Implementation of gatekeeper training programs for suicide prevention in Japan: a systematic review

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Abstract
Background: Suicide is a critical global health issue. Japan has had a high suicide rate for the last 12 decades. In 2007, the Japanese Central Government Office issued the "General Principles of Suicide Prevention Policy". An important component of this policy was the gatekeeper training (GKT) program. GKT is a widely recommended suicide prevention intervention. This study aimed to investigate the association between the announcement of the national suicide prevention policy and implementation of GKT programs in Japan.

Methods: We performed a systematic review of public documents from central and local governments and research literature using three Japanese databases and PubMed. Characteristics of eligible reports and the report quality of local government information were summarized.

Results: All local governments provided information about GKT activities. Over 80% of local governments had specific GKT webpages, but useful localized information and program evaluations were limited. Our literature search identified 122 eligible reports. The number of reports increased markedly from 2011 to 2014. However, few of the reviewed research studies used validated outcome measures.

Conclusions: The announcement of the national suicide prevention policy increased the implementation of GKT programs in Japan. However, there remains a need for integration of knowledge and evaluation of GKT programs.

Keywords: Suicide prevention, National policy, Gatekeeper program, Implementation, Japan

Background
Suicide is a critical global health issue. Japan is a developed country and has had a high suicide rate for the last 12 decades. The suicide rate per 100,000 people remained high following a marked nationwide increase in 1998 (suicide rate 26.1) that lasted until 2011. Although the suicide rate decreased after 2011, it was still high (16.7 per 100,000 people) in 2017. Therefore, suicide remains a priority mental health issue in Japan [1].

A systematic review by Mann et al. [2] included gatekeeper training (GKT) programs as one of five recommended suicide prevention strategies. The term "gatekeeper" refers to people who have primary contact with individuals at risk for suicide, and who can identify such individuals by recognizing suicidal risk factors. GKT "teaches specific groups of people to identify people at high risk for suicide and then to refer those people for treatment" [3]. GKT is often integrated into suicide prevention strategies aimed at educating social and community facilitators to identify signs of suicidal behavior and refer individuals to appropriate services [4].

In some countries, suicide prevention strategies and activities focus on increasing access to mental health services for vulnerable people via general practitioners. In contrast, prevention strategies in Japan are unique in that they emphasize public awareness of suicide and social and economic factors related to suicide prevention. Japan has adopted a comprehensive approach to suicide prevention that involves healthcare and non-healthcare sectors [5].
In 2007, the Japanese Cabinet Office released the “General Principles of Suicide Prevention Policy.” This national policy recommended the use of GKT programs for suicide prevention, as these programs can be integrated into existing strategies. The policy suggested that GKT programs should be provided to various groups, such as general physicians, teachers, public health nurses, long-term care support specialists, local welfare commissioners, child welfare volunteers, and local public health officers. Evidence suggests that GKT programs for suicide prevention are effective for increasing knowledge, building skills, and molding trainees’ attitudes. GKT programs have been implemented and tested with several different populations, including schools and minority groups [3]. Implementation of GKT has been led by Japan’s Ministry of Health, Labour and Welfare (MHLW), with local authorities expected to implement and be primary coordinators for GKT programs. A special fund is available to support this function. Previous studies have reported the impact of the policy on overall suicide rates [5–8]. This study aimed to investigate the association between the announcement of the national suicide prevention policy and implementation of GKT programs in Japan.

Methods
We were unable to find a comprehensive registered database or list of activities about GKT in Japan; therefore, we used two methods to systematically review GKT implementation. First, we systematically searched public documents from central and local governments for any mention of GKT [9, 10]. This was because local authorities are responsible for planning and conducting GKT programs based on the national suicide prevention policy. These documents covered 47 prefectures and 20 major designated Japanese cities with high populations and other public resources. We also examined and evaluated websites and published documents linked to central and local government and other public institutions, such as non-governmental organizations (NGOs), for information about GKT [10, 11]. Most information was collected from public domain websites and Google searches. The search terms were “suicide,” “gatekeeper,” or the name of the local government. If necessary, we contacted institutions to obtain information. Information was accessed up to July 2018. We evaluated the information collected using eight criteria developed for this study: (1) specific webpages, (2) leaflets developed by local government, (3) training textbooks and materials developed by local government, (4) additional materials developed by local government, (5) local government-registered activities, (6) local government activity notices, (7) local government activity case reports, and (8) evaluations of these activities. We calculated the frequencies of the types of information provided by prefectures and major designated cities. Table 1 shows the characteristics of the information provided on GKT.

