厚生労働科学研究費補助金
障害者対策総合研究事業

自殺総合対策大綱に関する
自殺の要因分析や支援方法等に関する研究

平成27年度　総括研究報告書

研究代表者　中込　和幸

平成28（2016）年3月

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Ⅰ．総括研究報告書

平成 27 年度 厚生労働科学研究費補助金（障害者対策総合研究事業）
総括研究報告書

自殺総合対策大綱に関する自殺の要因分析や支援方法等に関する研究

研究代表者　中込　和幸（国立精神・神経医療研究センター精神保健研究所）

研究要旨：

【目的】平成 24 年 8 月に見直しが行われた自殺総合対策大綱の基本的考え方、自殺を予防するための当面の重点施策等を踏まえて、わが国全体および特定の対象集団ごとに自殺の要因分析等による科学的エビデンスに基づいた支援・介入方法の開発を行うことを目的とした。

【方法】心理学的剖検による自殺の要因分析に関しては、従来の地域調査の方法に加え、東京都監察医務院との連携により調査実施体制を強化することで、調査事例数の増加を試みた。また、心理学的剖検調査では、自殺既遂者に性別・年代・居住地が一致する生存者を対照群として情報収集を行い、症例対照研究のデザインによる検討を行った。さらに、東京都監察医務院では死体検案調書等の分析を行い、心理学的剖検では調査の及ばない自殺事例の背景要因の分析を行った。加えて、児童青年期の自殺に関わる要因を明らかにするため、海外で行われた児童青年期の心理学的剖検研究の系統的レビュー、ならびに、前向きコホート研究データを用いた、糖尿病と自殺リスクの経時的変化に関する分析を行った。

【結果および考察】平成 27 年度には、遺族からのコンタクトならびに調査事例数が増加し、自殺予防総合対策センターと東京都監察医務院の連携による心理学的剖検の実施体制の構築が着実に進んでいることがうかがえた。また、心理学的剖検データの症例対照研究による解析では、男性では、借金をはじめとする経済的問題の経験率、アルコールに関係する様々な問題の経験率、アルコール依存症と大うつ病性障害が自殺の危険因子として同定された。しかし女性では、幼少期の親との死別・離別に加え家族内でのアルコールの問題が自殺の危険因子であった。また若年層では、いじめなどの学校問題や幼少期の親との死別・離別が自殺の危険因子であることが示唆された。

東京都監察医務院における死体検案調書の分析では、15 歳を境に若年者の自殺手段、家庭環境、精神疾患に明らかに違いがあること、ガスを用いた自殺では、近年、ヘリウムを用いた自殺が著明に増加していることが明らかにされた。また、児童青年期の自殺に関しては、精神科疾患の比率が少なく自殺前の明確なストレス要因や自殺の意図が明確ではないことが特徴として示された。さらに前向きコホートの分析から、59 歳以下の糖尿病罹患者における自殺リスクの高さが明らかにされた。

【結論】症例対照研究のデザインによる心理学的剖検調査を中心に、児童青年期の心理学的剖検研究の系統的レビュー、東京都監察医務院の検案資料の分析、大規模前向きコホート等を対象とした自殺の実態分析を行い、効果的な自殺予防対策への示唆を提示した。平成 24 年 8 月に見直しが行われた自殺総合対策大綱では、地域レベルの実践的な自殺対策への転換の必要性、ならびに若年層・自殺未遂者向けの対策の充実が謳われているが、本研究の成果はこれらに寄与するものである。

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A．研究目的

平成24年8月に見直しが行われた自殺総合対策大綱の基本的考え方、自殺を予防するための当面の重点施策等を踏まえて、わが国全体および特定の対象集団ごとに自殺の要因分析等による科学的エビデンスに基づいた支援・介入方法の開発を行うことを目的とした。

B．研究方法

心理学的剖検による自殺の要因分析に関しては、従来の地域調査の方法に加え、自殺予防総合対策センター（CSP）に本研究推進のための症例登録センター（仮）を設置するとともに、東京都監察医務院との連携により調査実施体制を強化し、調査事例数の増加を試みた。また、心理学的剖検調査では、「自殺予防と遺族支援のための基礎調査」によって収集された20歳以上の自殺死亡事例について、性別・年齢・居住地域を一致させた対照群に調査を実施し、症例対照研究の手法で自殺の危険因子を同定するとともに、自殺の危険因子の性差・年代差についても検討した。さらに、持続的な心理学的剖検研究のための体制として、地域の自死遺族支援の多様なステークホルダーとの間で互恵的な関係を形成するために平成26年度に発足させた「CSP自死遺族サポートネットワーク」を活用し、多様な情報発信の可能性について検討した。

