwide research panel of 1.2 million registrants. At the time of the survey, the registrants aged 20-59 years who were not medical professionals or students and lived in the four prefectures totaled 46,258 (20,071 males and 26,187 females). Recruitment e-mails were sent to 8,721 eligible registrants who were randomly selected from each age/gender/prefecture

stratum. Applicants for participation in the survey were accepted in the order of receipt until the number of participants reached the quotas (100 people for each age/gender/prefecture stratum). All participants voluntarily agreed to complete the survey. A total of 3,365 responses were obtained over 8 days of recruitment. Of these, 6 subjects reported having serious health conditions and 51 subjects provided incomplete or inconsistent answers to questions. The remaining 3,308 subjects were finally included in this study. Table 1 shows the characteristics of the study subjects.

Measures

The questionnaire asked about help-seeking intentions for mental illness, health status, exposure to mental illness, health literacy, belief about professional help, social network, attitudes to everyday affairs, and neighborhood context. The components of the questionnaire relevant to this study are detailed below.

Help-seeking intentions for mental illness

Participants were asked to rate how likely they would seek help from 1) someone close to them such as family, relatives, friends, and colleagues (informal sources) and 2) medical professionals (formal sources), respectively if they were suffering serious mental illness. Those who gave affirmative responses on a four-point scale (certainly yes/probably yes/probably no/certainly no) were counted as having informal and formal help-seeking intentions, respectively. Those who gave negative responses to both questions were counted as having no help-seeking intentions.

Health status

Participants were asked to report whether they had any chronic disease undergoing

medical treatment. The list included hypertension, diabetes, dyslipidemia, stroke, heart trouble, renal failure, cancer, insomnia, depression, and others.

Exposure to mental illness

Participants were asked about their psychiatric history – whether they have the experience of consulting health professionals about their mental health. The Reported and Intended Behaviour Scale (RIBS)[8] were used to determine the extent of contact with people with mental illness. The first subscale consists of four questions about living with, working with, living nearby, and having a close friendship with people with mental illness, either at present or in the past. Those who answered 'yes' to at least one question were counted as having had contact with people with mental illness. Participants were also asked whether someone close to them was engaged in psychiatry.

Health literacy

The 14-item Health Literacy Scale (HLS-14)[9] was used to measure health literacy. The scale consists of 5 items for functional literacy, 5 items for communicative literacy, and 4 items for critical literacy. Respondents choose one of five options in response to each statement. The scores on the items were summed up to give the HLS-14 score (range 14-70 points) for each respondent. Higher scores indicate having better health literacy.

Belief about professional help

Referring to the questionnaires for the European Study of Epidemiology of Mental Disorders,[10] perceived effectiveness of professional help was measured using the following two questions: 1) of the people who see a professional for serious mental illness, what percent do you think are helped? (range 0-100%); 2) of those with serious mental illness who do not

get professional help, what percent do you think get better even without it? (range 0-100%). The percentages on the two questions were subtracted (question 1 minus question 2) and then the answers were trichotomized into positive (1<%, better than no help), neutral (0%, equal to no help), and negative (<-1%, worse than no help). Participants were also asked whether they would be embarrassed if their friends knew they were getting professional help for mental illness.

Social network

The abbreviated Lubben Social Network Scale (LSNS-6)[11,12] was used to measure social network. The scale consists of 3 items for family ties and 3 items for friendship ties. Respondents choose one of six options in response to each statement. The scores on the items were summed up to give the LSNS-6 score (range 6-36 points) for each respondent. Higher scores indicate having greater ties to family and friends.

Attitudes to everyday affairs

Participants were asked to rate how likely they would talk with someone close to them about the problem that brought stress and distress into their everyday lives. The question was derived from the Comprehensive Survey of Living Conditions (one of the statistical surveys by the Japanese Government). Those who gave affirmative responses on a four-point scale (certainly yes/probably yes/probably no/certainly no) were considered as having a tendency to consult about everyday affairs. Participants were also asked whether they felt reluctant to get help from others.

Neighborhood context

A variety of measures of neighborhood context have been proposed, but none of them is

recommended as a gold standard. Neighborhood is characterized as a geographically localized community often with face-to-face interactions among members. Referring to the questionnaire for the Health Survey of People Affected by the Great East Japan Earthquake,[13] four specific features of neighborhood context relevant to neighborhood social capital were assessed using the following statements, respectively: 1) neighbors say hello whenever they pass each other (communicativeness); 2) neighbors trust in each other (trustfulness); 3) neighbors help each other (helpfulness); and 4) neighbors work together to solve neighborhood problems (cooperativeness). Respondents choose one of five options (strongly agree/agree/not sure/disagree/strongly disagree) in response to each statement. The internal consistency was adequate (Cronbach α=0.87). For analysis, the responses were dichotomized into positive (strongly agree/agree) and negative (not sure/disagree/strongly disagree).

Statistical Analysis

The percentages of subjects who expressed the help-seeking intentions were compared using chi-square test. Significant variables on the univariate analysis were incorporated into a multiple logistic regression model to identify individual and neighborhood factors independently associated with the help-seeking intentions. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) were calculated from the models.

Path analysis with structural equation modeling was performed to test a hypothesis model linking individual and neighborhood factors to the help-seeking intentions for mental illness (Figure 1). In case of serious mental illness, formal (professional) help must be the best way to solve the problem. The formal help-seeking intention was therefore placed in the structural equation model as the outcome variable. On the basis of previous studies[5,14,15,16], the informal help-seeking intention was assumed to bring the formal help-seeking intention.

Besides sociodemographics, significant predictors derived from the multiple logistic regression analysis were placed in position according to the most plausible hypothesis. The strength of the relationship between two variables was estimated as a standardized regression weight (i.e. path coefficient, β). While there are no established guidelines regarding sample size requirements for structural equation modeling, a generally accepted rule of thumb is that the minimum sample size should ideally be 20 times the number of variables in the model.[17] The model generated in this study consisted of 14 variables and thus the final sample of 3,308 was sufficient for path analysis. Model fitness was assessed by goodness of fit index (GFI), adjusted goodness of fit index (AGFI), and root mean square error of approximation (RMSEA). For GFI and AGFI, a value of >0.9 indicates a good fit, and for RMSEA, a value of <0.08 is considered to be acceptable.[18] The initial model was improved by trimming paths with non-significant contributions. The final model consisted of paths with a path coefficient of >0.05 or <−0.05 ($p<0.05$).

All statistical analyses except for the path analysis were performed using SAS ver.9.4 software (SAS Institute, Cary, NC). The path analysis was performed using IBM SPSS Amos ver.22.0 (IBM Corp, Armonk, NY). Significant levels were set at $p<0.05$.

RESULTS

Table 2 shows the percentages of subjects who expressed the help-seeking intentions for mental illness. Of the 3308 subjects, 67.7% (n=2241) and 75.6% (n=2500) reported that they would seek help from informal and formal sources, respectively in case of serious mental illness. The majority (n=1938, 58.6%) expressed both the informal and formal help-seeking intentions. All the individual (a, b, c, d) and neighborhood (e) factors showed significant associations with either or both of the informal and formal help-seeking intentions in univariate analyses. Contrary to theoretical expectations, the help-seeking intentions were

more frequently observed in those who reported embarrassment toward professional help. This factor was considered irrelevant and removed from further analysis.

Table 3 shows the results of multiple logistic regression analysis. The following 3 individual and 1 neighborhood factors were significantly associated with both the informal and formal help-seeking intentions: contact with people with mental illness, health literacy, perceived effectiveness of professional help, tendency to consult about everyday affairs, and communicative neighborhood. Besides these, marital status, social network, and cooperative neighborhood were significantly associated with the informal help-seeking intention, while health status and psychiatric history were significantly associated with the formal help-seeking intention. The highest ORs for the informal and formal help-seeking intentions were found in tendency to consult about everyday affairs (OR 5.21) and perceived effectiveness of professional help (OR 2.16), respectively.

Figure 2 shows the results of path analysis. After trimming paths with non-significant contributions, the final model resulted in a better fit to the data (GFI 0.946; AGFI 0.918; RMSEA 0.072, 90%CI:0.068-0.075). The informal help-seeking intention had the greatest direct effect on the formal help-seeking intention. Besides this, psychiatric history, health literacy, perceived effectiveness of professional help, and communicative neighborhood had a direct effect on the formal help-seeking intention. Tendency to consult about everyday affairs and cooperative neighborhood had an indirect effect on the formal help-seeking intention through its effect on the informal help-seeking intention.

DISCUSSION

Causal effect of neighborhood context, or neighborhood effect, has been reported on various health outcomes including mental illness, whereas the methodology for estimating neighborhood effects, including definitions of neighborhood, measures of neighborhood

context, and analytical models, varies widely across studies.[19,20] In the absence of established methodology, this study examined four specific features of neighborhood context relevant to neighborhood social capital and their associations with help-seeking intentions for mental illness. A number of studies have been conducted to identify the individual factors that may inhibit or facilitate help-seeking for mental illness, but less is known about the neighborhood factors. Moreover, to date, there have been few attempts to elucidate multifactorial mechanisms for help-seeking using structural equation modeling. This is the first study that illustrated the pathways linking individual and neighborhood factors to informal and formal help-seeking intentions and bore out the hypothesis that neighborhood context contributes to help-seeking intentions for mental illness.