Second, we searched for articles on GKT up to July 2018 using three Japanese literature databases: Ichushi, a Japanese medical journal database (http://www.jamas.or.jp/); Cinii, a database of academic information about articles, books, journals, and dissertations in Japan (https://ci.nii.ac.jp/); and Google Scholar in Japanese. We also searched PubMed in English. We considered articles that represented an index of the implementation of GKT programs. The English keywords and formulae used in the search were: (suicid*) OR (self-harm*) OR (selfharm*) OR (self-poison*) OR (selfpoison*) OR (overdose*) OR (over-dose*) OR (self-injur*) OR (selfinjur*) OR (self-mutilation*) OR (selfmutilation*) OR (automutilation*) OR (auto-mutilation*) OR (self-destructive*) OR (seldistributive*) AND (gatekeeper*). The Japanese keywords and formulae used were: (jisatsu) OR (jishou)
OR (jikohakai koudou) OR (jison) OR (kishinenryo) AND (gatekeeper). Eligible criteria were reports on any activities and evaluations of GKT programs for suicide prevention in Japan that contained “gatekeeper” and related terms. All types of reports were eligible, including conference and review papers. We classified report characteristics and calculated frequencies and percentages of the information provided (Table 2, Figs. 1, 2). This review was reported in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement (Additional file 1).

Results
Central government information
The website search identified GKT webpages by Japan’s MHLW that provided a sample handbook, a sample textbook on training, and video lectures. The relevant central government webpages also provided the names of staff members who offered lectures on GKT. From these websites, we extracted 228 case series reports of local government activities related to suicide prevention from 2012 to 2015 and 31 eligible cases of GKT from 14 prefectures.

Local government information
Our review identified different types of information on GKT provided by local governments (Table 1). All local governments had information about GKT activities, and over 80% had specific webpages about GKT. Useful and

| Target population                  | n (%) |
|-----------------------------------|-------|
| Lay persons                       | 14 (11.5) |
| Public sector workers             | 27 (22.1) |
| Private sector workers            | 3 (2.5) |
| Schools                           | 16 (13.1) |
| Clinics and hospitals             | 6 (4.9) |
| Health centers                    | 12 (9.8) |
| Pharmacies                        | 24 (19.7) |
| Internet and SNS users            | 6 (4.9) |
| Other                             | 14 (11.5) |

| Report type                       |       |
|-----------------------------------|-------|
| Review                            | 54 (44.2) |
| Original article                  | 28 (23.0) |
| Conference paper                  | 40 (32.8) |

| Publication language              |       |
|-----------------------------------|-------|
| Japanese                          | 117 (95.9) |
| English                           | 5 (4.1) |

Fig. 1 Flow chart of the literature search
localized information was provided by 15 prefectures (31.9%) and three cities (15.0%), which included a sample of a leaflet developed by the local government. In addition, 12 prefectures (25.5%) and two cities (10.0%) provided a sample of a training textbook developed by the local government, and 15 prefectures (31.9%) and five cities (10.6%) provided additional materials developed by local government. Unfortunately, few local government activity and evaluation reports were available. We also found that more than 20 NGOs conducted GKT. These NGOs provided GKT programs and sometimes collaborated with local governments. Some local governments contributed financial resources to NGO GKT programs.

Published research
The literature search identified 424 studies: Ichushi n = 115, Cinii n = 51, Google Scholar (in Japanese) n = 245, and PubMed (in English) n = 13. There were 122 eligible studies after removing duplicates and excluding those that did not discuss GKT for suicide prevention (Fig. 1). The target populations of the reviewed studies varied (as indicated in the national suicide prevention policy): public sector workers, private sector workers, bar keepers, pharmacists, teachers, university officers, general physicians, nurses, mental health providers, and Internet and SNS users (Table 2). A variety of programs were conducted to train anyone who was able to recognize and refer someone at risk of suicide. Most programs had been developed based on MHLW information. The number of eligible studies increased between 2011 and 2014 (Fig. 2). Most were reports of activities rather than comparison studies that evaluated outcomes. Few studies used validated Japanese outcome measures, such as the Suicide Intervention Response Inventory [12], the Attitudes toward Suicide Scale [13], or the Gatekeeper Self-Efficacy Scale [14].

Discussion
Findings
Our study demonstrated that the announcement of a national suicide prevention policy increased the implementation of GKT programs in Japan. The policy announcement was strongly associated with the number of publications reporting GKT programs. This suggests that the policy announcement led to positive changes in GKT implementation; however, there was little evidence of the integration of knowledge and evaluation of programs.

Implementation status and related issues
There is substantial political support for GKT implementation. In Japan, suicide prevention was promoted by a basic act for suicide prevention in 2006, a policy in 2007 outlining general principles of suicide prevention, and the establishment of a special fund for local government programs. These measures led to the development of a comprehensive and multi-sector approach to suicide
prevention. Their effectiveness is illustrated by the consistent decrease in the number of suicides since 2011 [5–8]. GKT is a core component of suicide prevention strategies and has been widely implemented in Japan.