また、東京都監察医務院においては、死体検案調書等を情報源として特に手段・方法に注目した自殺の実態調査を行い、心理学的剖検では調査の及ばない自殺事例の背景要因の分析を行った。さらに並行して、児童青年期の自殺に関わる要因を明らかにするため、海外で行われた児童青年期の心理学的剖検の結果の系統的レビューを実施した。また、地域住民の大規模コホートデータを用い、糖尿病の既往を持つ者の自殺リスクを分析した。

（倫理面への配慮）

倫理面への配慮を要する調査を行う場合は、疫学研究に関する倫理指針を踏まえて実施するものとし、必要に応じて研究分担者の所属する機関の倫理審査委員会の承認を得た。

C．研究結果および考察

1）自殺の要因分析体制の確立に関する研究

平成26年度より、CSPと東京都監察医務院による事例検討会・研究打ち合わせをほぼ2ヶ月に1回開催するとともに、検案同行によって東京都監察医務院における実務の流れを踏まえたうえでの、心理学的剖検の実施体制の検討を行った。その結果、平成27年度には、遺族からのコンタクトならびに調査事例数が増加し、CSPと東京都監察医務院の連携による心理学的剖検の実施体制の構築が着実に進んでいることがうかがえた。その背景としては、CSPと東京都監察医務院が定期的に事例検討や研究打合せを開催し、CSPの研究者が検案業務に同行した結果、調査を実施する中で生じる問題点や課題に迅速に対処することができたことが考えられた。今後は、心理学的剖検に携わるマンパワーの確保、ならびにCSP自死遺族サポートチームとの連携を確実に進めていく必要があると考えられた。

2）自殺既遂者の心理社会的特徴に関する研究

「自殺予防と遺族支援のための基礎調査」によって収集された20歳以上の自殺死亡事例（以下、事例群）102例について、性別・年齢・居

住地域を一致させた対照群334例（一般住民生存者）に調査を実施し、収集されたデータを事例群と比較した。調査では、同居者に対して半構造化面接を実施した。その結果、男性では、借金をはじめとする経済的問題の経験率、アルコールに関係する様々な問題の経験率、DSM-IV診断によるアルコール依存症や大うつ病性障害の有病率について、事例群は対照群と比べ有意に高かった。しかし女性では、それらの経験率や有病率について事例群と対照群で有意な差は認められなかった。また、特に若年層では、いじめなどの学校問題や幼少期の親との死別・離別、女性では、幼少期の親との死別・離別に加え家族内でのアルコールの問題が、特に自殺のリスクとなる可能性が示唆された。今後は、剖検調査票の改訂なども視野に入れ、若年層や女性の自殺予防にも資する介入ポイントをさらに詳細に明らかにする必要があると思われた。

3）遺族支援のための情報提供に関する研究
　CSP 自死遺族サポートネットワークと協働して、心理学的剖検研究の外部評価委員会の開催、CSP 自死遺族サポートネットワーク参加者への論文紹介、自死遺族支援者勉強会の開催、一般企業等で利用できるポストベンションリーフレットの作成、自殺予防プログラム評価ツールキットの作成を行った。本研究を通じて、外部評価委員会は、評価を受けた心理学的剖検チームにとっても大きな学びとなり、また外部評価委員として参加した自死遺族支援者・当事者にとっても、貴重な情報を得る機会となった。同時に、心理学的剖検研究の継続にあたっては外部評価委員会の設置は重要かつ必須であると考えられた。今後は、多領域間での協働やコミュニティ単位での取り組み、さらに評価説明といった点で、情報提供の方法をさらに検討していく必要があると考えられた。

4）遺族支援に資する介入法開発に関する研究

本研究では、遺族の支援を目的として作成された冊子「大切な人を自死で亡くされた方へ」の有用性を評価した。その結果、冊子「大切な人を自死で亡くされた方へ」を読んでいない者が意外に多く、その理由としては、心理的に余裕がないこと、他の家族が渡されたため目にしていないということがわかった。自死遺族に接する機会の多い専門家の意見を聴取したところでは、遺族に提供すべき情報としてサポート提供場所の連絡先、各種手続き、活用できる支援に関する情報が挙げられるとともに、遺族ケアとして、一元化された相談窓口の設置が求められていることが示唆された。