The final structural equation model (Figure 2) along with the results of multiple logistic regression analysis revealed the individual and neighborhood factors that may directly or indirectly affect help-seeking decision making. The neighborhood factors showed a relatively modest but significant effect compared to the individual factors. These results support the expectation that neighborhood context, or more specifically neighborhood social capital may exert influence on help-seeking for mental illness as it does on other health behaviors.[7] Moreover, the significant positive effect of communicative neighborhood seems to confirm the power of daily interactions with weak ties.[21] People who often interact with weak ties are more likely to have a sense of belonging and thus less likely to hesitate to seek help from people around them. Creating a neighborhood with a communicative atmosphere may be worth considering as a possible public health strategy for encouraging help-seeking.

In the multiple logistic regression analysis, the highest ORs for the informal and formal help intentions were found in tendency to consult about everyday affairs and perceived effectiveness of professional help, respectively. In the path analysis, tendency to consult about everyday affairs and health literacy were represented as a key player in help-seeking decision

making. Tendency to consult about everyday affairs seems to depend largely on personality, so that it may be difficult to achieve drastic changes in this factor using a public health approach. In contrast, health literacy skills can be developed through community-based educational outreach.[22] Improved health literacy will contribute to a better understanding of the effectiveness of professional help, which will increase the probability of formal help-seeking.[10] Developing health literacy skills may be worth considering as another possible public health strategy for encouraging help-seeking.

The multiple logistic regression analysis showed no significant association between sociodemographics and the help-seeking intentions, except between marital status and the informal help-seeking intention. Meanwhile, the path analysis showed that male gender, older age, unmarried status, lower education, and lower income were associated with decreased likelihoods of help-seeking intentions through their effects on tendency to consult about everyday affairs and health literacy. More attention should be paid to these high-risk groups when implementing public health strategies for encouraging help-seeking.

This study provides the first step toward understanding the role of neighborhood in the help-seeking process. On the contrary, it has a number of potential limitations. First, the study subjects were recruited from a nationwide panel of an online research company. Although we confirmed that the distribution of HLS-14 scores in the study subjects was quite similar to that obtained from our previous paper-based survey in Japanese healthcare facilities,[23] the selection bias may have influenced the results to some extent. Second, the help-seeking intentions were assessed on the assumption that the respondents themselves were suffering serious mental illness. Previous studies suggested that the probability of formal help-seeking for mental illness depends on severity of illness.[16,24,25] The percentages of informal and formal help-seeking intentions and the magnitude of individual and neighborhood factors may vary with different severity assumptions. Third, although the final structural equation model

revealed an acceptable fit to the data, it still leaves room for further improvement. The method of measuring neighborhood context was based on an official health survey,[13] but its validity has not been fully confirmed. Neighborhood physical environments such as population density and healthcare resources, which can affect mental health,[20] were not included in the analysis. Fourth, the study design is cross-sectional and self-reported so we cannot reject the possibility of reverse causation or common method bias. Further studies are needed to provide definitive evidence for the role of neighborhood in the help-seeking process and elucidate in more detail multifactorial mechanisms for help-seeking. Moreover, the relationship between help-seeking intentions and actual help-seeking should be investigated in future.

Conclusion

Help-seeking intentions for mental illness were directly associated with neighborhood context as well as individual characteristics. Especially note that living in a communicative neighborhood and having adequate health literacy were acknowledged as possible facilitating factors for both informal and formal help-seeking for mental illness. The effectiveness of efforts to increase help-seeking may be limited if only interventions targeted to individual factors are implemented. It may be worth attempting to incorporate community-based interventions for creating a neighborhood with a communicative atmosphere and those for developing health literacy skills into public health strategies for encouraging help-seeking or suicide prevention policies.

Contributors

MS was responsible for the design and conduct of the study, the collection, analysis, and interpretation of data, and the writing of the article. TY and HS contributed to the data interpretation and discussion of the implications of this work.

Funding

This work was supported by JSPS KAKENHI Grant Number 25460815. The funder had no role in the design and conduct of the study; in the collection, analysis, and interpretation of data; in the writing of the article; or in the decision to submit it for publication.

Competing interests

The authors have read and understood BMJ policy on declaration of interests and declare that they have no competing interests.

REFERENCES

1 World Health Organization. Preventing suicide: a global imperative. Available at : http://www.who.int/mental_health/suicide-prevention/world_report_2014 (Accessed January 12, 2014)

2 Bruffaerts R, Demyttenaere K, Hwang I, Chiu WT, Sampson N, Kessler RC, Alonso J, Borges G, de Girolamo G, de Graaf R, Florescu S, Gureje O, Hu C, Karam EG, Kawakami N, Kostyuchenko S, Kovess-Masfety V, Lee S, Levinson D, Matschinger H, Posada-Villa J, Sagar R, Scott KM, Stein DJ, Tomov T, Viana MC, Nock MK. Treatment of suicidal people around the world. Br J Psychiatry 2011; 199: 64-70.

3 Andrade LH, Alonso J, Mneimneh Z, Wells JE, Al-Hamzawi A, Borges G, Bromet E, Bruffaerts R, de Girolamo G, de Graaf R, Florescu S, Gureje O, Hinkov HR, Hu C, Huang Y, Hwang I, Jin R, Karam EG, Kovess-Masfety V, Levinson D, Matschinger H, O'Neill S, Posada-Villa J, Sagar R, Sampson NA, Sasu C, Stein DJ, Takeshima T, Viana MC, Xavier M, Kessler RC. Barriers to mental health treatment: results from the WHO World Mental Health surveys. Psychol Med 2014; 44: 1303-17.

4 McLaren L, Hawe P. Ecological perspectives in health research. J Epidemiol Community Health 2005; 59: 6-14.

5 Hui A, Wong P, Fu KW. Building a model for encouraging help-seeking for depression: a qualitative study in a Chinese society. BMC Psychol 2014; 2: 9.

6 Yen IH, Syme SL. The social environment and health: a discussion of the epidemiologic literature. Annu Rev Public Health. 1999; 20: 287-308.

7 Samuel LJ, Commodore-Mensah Y, Dennison Himmelfarb CR. Developing behavioral theory with the systematic integration of community social capital concepts. Health Educ Behav 2013; 41: 359-75.

8 Evans-Lacko S, Rose D, Little K, Flach C, Rhydderch D, Henderson C, Thornicroft G. Development and psychometric properties of the reported and intended behaviour scale (RIBS): a stigma-related behaviour measure. Epidemiol Psychiatr Sci 2011; 20: 263-71.

9 Suka M, Odajima T, Kasai M, Igarashi A, Ishikawa H, Kusama M, et al. The 14-item health literacy scale for Japanese adults (HLS-14). Environ Health Prev Med 2013; 18: 407-415.

10 ten Have M, de Graaf R, Ormel J, Vilagut G, Kovess V, Alonso J. Are attitudes towards mental health help-seeking associated with service use? Results from the European Study of Epidemiology of Mental Disorders. Soc Psychiatry Psychiatr Epidemiol 2010; 45: 153-63.

11 Lubben J, Blozik E, Gillmann G, Iliffe S, von Renteln Kruse W, Beck JC, Stuck AE. Performance of an abbreviated version of the Lubben Social Network Scale among three European community-dwelling older adult populations. Gerontologist 2006; 46: 503-13.

12 Kurimoto A, Awata S, Ohkubo T, Tsubota-Utsugi M, Asayama K, Takahashi K, Suenaga K, Satoh H, Imai Y. Reliability and validity of the Japanese version of the abbreviated Lubben Social Network Scale. Nihon Ronen Igakkai Zasshi 2011; 48: 149-57. Japanese.

13 Tsuji I (ed). Health Survey of People Affected by the Great East Japan Earthquake in Miyagi Prefecture (MHLW Grant Research Report 2013). Center for Community Health, Tohoku University Graduate School of Medicine, 2014. Japanese.

14 Griffiths KM, Crisp DA, Barney L, Reid R. Seeking help for depression from family and friends: a qualitative analysis of perceived advantages and disadvantages. BMC Psychiatry 2011; 11: 196.

15 Sakamoto S, Tanaka E, Neichi K, Ono Y. Where is help sought for depression or suicidal ideation in an elderly population living in a rural area of Japan? Psychiatry Clin Neurosci 2004; 58: 522-30.

16 Rüdell K, Bhui K, Priebe S. Do 'alternative' help-seeking strategies affect primary care

service use?: a survey of help-seeking for mental distress. BMC Public Health 2008; 8: 207.

17 Kline RB. Principles and Practice of Structural Equation Modeling, third edition. New York: Guilford Press, 2011.

18 McDonald RP, Ho MH. Principles and practice in reporting structural equation analyses. Psychol Methods 2002; 7: 64-82.

19 Diez Roux AV, Mair C. Neighborhoods and health. Ann N Y Acad Sci. 2010; 1186: 125-45.

20 Truong KD, Ma S. A systematic review of relations between neighborhoods and mental health. J Ment Health Policy Econ 2006; 9: 137-54.

21 Sandstrom GM, Dunn EW. Social interactions and well-being: the surprising power of weak ties. Pers Soc Psychol Bull 2014; 40: 910-22.

22 Nutbeam D. The evolving concept of health literacy. Soc Sci Med 2008; 67: 2072-8.

23 Suka M, Odajima T, Okamoto M, Sumitani M, Igarashi A, Ishikawa H, Kusama M, Yamamoto M, Nakayama T, Sugimori H. Relationship between health literacy, health information access, health behavior, and health status in Japanese people. Patient Educ Couns 2015 (in press)

24 Jorm AF, Griffiths KM, Christensen H, Parslow RA, Rogers B. Actions taken to cope with depression at different levels of severity: a community survey. Psychol Med 2004; 34: 293-9.

25 Brown J, Evans-Lacko S, Aschan L, Henderson MJ, Hatch SL, Hotopf M. Seeking informal and formal help for mental health problems in the community: a secondary analysis from a psychiatric morbidity survey in South London. BMC Psychiatry 2014; 14: 275.