Strong collaboration between the public sector and NGOs is an important part of the implementation of GKT programs, and some prefectures and cities closely collaborated with NGOs. Many suicide prevention activities were conducted by NGOs, and information about some of these activities was not available on local government websites. However, local governments provided some financial incentives and resources to support NGOs in providing GKT programs. In addition, some prefectures had a major designated city; in those prefectures, the suicide prevention role was allocated to a local authority. This is consistent with previous research that identified collaboration between NGOs and some local governments on suicide prevention in Japan [5].

Local governments provided limited information about evaluation and feedback of GKT programs. Only a small number of local government websites provided numbers of registered members, and few MHLW case report collections were provided on local government webpages. Only a few prefectures examined public awareness of GKT as part of questionnaire surveys on suicide prevention and mental health. Some research publications used pre–post designs for outcome evaluation. Although most studies reported positive effects of GKT, there was substantial variation in outcomes and some studies used ad hoc self-developed measures.

Limitations
The study had some limitations. First, our review of websites and public documents may not have identified all GKT activities in Japan. Second, some sources may have used alternative terms for “gatekeeper” (which was one of our search terms) that were more user-friendly and attractive to the public. Additionally, some so-called GKT programs only consisted of a lecture on mental health or psychiatric information, such as a classroom lecture of 1–2 h. Other community interventions comprised multimodal programs, and it was difficult for us to isolate the GKT program (which might not have been categorized as such). Third, many programs were independently provided by small local town council offices, making it difficult to obtain a comprehensive overview of the provision of GKT programs. Fourth, some of the reports might have been misclassified, especially as some activities were multimodal or comprehensive community interventions. Fifth, we could not evaluate the outcomes of the implemented GKT programs. Our review of published scientific research found limited evidence of the short-term effects of GKT and no clear confirmation or validation of common outcomes. More studies are needed to develop databases to share knowledge and outcomes and monitor the quality of GKT programs.

Conclusions
The announcement of a national suicide prevention policy increased the implementation of GKT programs in Japan. However, there remains a need for integration of knowledge and evaluation of GKT programs.

Additional file

Additional file 1. PRISMA checklist.

Authors’ contributions
NY was responsible for the study concept and design. NY also performed the review, analysis and drafted the manuscript. YK and KE performed the review, contributed to writing the manuscript and provided critical review. MY contributed to writing the manuscript and provided critical review. All authors read and approved the final manuscript.

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Competing interests
The authors declare that they have no competing interests.

Availability of data and materials
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Not applicable.

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References
1. Cabinet Office, Government of Japan. Jisatsu-Taisaku Hakusyo. Tokyo: Cabinet Office, Government of Japan; 2018 [Japanese].
2. Mann JJ, Apter A, et al. Suicide prevention strategies: a systematic review. JAMA. 2005;294(16):2064–74.
3. Isaac M, Elias B, Katz LY, Belik SL, Deane FP, Enns MW, et al. Gatekeeper training as a preventative intervention for suicide: a systematic review. Can J Psychiatry. 2009;54:260–8.
4. Cross W, Matthieu MM, Lezine D, Knox KL. Does a brief suicide prevention gatekeeper training program enhance observed skills? Crisis. 2010;31(3):49–59.
5. Takeshima T, Yamauchi T, Inagaki M, Kodaka M, Matsumoto T, Kawanoto K, et al. Suicide prevention strategies in Japan: a 13-year review (1998–2013). J Public Health Policy. 2015;36(1):52–66.
6. Nakanishi M, Yamauchi T, Takeshima T. National strategy for suicide prevention in Japan: impact of a national fund on progress of developing systems for suicide prevention and implementing initiatives among local authorities. Psychiatry Clin Neurosci. 2015;69(1):55–64.
7. Nakanishi M, Endo K, Ando S. The Basic Act for Suicide Prevention: effects on longitudinal trend in deliberate self-harm with reference to national suicide data for 1996–2014. Int J Environ Res Public Health. 2017;14(1):E104.
8. Nakanishi M, Endo K. National suicide prevention, local mental health resources, and suicide rates in Japan. Crisis. 2017;38(6):384–92.
9. The website lists of suicide prevention by local governments. https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/hukushikaigo/shougaihukushikaigojisatsu/local_gov_link.html. Accessed 15 July 2018 (Japanese).
10. The website of collection of suicide prevention activity by local governments. https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/0000134737.html. Accessed 15 July 2018 (Japanese).
11. The website lists of NGO consultation activities for suicidal issues by e-mail and SNS. https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/0000188968.html. Accessed 15 July 2018 (Japanese).
12. Kawashima D, Kawano K. The validity of the Japanese version of the suicide intervention response inventory. J Men Health. 2013;26:67–74.
13. Kodaka M, Inagaki M, Poštuvan V, Yamada M. Exploration of factors associated with social worker attitudes toward suicide. Int J Soc Psychiatry. 2013;59(5):452–9.
14. Morita N, Tachikawa H, Endo G, Alba M, Shiratori Y, Arai T. Development of a suicide prevention gatekeeper self-efficacy scale (GKSES). Rinsho Seishin Igaku. 2015;44(2):287–99 (Japanese).