また本研究では、遺族の支援に対するニーズを扱った文献のシステマティックレビューも行った。その結果、遺族の支援に関する文献のレビューでは、取り込み基準を満たした論文は12報（ヨーロッパ：6 報、アメリカ・カナダ：5報、オーストラリア：1 報）であり、その内訳は、面接調査が5 報、質問紙調査が4 報、面接調査と質問紙調査を組み合わせたものが2 報、調書調査が1 報であった。以上の論文からは、支援に対して一定以上のニーズがあること、求める支援の内容が多岐にわたることが示唆された。

5）自殺既遂者の検案等に基づく自殺予防研究
　東京都監察医務院が取り扱った東京 23 区の自殺事例の生前情報を記載した検案書類と剖検記録の情報を用いて、若年者の自殺、およびガスを用いた自殺について検討した。その結果、2006 年より 13 年までの8 年間に18 歳未満の自殺例は114 例（M:F=65：49）あり、15 歳未満（28例）と 15 歳以上（86 例）に分けて比較した場合、手段、家庭環境、精神疾患の有無に差があることが明らかにされた。また、ガスを用いた自殺の経年的推移を検討した結果、近年、ヘリウムを用いた自殺が著明に増加していることが明らかにされた。

また、医薬品過量服用による致死事例が処方されていた薬剤の種類を調査し、レセプト情報から東京都内で処方された薬剤の種類との比較を行った。その結果、医薬品過量服薬による死亡事例では、精神科で処方された薬物が直接的な死因となっている場合がほとんどであり、死亡リスクが特に高い薬剤として pentobarbital calcium、 chlorpromazine-promethazine-phenobarbital、 levomepromazine、 flunitrazepam が同定された。

本研究において監察医務院と CSP とが協力することによって、自殺背景の多面的、詳細な解析が可能となった。今後も、法医学、精神医学、心理学など、多方面からの実態把握が重要であると考えられた。

6) 児童青年期の自殺未遂事例の分析

本研究では海外で行われた児童青年期の心理学的剖検の結果を系統的にレビューし、さらにメタ解析を行った。その結果、児童青年期の自殺について心理学的剖検を用いて自殺群と対照群を比較している論文は、6 論文が抽出された。内訳ではアメリカでの報告が 4 件、ヨーロッパ（北欧）での報告が 2 件であった。さらに、これらの論文によれば、児童青年期の自殺においては 15 歳前後を境に自殺に関わる要因に差異がみられ、若年群では、精神科疾患の比率が少なく自殺前の明確なストレス要因や自殺の意図が明確ではないことが特徴とされており、自殺の予防・対策においてより困難なことが予想された。しかし、これらの研究はいずれも異なる仮説に基づいて計画されたために、質の高いメタ解析のための生データがなかった。今後は、心理学的剖検の方法あるいは質問を世界的に統一していく必要があると思われた。

7) 重篤な慢性疾患患者の診療過程における自殺予防に関する研究

本研究では、「多目的コホート研究（JPHC Study）」（主任研究者：津金昌一郎）のデータを用い、糖尿病既往者における自殺・事故による死亡リスクの経年的推移を検討した。その結果、糖尿病既往なし群を基準とした場合の糖尿病既往あり群の自殺・事故全体のリスク比は男女双方で、またベースライン時点で 59 歳以下の層で有意に高かった。本研究の結果は、特に 59 歳以下の糖尿病罹患者における自殺・事故の予防を考えるうえで、糖尿病に伴ううつ病の適切なアセスメントと治療、および糖尿病罹患後の合併症による身体的および認知的な障害に対するサポート・心理社会的ケアの充実が重要であることを示唆するものと考えられた。

D．結論

本研究では、自死遺族を対象とした心理学的剖検調査を中心に、児童青年期の心理学的剖検研究の系統的レビュー、東京都監察医務院の検案資料の分析、大規模前向きコホート等を対象とした自殺の実態分析を行い、効果的な自殺予防対策への示唆を提示した。平成 24 年 8 月に見直しが行われた自殺総合対策大綱では、地域レベルの実践的な自殺対策への転換の必要性、ならびに若年層・自殺未遂者向けの対策の充実が謳われているが、本研究の成果はこれらに寄与するものである。