Table 1 Characteristics of the study subjects

		N	
Gender	Male	1621	49.0%
	Female	1687	51.0%
Age	20–29 years	797	24.1%
	30–39	842	25.5%
	40–49	837	25.3%
	50–59	832	25.2%
Education	High school	1066	32.2%
	Junior college/vocational school	905	27.4%
	University/graduate school	1337	40.4%
Marital status	Married	1960	59.3%
	Unmarried	1184	35.8%
	Divorced/widowed	164	5.0%
Household	One person	464	14.0%
	More than two people	2844	86.0%
Occupation	No occupation	770	23.3%
	Temporary or part-time job	560	16.9%
	Full-time job	1978	59.8%
Household income	<2.0 million yen †	363	11.0%
	2.0–3.9 million	777	23.5%
	4.0–5.9 million	937	28.3%
	6.0–7.9 million	618	18.7%
	8.0–9.9 million	347	10.5%
	10.0+ million	266	8.0%
Health status	No disease	2449	73.6%
	Any disease	879	26.4%

† One million yen was about 10,000 U.S. dollars at the time of the survey.

Table 2 Percentages of subjects who expressed help seeking intentions for mental illness

(a) Sociodemographics

		N	Informal sources			Formal sources		
Gender	Male	1621	967	59.7%	<0.001	1170	72.2%	<0.001
	Female	1687	1274	75.5%		1330	78.8%	
Age	20–29 years	797	530	66.5%	0.483	551	69.1%	<0.001
	30–39	842	584	69.4%		638	75.8%	
	40–49	837	574	68.6%		647	77.3%	
	50–59	832	553	66.5%		664	79.8%	
Education	High school	1066	682	64.0%	<0.001	765	71.8%	0.002
	Junior college/vocational school	905	651	71.9%		706	78.0%	
	University/graduate school	1337	908	67.9%		1029	77.0%	
Marital status	Married	1960	1448	73.9%	<0.001	1543	78.7%	<0.001
	Unmarried	1184	696	58.8%		829	70.0%	
	Divorced/widowed	164	97	59.1%		128	78.0%	
Household	One person	464	251	54.1%	<0.001	326	70.3%	0.004
	More than two people	2844	1990	70.0%		2174	76.4%	
Occupation	No occupation	770	576	74.8%	<0.001	594	77.1%	0.506
	Temporary or part-time job	560	389	69.5%		422	75.4%	
	Full-time job	1978	1276	64.5%		1484	75.0%	
Household income	<2.0 million yen †	363	207	57.0%	<0.001	243	66.9%	<0.001
	2.0–3.9 million	777	498	64.1%		569	73.2%	
	4.0–5.9 million	937	643	68.6%		697	74.4%	
	6.0–7.9 million	618	436	70.6%		490	79.3%	
	8.0–9.9 million	347	259	74.6%		280	80.7%	
	10.0+ million	266	198	74.4%		221	83.1%	

(b) Health status and exposure to mental illness

		N	Informal sources			Formal sources		
Health status	No disease	2449	1666	68.0%	0.829	1786	72.9%	<0.001
	Any disease	879	400	45.5%		714	81.2%	
Psychiatric history	No	2689	1821	67.7%	0.949	1983	73.7%	<0.001
	Yes	619	420	67.9%		517	83.5%	
Contact with people with mental illness	No	2006	1260	62.8%	<0.001	1421	70.8%	<0.001
	Yes	1302	981	75.3%		1079	82.9%	
Familiar people engaged in psychiatry	No	3157	2125	67.3%	0.015	2382	75.5%	0.452
	Yes	151	116	76.8%		118	78.1%	

(c) Health literacy and belief about professional help

		N	Informal sources			Formal sources		
Health literacy (HLS-14)	Low	1853	1097	59.2%	<0.001	1243	67.1%	<0.001
	High	1455	1144	78.6%		1257	86.4%	
Embarrassment toward professional help	No	1644	1033	62.8%	<0.001	1133	68.9%	<0.001
	Yes	1664	1208	72.6%		1367	82.2%	
Perceived effectiveness of professional help	Negative	287	165	57.5%	<0.001	160	55.7%	<0.001
	Neutral	869	495	57.0%		533	61.3%	
	Positive	2152	1581	73.5%		1807	84.0%	

(d) Social network and attitudes to everyday affairs

		N	Informal sources			Formal sources		
Social network (LSNS-6)	Low	1891	1120	59.2%	<0.001	1360	71.9%	<0.001
	High	1417	1121	79.1%		1140	80.5%	
Tendency to consult about everyday affairs	No	1675	817	48.8%	<0.001	1152	68.8%	<0.001
	Yes	1633	1424	87.2%		1348	82.5%	
Reluctance to get help	No	1713	1220	71.2%	<0.001	1273	74.3%	0.080
	Yes	1595	1021	64.0%		1227	76.9%	

(e) Neighborhood context

		N	Informal sources			Formal sources		
Communicative neighborhood	No	1221	675	55.3%	<0.001	770	63.1%	<0.001
	Yes	2087	1566	75.0%		1730	82.9%	
Trustful neighborhood	No	2550	1651	64.7%	<0.001	1870	73.3%	<0.001
	Yes	758	590	77.8%		630	83.1%	
Helpful neighborhood	No	2311	1448	62.7%	<0.001	1657	71.7%	<0.001
	Yes	997	793	79.5%		843	84.6%	
Cooperative neighborhood	No	2045	1227	60.0%	<0.001	1434	70.1%	<0.001
	Yes	1263	1014	80.3%		1066	84.4%	

Table 3 Logistic regression predicting help seeking intentions for mental illness

		Informal sources			Formal sources		
		OR	95%CI		OR	95%CI	
Gender	Female	1.18	0.98	1.43	0.98	0.81	1.20
Age	plus 10 years	0.92	0.84	1.01	1.08	0.98	1.19
Education	High school	0.92	0.76	1.11	0.86	0.71	1.04
Marital status	Unmarried	0.77	0.61	0.96	0.90	0.71	1.13
	Divorced/widowed	0.60	0.40	0.91	0.89	0.57	1.41
Household	One person	1.05	0.80	1.38	0.80	0.60	1.05
Occupation	No occupation	1.14	0.90	1.44	0.85	0.67	1.07
Household income	plus 2 million yen	1.03	0.96	1.10	1.05	0.98	1.13
Health status	Any disease	0.94	0.77	1.16	1.52	1.20	1.92
Psychiatric history	Yes	0.99	0.79	1.26	1.66	1.27	2.17
Contact with people with mental illness	Yes	1.39	1.15	1.68	1.27	1.05	1.55
Familiar people engaged in psychiatry	Yes	1.03	0.66	1.61	0.80	0.51	1.24
Health literacy (HLS-14)	plus 1 point	1.06	1.04	1.07	1.07	1.06	1.09
Perceived effectiveness of professional help	Positive	1.43	1.26	1.62	2.16	1.90	2.45
Social network (LSNS-6)	plus 1 point	1.04	1.02	1.06	1.02	0.99	1.03
Tendency to consult about everyday affairs	Yes	5.21	4.31	6.30	1.66	1.37	2.02
Reluctance to get help	No	1.26	1.06	1.50	0.78	0.65	0.93
Communicative neighborhood	Yes	1.30	1.06	1.58	1.78	1.45	2.18
Trustful neighborhood	Yes	0.91	0.68	1.21	0.91	0.67	1.24
Helpful neighborhood	Yes	1.17	0.88	1.56	1.18	0.87	1.61
Cooperative neighborhood	Yes	1.50	1.18	1.89	1.22	0.96	1.56

OR: adjusted odds ratio, CI: confidence interval

Figure 1 Relationship between individual and neighborhood factors and help seeking intentions for mental illness (hypothesis model)

Figure 2 Path diagram for help seeking intentions for mental illness

Rectangles were observed variables. Ellipses were latent variables. Values on the single-headed arrows were standardized regression weights.

Values on the double-headed arrows were correlation coefficients. Model fitness: GFI 0.946; AGFI 0.918; RMSEA 0.072 (90%CI:0.068-0.075)