E．健康危険情報　なし

F．研究発表
　各分担研究報告書に記載

G.知的財産権の出願・登録状況（予定を含む。）
　1．特許取得　　なし
　2．実用新案登録　　　　なし
　3．その他　　　なし

Ⅱ．研究成果の刊行に関する一覧表

別紙4

研究成果の刊行に関する一覧表

書籍

著者氏名	論文タイトル名	書籍全体の編集者名	書　籍　名	出版社名	出版地	出版年	ページ
松本俊彦			自分を傷つけずにはいられない–自傷から回復するためのヒント–	講談社	東京	2015	pp.1-269
松本俊彦			もしも「死にたい」と言われたら 自殺リスクの評価と対応	中外医学者	東京	2015	pp.1-136

雑誌

発表者氏名	論文タイトル名	発表誌名	巻号	ページ	出版年
Suka M, Yamauchi T, Sugimori H.	Relationship between individual characteristics, neighbourhood contexts and help-seeking intentions for mental illness	BMJ Open	5	e008261	2015
Yamauchi T, Inagaki M, Yonemoto N, Iwasaki M, Akechi T, Sawada N, Iso H, Noda M, Tsugane S	History of diabetes mellitus and risk of suicide and accidental deaths in Japan: the Japan Public Health Center-based Prospective Study, 1990-2012	Diabetes & Metabolism			In press
Takeshima T, Yamauchi T, Inagaki M, Kodaka M, Matsumoto T, Kawano K, Katsumata Y, Fujimori M, Hisanaga A, Takahashi Y	Suicide prevention strategies in Japan: A 15-year review (1998-2013)	Journal of Public Health Policy	36(1)	52-66	2015

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3) 山内貴史, 奥村泰之, 白川教人, 松本俊彦, 竹島正	自殺のリスク評価において何に注意すべきか－消防庁および地方自治体の自損行為データから見えてきたこと－	精神科治療学	30(3)	315-320	2015
引地和歌子, 奥村泰之, 松本俊彦, 谷藤隆信, 鈴木秀人, 竹島正, 福永龍繁	過量服薬による致死性の高い精神科治療薬の同定—東京都監察医務院事例と処方データを用いた症例対照研究—	精神神経学雑誌	118	3-13	2016
松本俊彦	自殺念慮のアセスメント－CASEアプローチ－	精神科治療学	30(3)	325-332	2015
松本俊彦	嗜癖的な自傷を呈する子どもの認知行動療法	精神療法	41(2)	59-65	2015
松本俊彦	子どもの自殺と自傷行為	児童青年精神医学とその近接領域	56 (2)	159-167	2015
松本俊彦	自傷と摂食障害	そだちの科学 特集 摂食障害とそだち	25	83-87	2015
松本俊彦	特集 自分を傷つける行為が止まらない人 医療者はどう捉え、かかわればいいのか この分野の援助者は、知恵とスキルを共有し、仲間を作る必要がある	精神看護	18 (6)	540-544	2015
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成重竜一郎，川島義高，澤谷篤，齊藤卓弥，大久保善朗	救命救急センターにおける若年自殺未遂者の特徴	児童青年精神医学とその近接領域	56（2）	179-189	2015
齊藤卓弥	DSM-5による児童思春期精神科医療へのインパクト	精神医学	57（8）	620-623	2015
齊藤卓弥	DSM-5と成人期ADHDの適性診断について	精神神経学雑誌	117（9）	756-762	2015
辻井農亜、泉本雄司、宇佐美政英、岡田俊、齊藤卓弥、根来秀樹、飯田順三	児童青年期患者に対する向精神薬の適応外使用についての意識調査	児童青年期精神医学とその近接領域	56（2）	220-235	2015
齊藤卓弥	重篤気分調節症	精神科治療学	30増刊号	90-92	2015
齊藤卓弥	児童・思春期のうつ病	精神科治療学	30増刊号	121-123	2015

Ⅲ．研究成果の刊行物・印刷

BMJ Open Relationship between individual characteristics, neighbourhood contexts and help-seeking intentions for mental illness

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ABSTRACT

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

Design, setting and participants: A cross-sectional web-based survey was conducted among Japanese adults aged 20–59 years in June 2014. Eligible respondents who did not have a serious health condition were included in this study (n=3308).

Main outcome measures: Participants were asked how likely they would be to seek help from someone close to them (informal help) and medical professionals (formal help), respectively, if they were suffering from serious mental illness. Path analysis with structural equation modelling was performed to represent plausible connections between individual characteristics, neighbourhood contexts, and 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 an informal help-seeking intention that was directly associated with a formal help-seeking intention. Those living in a communicative neighbourhood, where neighbours say hello whenever they pass each other, were significantly more likely to express informal and formal help-seeking intentions. Those living in a supportive neighbourhood, where neighbours work together to solve neighbourhood problems, were significantly more likely to express an informal help-seeking intention. Adequate health literacy was directly associated with 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.

Conclusions: The results of this study bear out the hypothesis that neighbourhood context contributes to help-seeking intentions for mental illness. Living in a neighbourhood with a communicative atmosphere and having adequate health literacy were acknowledged as possible facilitating factors for 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 neighbourhood factors. This study represents the first attempt to elucidate multifactorial mechanisms for help-seeking using structural equation modelling.
- Our final structural equation model illustrated the pathways linking individual and neighbourhood factors to informal and formal help-seeking intentions, and bore out the hypothesis that neighbourhood 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 participants 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 WHO 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 socioecological perspective acknowledges that health behaviour is influenced by the social environment.[4] While the proximal cause of health behaviour lies within the individual rather than in the social environment, changes in the social environment will

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produce changes in individuals. Similarly to other health behaviours, 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 neighbourhoods in which we live and the policies we create to order our lives.[6] Neighbourhood is the next smallest social unit after family, in which face-to-face interactions occur among members. Previous studies have revealed that neighbourhood context, or more specifically neighbourhood social capital, is associated with health behaviours such as smoking, drinking, diet and physical activity.[7] The impact of neighbourhood context on health behaviour may be worth considering when developing public health strategies for encouraging help-seeking. Unfortunately, to the best of our knowledge, there have been no studies examining to what extent neighbourhood context contributes to help-seeking and what factors are responsible for the neighbourhood effect. Little is known about the role of the neighbourhood in the help-seeking process.

The aim of this study was to determine the relationship between individual characteristics, neighbourhood contexts and help-seeking intentions for mental illness. On the basis of a review of the literature, we created a hypothesis model linking individual and neighbourhood 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 modelling was performed to test the hypothesis model and to elucidate the role of neighbourhood in the help-seeking process. We believe the findings of this study will provide a new direction for
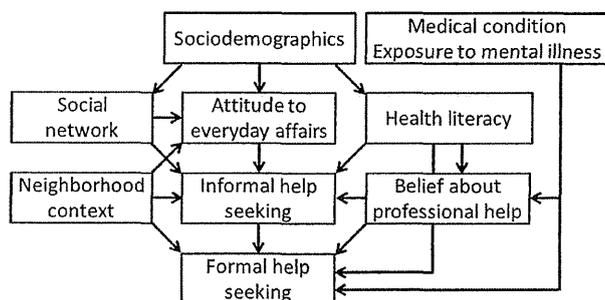
public health strategies for encouraging help-seeking or suicide prevention policies.

METHODS
Participants
A cross-sectional web-based survey was conducted in June 2014 among Japanese adults aged 20–59 years who lived in four prefectures, Chiba, Niigata, Nagano and Fukuoka, in Japan. Medical professionals and students were excluded from recruitment because their attitudes to help-seeking are seen as different from those of the larger population.

An online research company (INTAGE, Inc, Tokyo, Japan) was contracted to create web questionnaire forms and to collect anonymous responses (n=3200). The company has a nationwide research panel of 1.2 million registrants. At the time of the survey, those registrants aged 20–59 years who lived in the four prefectures and were not medical professionals or students, totalled 46 258 (20 071 males and 26 187 females). Recruitment emails were sent to 8721 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 3365 responses were obtained over 8 days of recruitment. Of these, 6 participants reported having serious health conditions and 51 participants provided incomplete or inconsistent answers to questions. The remaining 3308 participants were finally included in the study.