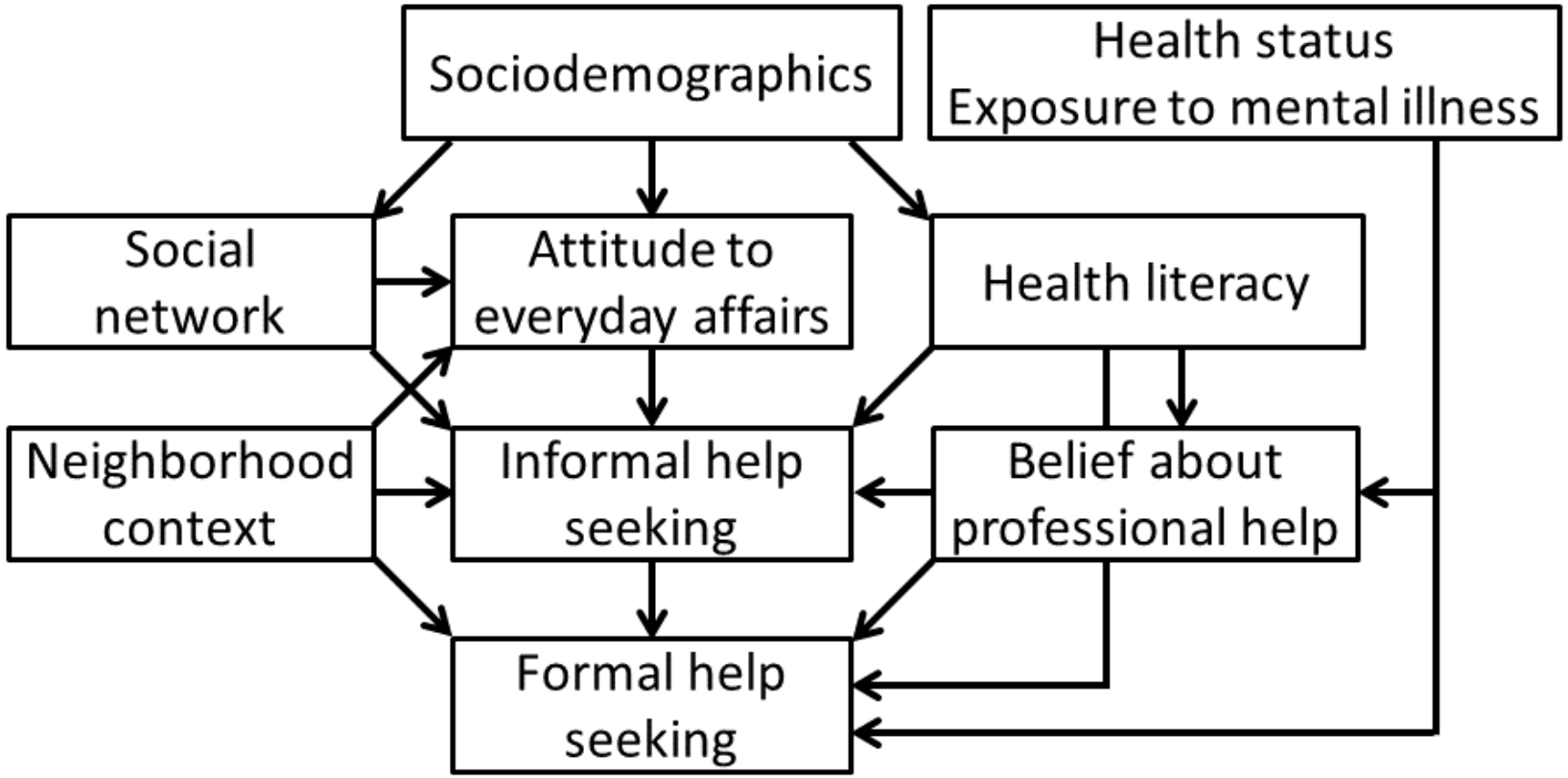


Figure 1

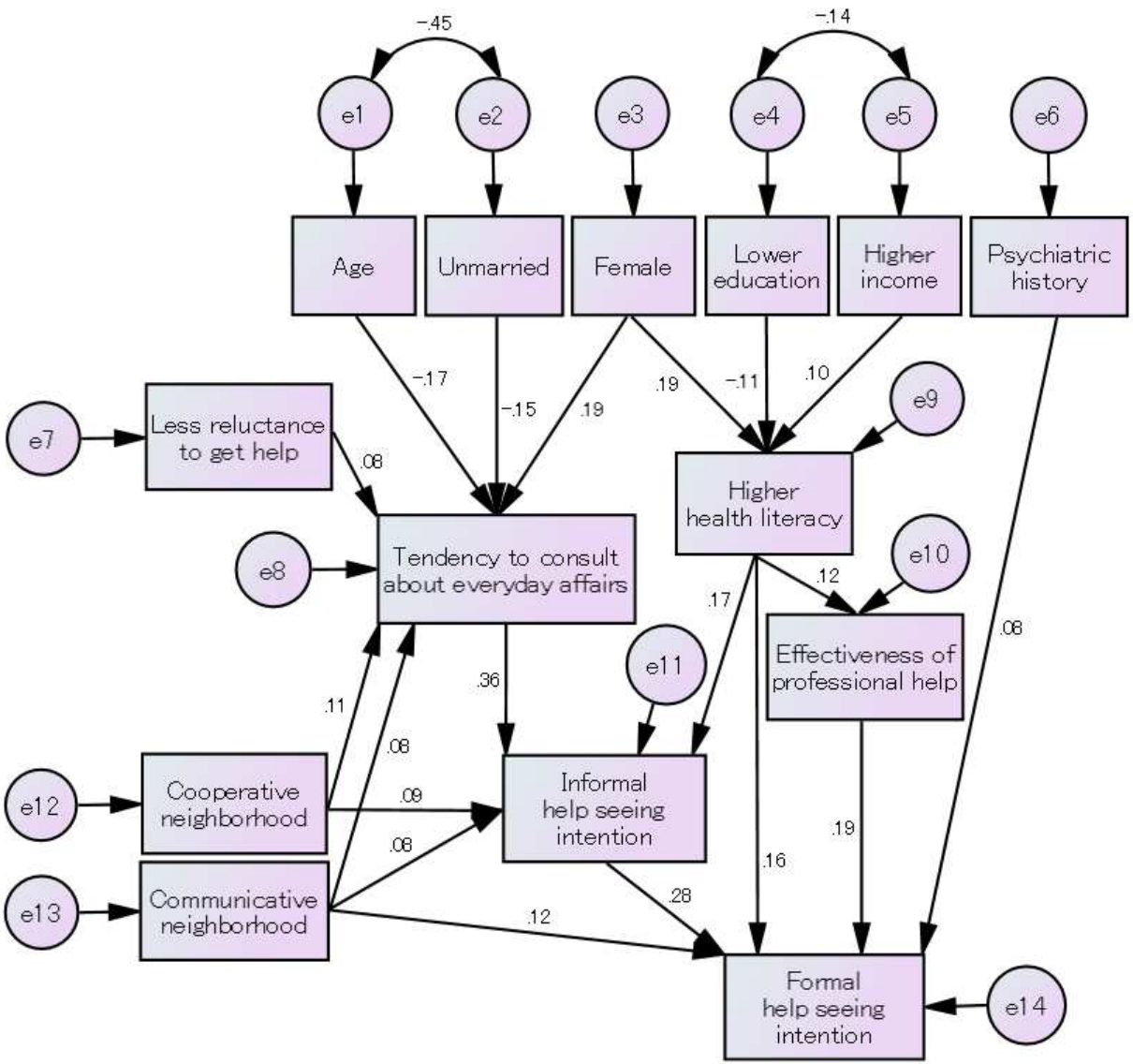


Figure 2

BMJ Open

Relationship between individual characteristics, neighborhood contexts, and help-seeking intentions for mental illness

Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2015-008261.R1
Article Type:	Research
Date Submitted by the Author:	09-Jun-2015
Complete List of Authors:	Suka, Machi; The Jikei University School of Medicine, Department of Public Health & Environmental Medicine Yamauchi, Takashi; Center for Suicide Prevention, National Institute of Mental Health, National Center of Neurology and Psychiatry, Sugimori, Hiroki; Daito Bunka University, Department of Preventive Medicine, Graduate School of Sports and Health Sciences
Primary Subject Heading:	Public health
Secondary Subject Heading:	Mental health
Keywords:	PUBLIC HEALTH, MENTAL HEALTH, EPIDEMIOLOGY

Relationship between individual characteristics, neighborhood contexts, and help-seeking intentions for mental illness

Machi Suka[1], Takashi Yamauchi[2], Hiroki Sugimori[3]

1 Department of Public Health and Environmental Medicine, The Jikei University School of Medicine, Tokyo, Japan

2 Center for Suicide Prevention, National Institute of Mental Health, National Center of Neurology and Psychiatry, Tokyo, Japan

3 Department of Preventive Medicine, Graduate School of Sports and Health Sciences, Daito Bunka University, Saitama, Japan

Correspondence to: Machi Suka

Department of Public Health and Environmental Medicine, The Jikei University School of Medicine, 3-25-8 Nishi-Shimbashi, Minato-ku, Tokyo 105-8461, Japan

TEL +81-3-3433-1111, FAX +81-3-5472-7526, E-mail suka@jikei.ac.jp

Key words: help-seeking, mental illness, neighborhood context, path analysis, questionnaire survey

Word count: 2988 (excluding title page, abstract, references, figures, and tables)

ABSTRACT

Objective: Encouraging help-seeking for mental illness is essential for prevention of suicide. This study examined the relationship between individual characteristics, neighborhood contexts, and help-seeking intentions for mental illness for the purpose of elucidating the role of neighborhood in the help-seeking process.

Design, setting, and participants: A cross-sectional web-based survey was conducted in June 2014 among Japanese adults aged 20-59 years. Eligible respondents who did not have a serious health condition were included in this study (n=3,308).

Main outcome measures: Participants were asked how likely they would seek help from someone close to them (informal help) and medical professionals (formal help), respectively if they were suffering serious mental illness. Path analysis with structural equation modeling was performed to represent plausible connections between individual characteristics, neighborhood contexts, and the informal and formal help-seeking intentions.

Results: The acceptable fitting model indicated that those who had a tendency to consult about everyday affairs were significantly more likely to express the informal help-seeking intention, which was directly associated with the formal help-seeking intention. Those living in a communicative neighborhood where neighbors say hello whenever they pass each other were significantly more likely to express both the informal and formal help-seeking intentions. Those living in a supportive neighborhood where neighbors work together to solve neighborhood problems were significantly more likely to express the informal help-seeking intention. Adequate health literacy was directly associated with both the informal and formal help-seeking intentions, along with having an indirect effect on the formal help-seeking intention through developed positive perception of professional help.

Conclusion: The results of this study bear out the hypothesis that neighborhood context contributes to help-seeking intentions for mental illness. Living in a neighborhood with a

communicative atmosphere and having adequate health literacy were acknowledged as possible facilitating factors for both informal and formal help-seeking for mental illness.