Table 1 shows the characteristics of the study participants. 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 those 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 neighbourhood 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 be to 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

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

Table 1 Characteristics of the study participants

	N	Per cent
Gender		
Male	1621	49.0
Female	1687	51.0
Age, years		
20–29	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 US$10 000 at the time of the survey.

suffering serious mental illness. Those who gave affirmative responses on a four-point scale (certainly yes/probably yes/probably not/certainly not) 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, dyslipidaemia, stroke, heart trouble, renal failure, cancer, insomnia, depression and others.

Exposure to mental illness
Participants were asked about their psychiatric history—whether they had ever consulted health professionals about their mental health. The Reported and Intended Behaviour Scale (RIBS)[10] was used to determine the extent of participants' contact with people who were

mentally ill. The first subscale consists of four questions: living with, working with, living near 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 five items for functional literacy, five items for communicative literacy and four 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 per cent do you think are helped? (range 0–100%); (2) of those with serious mental illness who do not get professional help, what per cent 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 trichotomised 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 three items for family ties and three 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 be to talk with someone close to them about a 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 not/certainly not) were considered as having a tendency to consult about everyday affairs.

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

	N	Informal sources			Formal sources		
A. Sociodemographics							
Gender							
Male	1621	967	59.7%	<0.001	1170	72.2%	<0.001
Female	1687	1274	75.5%		1330	78.8%	
Age, years							
20–29	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							
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							
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							
Social network (LSNS-6)							
Low	1891	1120	59.2%	<0.001	1360	71.9%	<0.001
High	1417	1121	79.1%		1140	80.5%	

Continued

4

Table 2 Continued

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

*One million yen was about US$10 000 at the time of the survey.

Participants were also asked whether they felt reluctant to get help from others.

Neighbourhood context

A variety of measures of neighbourhood context have been proposed, but none of them is recommended as a gold standard. Neighbourhood is characterised as a geographically localised 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 neighbourhood context relevant to neighbourhood social capital were assessed using the following statements, respectively: (1) neighbours say hello whenever they pass each other (communicativeness); (2) neighbours trust in each other (trustfulness); (3) neighbours help each other (helpfulness); and (4) neighbours work together to solve neighbourhood 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 dichotomised into positive (strongly agree/agree) and negative (not sure/disagree/strongly disagree).

Statistical analysis

The percentages of participants who expressed help-seeking intentions were compared using χ^2 test. Significant variables on the univariate analysis were incorporated into a multiple logistic regression model to identify individual and neighbourhood factors independently associated with help-seeking intentions. Adjusted ORs and 95% CIs were calculated from the models.

Path analysis with structural equation modelling was performed to test the hypothesis model linking individual and neighbourhood 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. A formal help-seeking intention was therefore placed in the structural equation model as the outcome variable. On the basis of previous studies,[5] [16-18] an 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 standardised regression weight (ie, path coefficient, β). While there are no established guidelines regarding sample size requirements for structural equation modelling, 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 3308 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 V.9.4 software (SAS Institute, Cary, North Carolina, USA). The path analysis was performed

using IBM SPSS Amos V.22.0 (IBM Corp, Armonk, New York, USA). Significant levels were set at p<0.05.

RESULTS

Table 2 shows the percentages of participants who expressed the help-seeking intentions for mental illness. Of the 3308 participants, 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 informal and formal help-seeking intentions. All the individual (A, B, C, D) and neighbourhood (E)

factors showed significant associations with either or both informal and formal help-seeking intentions in univariate analyses. Contrary to theoretical expectations, help-seeking intentions were more frequently observed in those who reported embarrassment towards professional help. This factor was considered irrelevant and removed from further analysis.

Table 3 shows the results of multiple logistic regression analysis. The following three individual and one neighbourhood factor were significantly associated with informal and formal help-seeking intentions: contact with people with mental illness, health literacy, perceived effectiveness of professional help, tendency to consult

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 neighbourhood						
Yes	1.30*	1.06	1.58	1.78***	1.45	2.18
Trustful neighbourhood						
Yes	0.91	0.68	1.21	0.91	0.67	1.24
Helpful neighbourhood						
Yes	1.17	0.88	1.56	1.18	0.87	1.61
Cooperative neighbourhood						
Yes	1.50***	1.18	1.89	1.22	0.96	1.56

*p<0.05, **p<0.01, ***p<0.001.

about everyday affairs and communicative neighbour-hood. Besides these, marital status, social network and cooperative neighbourhood, were significantly associated with an informal help-seeking intention, while medical condition and psychiatric history were significantly associated with a formal help-seeking intention. The highest ORs for 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 to 0.075). An informal help-seeking intention had the greatest direct effect on a formal help-seeking intention. Besides this, psychiatric history, health literacy, perceived effectiveness of professional help and communicative neighbourhood had a direct effect on a formal help-seeking intention. Tendency to consult about everyday affairs and cooperative neighbourhood had an indirect effect on a formal help-seeking intention through its effect on an informal help-seeking intention.