Strengths and limitations of this study

- Previous studies have revealed the individual factors that may inhibit or facilitate help-seeking for mental illness, but less is known about the neighborhood factors. This study represents the first attempt to elucidate multifactorial mechanisms for help-seeking using structural equation modeling. Our final structural equation model illustrated the pathways linking individual and neighborhood factors to informal and formal help-seeking intentions and bore out the hypothesis that neighborhood context contributes to help-seeking intentions for mental illness.
- The study design is cross-sectional and self-reported so we cannot reject the possibility of reverse causation or common method bias. The study subjects seem not to be representative of the general population. Further studies are needed to confirm the findings and refine the model. Moreover, the relationship between help-seeking intentions and actual help-seeking should be investigated in future.

INTRODUCTION

The World Health Organization published its first report on suicide prevention in 2014.[1] According to the report, more than 800,000 people die by suicide every year. While the reasons that people commit suicide vary widely, almost all suicide victims have signs or symptoms of mental illness at the time of their death. Unfortunately, people do not always seek help when they suffer mental illness or have suicidal thoughts.[2,3] Encouraging help-seeking for mental illness is essential for prevention of suicide.

A social ecological perspective acknowledges that health behavior is influenced by the social environment.[4] While the proximal cause of health behavior lies within the individual rather than in the social environment, changes in the social environment will produce changes in individuals. Similarly to other health behaviors, help-seeking for mental illness is considered to be determined through the interaction between individuals and their environment.[2,3,5] Traditionally, public health strategies for encouraging help-seeking have focused on modifying individual factors such as knowledge and skills. Once the factors in the social environment that can affect help-seeking are identified, the focus of strategy will broaden to include the environmental factors.

The social environment is a broad multidimensional concept that includes the groups to which we belong, the neighborhoods in which we live, and the policies which we create to order our lives.[6] Neighborhood is the next smallest social unit after family, in which face-to-face interactions occur among members. Previous studies have revealed that neighborhood context, or more specifically neighborhood social capital is associated with health behaviors such as smoking, drinking, diet, and physical activity.[7] The impact of neighborhood context on health behavior may be worth considering when developing public health strategies for encouraging help-seeking. Unfortunately, to our knowledge, there have been no studies that examined to what extent neighborhood context contributes to

help-seeking and what factors are responsible for the neighborhood effect. Little is known about the role of neighborhood in the help-seeking process.

The aim of this study was to determine the relationship between individual characteristics, neighborhood contexts, and help-seeking intentions for mental illness. On the basis of review of literature, we created a hypothesis model linking individual and neighborhood factors to informal and formal help-seeking intentions to represent plausible multifactorial mechanisms for help-seeking (Figure 1). Compared to previous studies, this study examined a wider variety of factors that may affect help-seeking decision making. Path analysis with structural equation modeling was performed to test the hypothesis model and elucidate the role of neighborhood in the help-seeking process. We believe the findings of this study will provide a new direction for public health strategies for encouraging help-seeking or suicide prevention policies.

METHODS

Subjects

A cross-sectional web-based survey was conducted in June 2014 among Japanese adults aged 20-59 years who lived in four prefectures of Chiba, Niigata, Nagano, and Fukuoka in Japan. Medical professionals and students were excluded from recruitment because their attitudes to help-seeking seem different in kind from ordinary people's ones. The study protocol was approved by the ethics committee of the Jikei University School of Medicine and has been conducted in accordance with the Ethical Guidelines for Epidemiological Studies by the Japanese Government.

An online research company (INTAGE, INC., Tokyo, Japan) contracted to create web questionnaire forms and collect anonymous responses (n=3200). The company has a nationwide research panel of 1.2 million registrants. At the time of the survey, the registrants

aged 20-59 years who were not medical professionals or students and lived in the four prefectures totaled 46,258 (20,071 males and 26,187 females). Recruitment e-mails were sent to 8,721 eligible registrants who were randomly selected from each age/gender/prefecture stratum. Applicants for participation in the survey were accepted in the order of receipt until the number of participants reached the quotas (100 people for each age/gender/prefecture stratum). All participants voluntarily agreed to complete the survey. A total of 3,365 responses were obtained over 8 days of recruitment. Of these, 6 subjects reported having serious health conditions and 51 subjects provided incomplete or inconsistent answers to questions. The remaining 3,308 subjects were finally included in this study.

Table 1 shows the characteristics of the study subjects. According to the 2010 national census,[8] the percentage of the Japanese population aged 20-59 years with university degrees was 21.9 %, considerably lower than that of this study (40.4%), whereas the percentages of married and employed population were 58.2% and 72.7%, respectively, almost equal to that of this study (59.3% and 76.7%, respectively).

Measures

The questionnaire asked about help-seeking intentions for mental illness, medical condition, exposure to mental illness, health literacy, belief about professional help, social network, attitudes to everyday affairs, and neighborhood context. The components of the questionnaire relevant to this study are detailed below.

Help-seeking intentions for mental illness

In the absence of a gold standard, the most commonly used methodology was used for measuring help-seeking intentions in this study.[9] Participants were asked to rate how likely they would seek help from 1) someone close to them such as family, relatives, friends, and

colleagues (informal sources) and 2) medical professionals (formal sources), respectively if they were suffering serious mental illness. Those who gave affirmative responses on a four-point scale (certainly yes/probably yes/probably no/certainly no) were counted as having informal and formal help-seeking intentions, respectively. Those who gave negative responses to both questions were counted as having no help-seeking intentions.

Medical condition

Participants were asked to report whether they had any chronic disease undergoing medical treatment. The list included hypertension, diabetes, dyslipidemia, stroke, heart trouble, renal failure, cancer, insomnia, depression, and others.

Exposure to mental illness

Participants were asked about their psychiatric history – whether they have the experience of consulting health professionals about their mental health. The Reported and Intended Behaviour Scale (RIBS)[10] were used to determine the extent of contact with people with mental illness. The first subscale consists of four questions about living with, working with, living nearby, and having a close friendship with people with mental illness, either at present or in the past. Those who answered 'yes' to at least one question were counted as having had contact with people with mental illness. Participants were also asked whether someone close to them was engaged in psychiatry.

Health literacy

The 14-item Health Literacy Scale (HLS-14)[11] was used to measure health literacy. The scale consists of 5 items for functional literacy, 5 items for communicative literacy, and 4 items for critical literacy. Respondents choose one of five options in response to each

statement. The scores on the items were summed up to give the HLS-14 score (range 14-70 points) for each respondent. Higher scores indicate having better health literacy.

Belief about professional help

Referring to the questionnaires for the European Study of Epidemiology of Mental Disorders,[12] perceived effectiveness of professional help was measured using the following two questions: 1) of the people who see a professional for serious mental illness, what percent do you think are helped? (range 0-100%); 2) of those with serious mental illness who do not get professional help, what percent do you think get better even without it? (range 0-100%). The percentages on the two questions were subtracted (question 1 minus question 2) and then the answers were trichotomized into positive (1<%, better than no help), neutral (0%, equal to no help), and negative (<-1%, worse than no help). Participants were also asked whether they would be embarrassed if their friends knew they were getting professional help for mental illness.

Social network

The abbreviated Lubben Social Network Scale (LSNS-6)[13,14] was used to measure social network. The scale consists of 3 items for family ties and 3 items for friendship ties. Respondents choose one of six options in response to each statement. The scores on the items were summed up to give the LSNS-6 score (range 6-36 points) for each respondent. Higher scores indicate having greater ties to family and friends.

Attitudes to everyday affairs

Participants were asked to rate how likely they would talk with someone close to them about the problem that brought stress and distress into their everyday lives. The question was

derived from the Comprehensive Survey of Living Conditions (one of the statistical surveys by the Japanese Government). Those who gave affirmative responses on a four-point scale (certainly yes/probably yes/probably no/certainly no) were considered as having a tendency to consult about everyday affairs. Participants were also asked whether they felt reluctant to get help from others.

Neighborhood context

A variety of measures of neighborhood context have been proposed, but none of them is recommended as a gold standard. Neighborhood is characterized as a geographically localized community often with face-to-face interactions among members. Referring to the questionnaire for the Health Survey of People Affected by the Great East Japan Earthquake,[15] four specific features of neighborhood context relevant to neighborhood social capital were assessed using the following statements, respectively: 1) neighbors say hello whenever they pass each other (communicativeness); 2) neighbors trust in each other (trustfulness); 3) neighbors help each other (helpfulness); and 4) neighbors work together to solve neighborhood problems (cooperativeness). Respondents choose one of five options (strongly agree/agree/not sure/disagree/strongly disagree) in response to each statement. The internal consistency was adequate (Cronbach α=0.87). For analysis, the responses were dichotomized into positive (strongly agree/agree) and negative (not sure/disagree/strongly disagree).

Statistical Analysis

The percentages of subjects who expressed the help-seeking intentions were compared using chi-square test. Significant variables on the univariate analysis were incorporated into a multiple logistic regression model to identify individual and neighborhood factors

independently associated with the help-seeking intentions. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) were calculated from the models.

Path analysis with structural equation modeling was performed to test the hypothesis model linking individual and neighborhood factors to help-seeking intentions for mental illness (Figure 1). In case of serious mental illness, formal (professional) help must be the best way to solve the problem. The formal help-seeking intention was therefore placed in the structural equation model as the outcome variable. On the basis of previous studies[5,16,17,18], the informal help-seeking intention was assumed to bring the formal help-seeking intention. Besides sociodemographics, significant predictors derived from the multiple logistic regression analysis were placed in position according to the most plausible hypothesis. The strength of the relationship between two variables was estimated as a standardized regression weight (i.e. path coefficient, β). While there are no established guidelines regarding sample size requirements for structural equation modeling, a generally accepted rule of thumb is that the minimum sample size should ideally be 20 times the number of variables in the model.[19] The model generated in this study consisted of 14 variables and thus the final sample of 3,308 was sufficient for path analysis. Model fitness was assessed by goodness of fit index (GFI), adjusted goodness of fit index (AGFI), and root mean square error of approximation (RMSEA). For GFI and AGFI, a value of >0.9 indicates a good fit, and for RMSEA, a value of <0.08 is considered to be acceptable.[20] The initial model was improved by trimming paths with non-significant contributions. The final model consisted of paths with a path coefficient of >0.05 or <−0.05 ($p<0.05$).

All statistical analyses except for the path analysis were performed using SAS ver.9.4 software (SAS Institute, Cary, NC). The path analysis was performed using IBM SPSS Amos ver.22.0 (IBM Corp, Armonk, NY). Significant levels were set at $p<0.05$.

RESULTS

Table 2 shows the percentages of subjects who expressed the help-seeking intentions for mental illness. Of the 3308 subjects, 67.7% (n=2241) and 75.6% (n=2500) reported that they would seek help from informal and formal sources, respectively in case of serious mental illness. The majority (n=1938, 58.6%) expressed both the informal and formal help-seeking intentions. All the individual (a, b, c, d) and neighborhood (e) factors showed significant associations with either or both of the informal and formal help-seeking intentions in univariate analyses. Contrary to theoretical expectations, the help-seeking intentions were more frequently observed in those who reported embarrassment toward professional help. This factor was considered irrelevant and removed from further analysis.

Table 3 shows the results of multiple logistic regression analysis. The following 3 individual and 1 neighborhood factors were significantly associated with both the informal and formal help-seeking intentions: contact with people with mental illness, health literacy, perceived effectiveness of professional help, tendency to consult about everyday affairs, and communicative neighborhood. Besides these, marital status, social network, and cooperative neighborhood were significantly associated with the informal help-seeking intention, while medical condition and psychiatric history were significantly associated with the formal help-seeking intention. The highest ORs for the informal and formal help-seeking intentions were found in tendency to consult about everyday affairs (OR 5.21) and perceived effectiveness of professional help (OR 2.16), respectively.

Figure 2 shows the results of path analysis. After trimming paths with non-significant contributions, the final model resulted in a better fit to the data (GFI 0.946; AGFI 0.918; RMSEA 0.072, 90%CI:0.068-0.075). The informal help-seeking intention had the greatest direct effect on the formal help-seeking intention. Besides this, psychiatric history, health literacy, perceived effectiveness of professional help, and communicative neighborhood had a

direct effect on the formal help-seeking intention. Tendency to consult about everyday affairs and cooperative neighborhood had an indirect effect on the formal help-seeking intention through its effect on the informal help-seeking intention.

DISCUSSION

Causal effect of neighborhood context, or neighborhood effect, has been reported on various health outcomes including mental illness, whereas the methodology for estimating neighborhood effects, including definitions of neighborhood, measures of neighborhood context, and analytical models, varies widely across studies.[21,22] In the absence of established methodology, this study examined four specific features of neighborhood context relevant to neighborhood social capital and their associations with help-seeking intentions for mental illness. A number of studies have been conducted to identify the individual factors that may inhibit or facilitate help-seeking for mental illness, but less is known about the neighborhood factors. Moreover, to date, there have been few attempts to elucidate multifactorial mechanisms for help-seeking using structural equation modeling. This is the first study that illustrated the pathways linking individual and neighborhood factors to informal and formal help-seeking intentions and bore out the hypothesis that neighborhood context contributes to help-seeking intentions for mental illness.

The final structural equation model (Figure 2) along with the results of multiple logistic regression analysis revealed the individual and neighborhood factors that may directly or indirectly affect help-seeking decision making. The neighborhood factors showed a relatively modest but significant effect compared to the individual factors. These results support the expectation that neighborhood context, or more specifically neighborhood social capital may exert influence on help-seeking for mental illness as it does on other health behaviors.[7] Moreover, the significant positive effect of communicative neighborhood seems to confirm

the power of daily interactions with weak ties.[23] People who often interact with weak ties are more likely to have a sense of belonging and thus less likely to hesitate to seek help from people around them. Creating a neighborhood with a communicative atmosphere may be worth considering as a possible public health strategy for encouraging help-seeking.

In the multiple logistic regression analysis, the highest ORs for the informal and formal help intentions were found in tendency to consult about everyday affairs and perceived effectiveness of professional help, respectively. In the path analysis, tendency to consult about everyday affairs and health literacy were represented as a key player in help-seeking decision making. Tendency to consult about everyday affairs seems to depend largely on personality, so that it may be difficult to achieve drastic changes in this factor using a public health approach. In contrast, health literacy skills can be developed through community-based educational outreach.[24] Improved health literacy will contribute to a better understanding of the effectiveness of professional help, which will increase the probability of formal help-seeking.[12] Developing health literacy skills may be worth considering as another possible public health strategy for encouraging help-seeking.

The multiple logistic regression analysis showed no significant association between sociodemographics and the help-seeking intentions, except between marital status and the informal help-seeking intention. Meanwhile, the path analysis showed that male gender, older age, unmarried status, lower education, and lower income were associated with decreased likelihoods of help-seeking intentions through their effects on tendency to consult about everyday affairs and health literacy. More attention should be paid to these high-risk groups when implementing public health strategies for encouraging help-seeking.

This study provides the first step toward understanding the role of neighborhood in the help-seeking process; however, it has a number of potential limitations. First, the study subjects were recruited from a nationwide panel of an online research company. As described

in the methods section, the study subjects included highly educated people twice as many as in the Japanese population. Although we confirmed that the distribution of HLS-14 scores in the study subjects was quite similar to that obtained from our previous paper-based survey in Japanese healthcare facilities,[25] the selection bias may have influenced the results to some extent. Second, the method of measuring help-seeking intentions was based on the most commonly used methodology,[9] but its validity has not been confirmed yet. Participants were asked to imagine themselves with serious mental illness and then report their help-seeking intentions. Because no detailed description was given, their answers depended on how they imagined the severity of the condition. Previous studies suggested that the probability of formal help-seeking for mental illness depends on severity of illness.[18,26,27] The percentages of informal and formal help-seeking intentions and the magnitude of individual and neighborhood factors may vary with different severity assumptions. Third, although the final structural equation model revealed an acceptable fit to the data, it still leaves room for further improvement. The HLS-14 and the LSNS-6 were validated in Japanese people,[11,14] but the other instruments used in the survey were not. Neighborhood physical environments such as population density and healthcare resources, which can affect mental health,[22] were not included in the analysis. Fourth, the study design is cross-sectional and self-reported so we cannot reject the possibility of reverse causation or common method bias. Further studies are needed to provide definitive evidence for the role of neighborhood in the help-seeking process and elucidate in more detail multifactorial mechanisms for help-seeking. Moreover, the relationship between help-seeking intentions and actual help-seeking should be investigated in future.

Conclusion

Help-seeking intentions for mental illness were directly associated with neighborhood

context as well as individual characteristics. Especially note that living in a communicative neighborhood and having adequate health literacy were acknowledged as possible facilitating factors for both informal and formal help-seeking for mental illness. The effectiveness of efforts to increase help-seeking may be limited if only interventions targeted to individual factors are implemented. It may be worth attempting to incorporate community-based interventions for creating a neighborhood with a communicative atmosphere and those for developing health literacy skills into public health strategies for encouraging help-seeking or suicide prevention policies.

Contributors

MS was responsible for the design and conduct of the study, the collection, analysis, and interpretation of data, and the writing of the article. TY and HS contributed to the data interpretation and discussion of the implications of this work.

Funding

This work was supported by JSPS KAKENHI Grant Number 25460815. The funder had no role in the design and conduct of the study; in the collection, analysis, and interpretation of data; in the writing of the article; or in the decision to submit it for publication.

Competing interests

The authors have read and understood BMJ policy on declaration of interests and declare that they have no competing interests.

Data Sharing

No additional data available.

Table 1 Characteristics of the study subjects

		N	
Gender	Male	1621	49.0%
	Female	1687	51.0%
Age	20–29 years	797	24.1%
	30–39	842	25.5%
	40–49	837	25.3%
	50–59	832	25.2%
Education	High school	1066	32.2%
	Junior college/vocational school	905	27.4%
	University/graduate school	1337	40.4%
Marital status	Married	1960	59.3%
	Unmarried	1184	35.8%
	Divorced/widowed	164	5.0%
Household	One person	464	14.0%
	More than two people	2844	86.0%
Occupation	No occupation	770	23.3%
	Temporary or part-time job	560	16.9%
	Full-time job	1978	59.8%
Household income	<2.0 million yen †	363	11.0%
	2.0–3.9 million	777	23.5%
	4.0–5.9 million	937	28.3%
	6.0–7.9 million	618	18.7%
	8.0–9.9 million	347	10.5%
	10.0+ million	266	8.0%
Medical condition	No disease	2449	73.6%
	Any disease	879	26.4%

† One million yen was about 10,000 U.S. dollars at the time of the survey.