DISCUSSION

Causal effect of neighbourhood context, or neighbourhood effect, has been reported on various health outcomes including mental illness, whereas the methodology for estimating neighbourhood effects, including definitions of neighbourhood, measures of neighbourhood context and analytical models, varies widely across studies.[21][22] In the absence of established methodology, this study examined four specific features of neighbourhood context relevant to neighbourhood 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 neighbourhood factors. Moreover, to date, there have been few attempts to elucidate multifactorial mechanisms for help-seeking using structural equation modelling. This is the first study to illustrate the pathways linking individual and neighbourhood factors to informal and formal help-seeking intentions and bore out the hypothesis that neighbourhood context contributes to help-seeking intentions for mental illness.
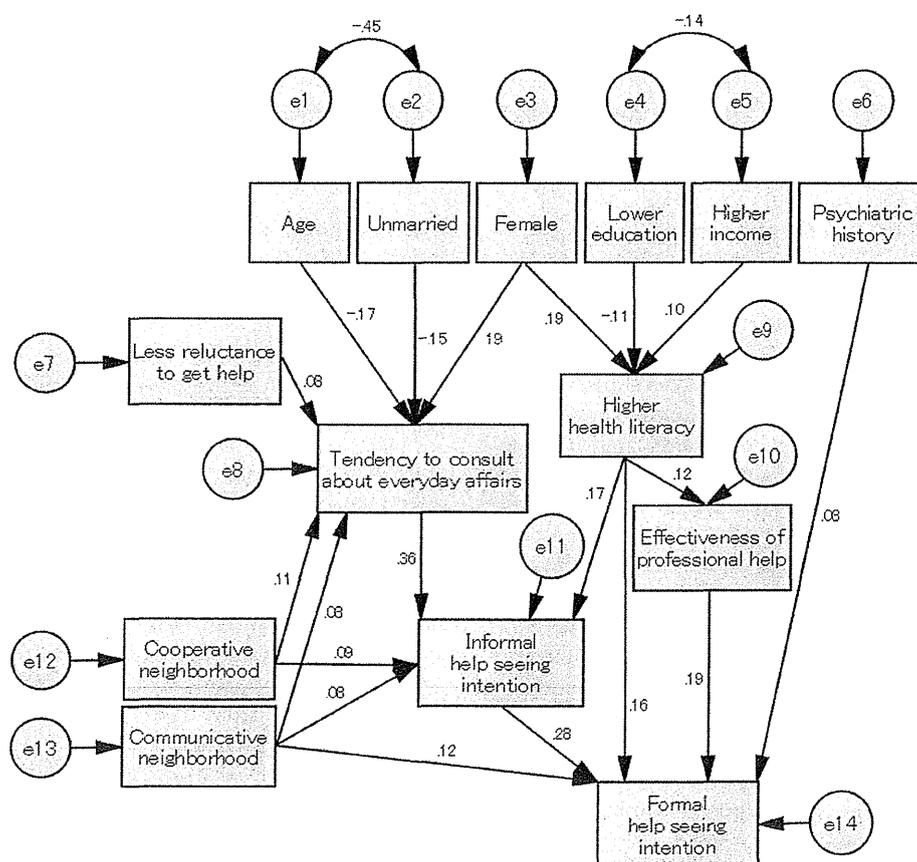

Figure 2 Path diagram for help-seeking intentions for mental illness. Rectangles were observed variables. Ellipses were latent variables. Values on the single-headed arrows were standardised regression weights. Values on the double-headed arrows were correlation coefficients. Model fitness: GFI 0.946; AGFI 0.918; RMSEA 0.072 (90% CI 0.068 to 0.075). AGFI, adjusted goodness of fit index; GFI, goodness of fit index; RMSEA, root mean square error of approximation.