Table 2 Percentages of subjects who expressed help seeking intentions for mental illness

(a) Sociodemographics

		N	Informal sources			Formal sources		
Gender	Male	1621	967	59.7%	<0.001	1170	72.2%	<0.001
	Female	1687	1274	75.5%		1330	78.8%	
Age	20–29 years	797	530	66.5%	0.483	551	69.1%	<0.001
	30–39	842	584	69.4%		638	75.8%	
	40–49	837	574	68.6%		647	77.3%	
	50–59	832	553	66.5%		664	79.8%	
Education	High school	1066	682	64.0%	<0.001	765	71.8%	0.002
	Junior college/vocational school	905	651	71.9%		706	78.0%	
	University/graduate school	1337	908	67.9%		1029	77.0%	
Marital status	Married	1960	1448	73.9%	<0.001	1543	78.7%	<0.001
	Unmarried	1184	696	58.8%		829	70.0%	
	Divorced/widowed	164	97	59.1%		128	78.0%	
Household	One person	464	251	54.1%	<0.001	326	70.3%	0.004
	More than two people	2844	1990	70.0%		2174	76.4%	
Occupation	No occupation	770	576	74.8%	<0.001	594	77.1%	0.506
	Temporary or part-time job	560	389	69.5%		422	75.4%	
	Full-time job	1978	1276	64.5%		1484	75.0%	
Household income	<2.0 million yen †	363	207	57.0%	<0.001	243	66.9%	<0.001
	2.0–3.9 million	777	498	64.1%		569	73.2%	
	4.0–5.9 million	937	643	68.6%		697	74.4%	
	6.0–7.9 million	618	436	70.6%		490	79.3%	
	8.0–9.9 million	347	259	74.6%		280	80.7%	
	10.0+ million	266	198	74.4%		221	83.1%	

(b) Medical condition and exposure to mental illness

		N	Informal sources			Formal sources		
Medical condition	No disease	2449	1666	68.0%	0.829	1786	72.9%	<0.001
	Any disease	879	400	45.5%		714	81.2%	
Psychiatric history	No	2689	1821	67.7%	0.949	1983	73.7%	<0.001
	Yes	619	420	67.9%		517	83.5%	
Contact with people with mental illness	No	2006	1260	62.8%	<0.001	1421	70.8%	<0.001
	Yes	1302	981	75.3%		1079	82.9%	
Familiar people engaged in psychiatry	No	3157	2125	67.3%	0.015	2382	75.5%	0.452
	Yes	151	116	76.8%		118	78.1%	

(c) Health literacy and belief about professional help

		N	Informal sources			Formal sources		
Health literacy (HLS-14)	Low	1853	1097	59.2%	<0.001	1243	67.1%	<0.001
	High	1455	1144	78.6%		1257	86.4%	
Embarrassment toward professional help	No	1644	1033	62.8%	<0.001	1133	68.9%	<0.001
	Yes	1664	1208	72.6%		1367	82.2%	
Perceived effectiveness of professional help	Negative	287	165	57.5%	<0.001	160	55.7%	<0.001
	Neutral	869	495	57.0%		533	61.3%	
	Positive	2152	1581	73.5%		1807	84.0%	

(d) Social network and attitudes to everyday affairs

		N	Informal sources			Formal sources		
Social network (LSNS-6)	Low	1891	1120	59.2%	<0.001	1360	71.9%	<0.001
	High	1417	1121	79.1%		1140	80.5%	
Tendency to consult about everyday affairs	No	1675	817	48.8%	<0.001	1152	68.8%	<0.001
	Yes	1633	1424	87.2%		1348	82.5%	
Reluctance to get help	No	1713	1220	71.2%	<0.001	1273	74.3%	0.080
	Yes	1595	1021	64.0%		1227	76.9%	

(e) Neighborhood context

		N	Informal sources			Formal sources		
Communicative neighborhood	No	1221	675	55.3%	<0.001	770	63.1%	<0.001
	Yes	2087	1566	75.0%		1730	82.9%	
Trustful neighborhood	No	2550	1651	64.7%	<0.001	1870	73.3%	<0.001
	Yes	758	590	77.8%		630	83.1%	
Helpful neighborhood	No	2311	1448	62.7%	<0.001	1657	71.7%	<0.001
	Yes	997	793	79.5%		843	84.6%	
Cooperative neighborhood	No	2045	1227	60.0%	<0.001	1434	70.1%	<0.001
	Yes	1263	1014	80.3%		1066	84.4%	

Table 3 Logistic regression predicting help seeking intentions for mental illness

		Informal sources				Formal sources			
		OR		95%CI		OR		95%CI	
Gender	Female	1.18		0.98	1.43	0.98		0.81	1.20
Age	plus 10 years	0.92		0.84	1.01	1.08		0.98	1.19
Education	High school	0.92		0.76	1.11	0.86		0.71	1.04
Marital status	Unmarried	0.77	*	0.61	0.96	0.90		0.71	1.13
	Divorced/widowed	0.60	*	0.40	0.91	0.89		0.57	1.41
Household	One person	1.05		0.80	1.38	0.80		0.60	1.05
Occupation	No occupation	1.14		0.90	1.44	0.85		0.67	1.07
Household income	plus 2 million yen	1.03		0.96	1.10	1.05		0.98	1.13
Medical condition	Any disease	0.94		0.77	1.16	1.52	***	1.20	1.92
Psychiatric history	Yes	0.99		0.79	1.26	1.66	***	1.27	2.17
Contact with people with mental illness	Yes	1.39	***	1.15	1.68	1.27	*	1.05	1.55
Familiar people engaged in psychiatry	Yes	1.03		0.66	1.61	0.80		0.51	1.24
Health literacy (HLS-14)	plus 1 point	1.06	***	1.04	1.07	1.07	***	1.06	1.09
Perceived effectiveness of professional help	Positive	1.43	***	1.26	1.62	2.16	***	1.90	2.45
Social network (LSNS-6)	plus 1 point	1.04	***	1.02	1.06	1.02		0.99	1.03
Tendency to consult about everyday affairs	Yes	5.21	***	4.31	6.30	1.66	***	1.37	2.02
Reluctance to get help	No	1.26	**	1.06	1.50	0.78	**	0.65	0.93
Communicative neighborhood	Yes	1.30	*	1.06	1.58	1.78	***	1.45	2.18
Trustful neighborhood	Yes	0.91		0.68	1.21	0.91		0.67	1.24
Helpful neighborhood	Yes	1.17		0.88	1.56	1.18		0.87	1.61
Cooperative neighborhood	Yes	1.50	***	1.18	1.89	1.22		0.96	1.56

OR: adjusted odds ratio, CI: confidence interval
* p<0.05, ** p<0.01, *** p<0.001

Figure legends

Figure 1 Relationship between individual and neighborhood factors and help seeking intentions for mental illness (hypothesis model)

Figure 2 Path diagram for help seeking intentions for mental illness

Rectangles were observed variables. Ellipses were latent variables. Values on the single-headed arrows were standardized regression weights. Values on the double-headed arrows were correlation coefficients. Model fitness: GFI 0.946; AGFI 0.918; RMSEA 0.072 (90%CI:0.068-0.075)

REFERENCES

1 World Health Organization. Preventing suicide: a global imperative. Available at : http://www.who.int/mental_health/suicide-prevention/world_report_2014 (Accessed June 1, 2015)

2 Bruffaerts R, Demyttenaere K, Hwang I, Chiu WT, Sampson N, Kessler RC, Alonso J, Borges G, de Girolamo G, de Graaf R, Florescu S, Gureje O, Hu C, Karam EG, Kawakami N, Kostyuchenko S, Kovess-Masfety V, Lee S, Levinson D, Matschinger H, Posada-Villa J, Sagar R, Scott KM, Stein DJ, Tomov T, Viana MC, Nock MK. Treatment of suicidal people around the world. Br J Psychiatry 2011; 199: 64-70.

3 Andrade LH, Alonso J, Mneimneh Z, Wells JE, Al-Hamzawi A, Borges G, Bromet E, Bruffaerts R, de Girolamo G, de Graaf R, Florescu S, Gureje O, Hinkov HR, Hu C, Huang Y, Hwang I, Jin R, Karam EG, Kovess-Masfety V, Levinson D, Matschinger H, O'Neill S, Posada-Villa J, Sagar R, Sampson NA, Sasu C, Stein DJ, Takeshima T, Viana MC, Xavier M, Kessler RC. Barriers to mental health treatment: results from the WHO World Mental Health surveys. Psychol Med 2014; 44: 1303-17.

4 McLaren L, Hawe P. Ecological perspectives in health research. J Epidemiol Community Health 2005; 59: 6-14.

5 Hui A, Wong P, Fu KW. Building a model for encouraging help-seeking for depression: a qualitative study in a Chinese society. BMC Psychol 2014; 2: 9.

6 Yen IH, Syme SL. The social environment and health: a discussion of the epidemiologic literature. Annu Rev Public Health. 1999; 20: 287-308.

7 Samuel LJ, Commodore-Mensah Y, Dennison Himmelfarb CR. Developing behavioral theory with the systematic integration of community social capital concepts. Health Educ Behav 2013; 41: 359-75.

8 Ministry of Internal Affairs and Communications. National Census 2010. Available at: http://www.e-stat.go.jp/SG1/estat/GL08020103.do?_toGL08020103_&tclassID=000001038689&cycleCode=0&requestSender=estat (Accessed June 1, 2015). Japanese.

9 Wilson CJ, Deane FP, Ciarrochi J, Rickwood D. Measuring help-seeking intentions: properties of the General Help-Seeking Questionnaire. Canadian Journal of Counseling 2005; 39: 15-28.

10 Evans-Lacko S, Rose D, Little K, Flach C, Rhydderch D, Henderson C, Thornicroft G. Development and psychometric properties of the reported and intended behaviour scale (RIBS): a stigma-related behaviour measure. Epidemiol Psychiatr Sci 2011; 20: 263-71.

11 Suka M, Odajima T, Kasai M, Igarashi A, Ishikawa H, Kusama M, et al. The 14-item health literacy scale for Japanese adults (HLS-14). Environ Health Prev Med 2013; 18: 407-415.

12 ten Have M, de Graaf R, Ormel J, Vilagut G, Kovess V, Alonso J. Are attitudes towards mental health help-seeking associated with service use? Results from the European Study of Epidemiology of Mental Disorders. Soc Psychiatry Psychiatr Epidemiol 2010; 45: 153-63.

13 Lubben J, Blozik E, Gillmann G, Iliffe S, von Renteln Kruse W, Beck JC, Stuck AE. Performance of an abbreviated version of the Lubben Social Network Scale among three European community-dwelling older adult populations. Gerontologist 2006; 46: 503-13.

14 Kurimoto A, Awata S, Ohkubo T, Tsubota-Utsugi M, Asayama K, Takahashi K, Suenaga K, Satoh H, Imai Y. Reliability and validity of the Japanese version of the abbreviated Lubben Social Network Scale. Nihon Ronen Igakkai Zasshi 2011; 48: 149-57. Japanese.

15 Tsuji I (ed). Health Survey of People Affected by the Great East Japan Earthquake in Miyagi Prefecture (MHLW Grant Research Report 2013). Center for Community Health, Tohoku University Graduate School of Medicine, 2014. Japanese.

16 Griffiths KM, Crisp DA, Barney L, Reid R. Seeking help for depression from family and friends: a qualitative analysis of perceived advantages and disadvantages. BMC Psychiatry 2011; 11: 196.

17 Sakamoto S, Tanaka E, Neichi K, Ono Y. Where is help sought for depression or suicidal ideation in an elderly population living in a rural area of Japan? Psychiatry Clin Neurosci 2004; 58: 522-30.

18 Rüdell K, Bhui K, Priebe S. Do 'alternative' help-seeking strategies affect primary care service use?: a survey of help-seeking for mental distress. BMC Public Health 2008; 8: 207.

19 Kline RB. Principles and Practice of Structural Equation Modeling, third edition. New York: Guilford Press, 2011.

20 McDonald RP, Ho MH. Principles and practice in reporting structural equation analyses. Psychol Methods 2002; 7: 64-82.

21 Diez Roux AV, Mair C. Neighborhoods and health. Ann N Y Acad Sci. 2010; 1186: 125-45.

22 Truong KD, Ma S. A systematic review of relations between neighborhoods and mental health. J Ment Health Policy Econ 2006; 9: 137-54.

23 Sandstrom GM, Dunn EW. Social interactions and well-being: the surprising power of weak ties. Pers Soc Psychol Bull 2014; 40: 910-22.

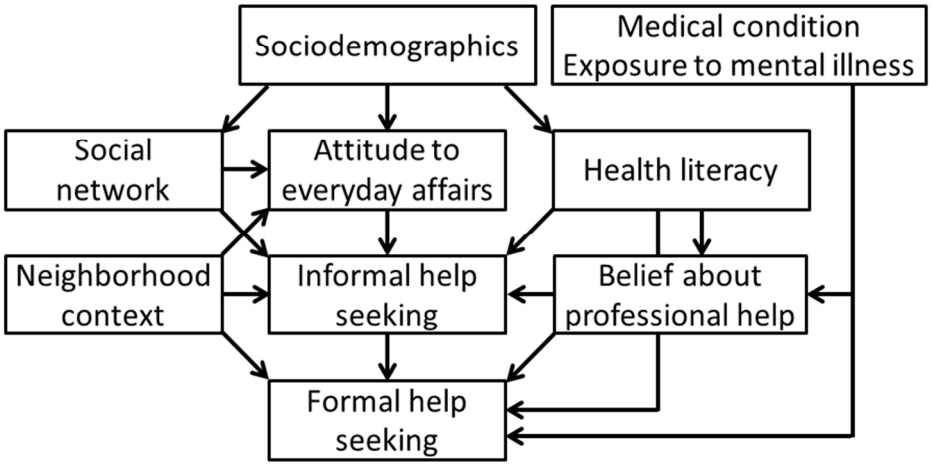
24 Nutbeam D. The evolving concept of health literacy. Soc Sci Med 2008; 67: 2072-8.

25 Suka M, Odajima T, Okamoto M, Sumitani M, Igarashi A, Ishikawa H, Kusama M, Yamamoto M, Nakayama T, Sugimori H. Relationship between health literacy, health information access, health behavior, and health status in Japanese people. Patient Educ Couns 2015; 98: 660-8.

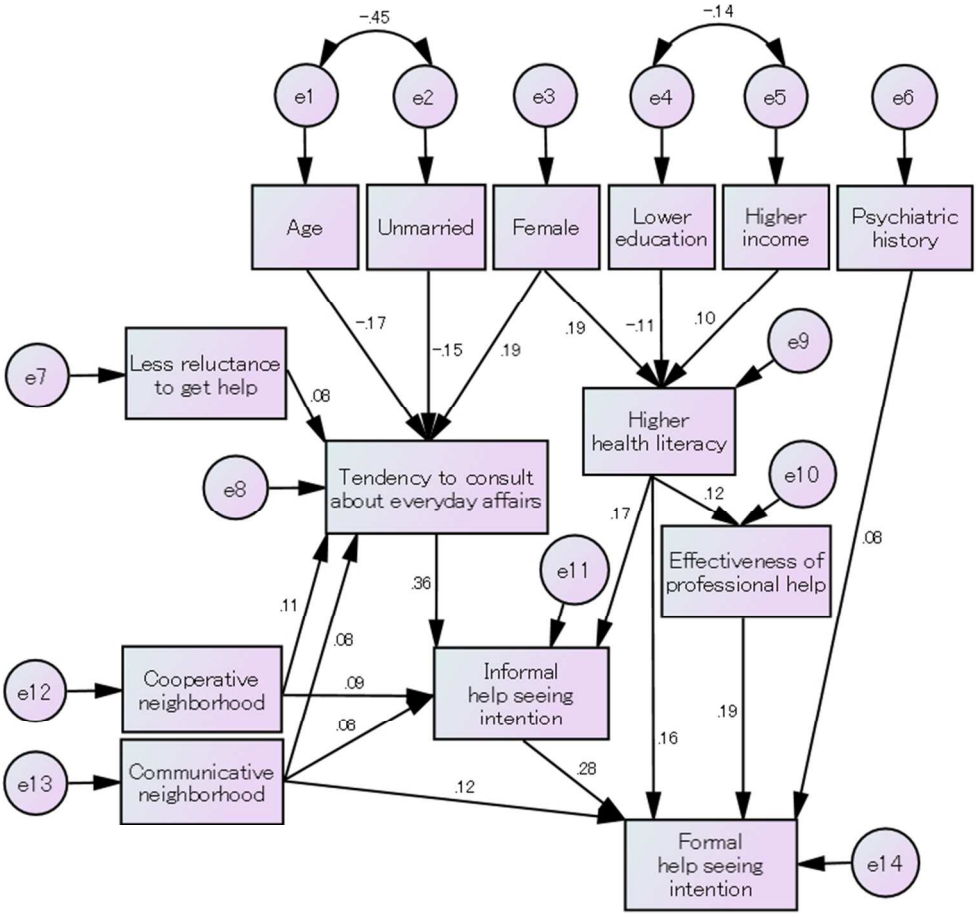
26 Jorm AF, Griffiths KM, Christensen H, Parslow RA, Rogers B. Actions taken to cope with

depression at different levels of severity: a community survey. Psychol Med 2004; 34: 293-9.

27 Brown J, Evans-Lacko S, Aschan L, Henderson MJ, Hatch SL, Hotopf M. Seeking informal and formal help for mental health problems in the community: a secondary analysis from a psychiatric morbidity survey in South London. BMC Psychiatry 2014; 14: 275.



254x142mm (96 x 96 DPI)



174x164mm (120 x 120 DPI)

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation
Title and abstract	1✓	(*a*) Indicate the study's design with a commonly used term in the title or the abstract
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found
Introduction		
Background/rationale	2✓	Explain the scientific background and rationale for the investigation being reported
Objectives	3✓	State specific objectives, including any prespecified hypotheses
Methods		
Study design	4✓	Present key elements of study design early in the paper
Setting	5✓	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection
Participants	6✓	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case
Variables	7✓	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable
Data sources/ measurement	8*✓	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group
Bias	9✓	Describe any efforts to address potential sources of bias
Study size	10✓	Explain how the study size was arrived at
Quantitative variables	11✓	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why
Statistical methods	12✓	(*a*) Describe all statistical methods, including those used to control for confounding
		(*b*) Describe any methods used to examine subgroups and interactions
		(*c*) Explain how missing data were addressed
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy
		(*e*) Describe any sensitivity analyses

Continued on next page

Results		
Participants	13*✓	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed
		(b) Give reasons for non-participation at each stage
		(c) Consider use of a flow diagram
Descriptive data	14*✓	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders
		(b) Indicate number of participants with missing data for each variable of interest
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)
Outcome data	15*✓	*Cohort study*—Report numbers of outcome events or summary measures over time
		Case-control study—Report numbers in each exposure category, or summary measures of exposure
		Cross-sectional study—Report numbers of outcome events or summary measures
Main results	16✓	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included
		(*b*) Report category boundaries when continuous variables were categorized
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period
Other analyses	17✓	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses
Discussion		
Key results	18✓	Summarise key results with reference to study objectives
Limitations	19✓	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias
Interpretation	20✓	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	21✓	Discuss the generalisability (external validity) of the study results
Other information		
Funding	22✓	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.