

Long-Term Effects of a Screening Intervention for Depression on Suicide Rates among Japanese Community-Dwelling Older Adults

Hirofumi Oyama, M.D., Tomoe Sakashita, Ph.D.

Objectives: To explore the long-term impact of a universal screening intervention for depression on suicide rates among older community-dwelling adults, with gender as an effect modifier. **Design:** Controlled cohort study reporting long-term follow-up of previous research. **Setting:** Two sets of three municipalities in Japan were assigned as intervention and control regions and compared with the surrounding zone and prefecture. **Participants:** Intervention area residents aged 60 years and older (14,291) were invited to participate in a 2-year intervention (2005–2006). Four population-based dynamic cohorts of residents aged 65 years and older (1999–2010) were included as subjects, 6 years before and after the intervention started. **Intervention:** At-risk residents within the intervention region (4,918) were invited for a two-step screening program; 2,552 participated in the program linked with care/support services for 2 years. An education program open to the public was held. **Measurements:** Changes in suicide from a 6-year baseline to the 2-year intervention and a 4-year follow-up in the intervention region (11,700 adults ≥ 65 years) were compared with a matched control and two comparison areas using mixed-effects negative binomial regression models. Suicide rates among older adults exposed to screening were compared with those of the control region. **Results:** Suicide rates in the intervention region decreased by 48%, which was significantly greater than in the three comparison areas. The program's benefits lasted longer for women than men. Screening exposure may be associated with decreased suicide risk over the 4-year follow-up. **Conclusions:** Universal screening may decrease suicide rates among older adults, with potential gender differences in treatment response. (Am J Geriatr Psychiatry 2015; ■■:■■-■■)

Key Words: Suicide, community, older adults, depression screening, intervention

Received April 2, 2015; revised October 5, 2015; accepted October 13, 2015. From the Department of Social Welfare, Faculty of Health Sciences, Aomori University of Health and Welfare, Aomori, Japan. Send correspondence and reprint requests to Hirofumi Oyama, Professor, Department of Social Welfare, Faculty of Health Sciences, Aomori University of Health and Welfare, 58-1 Mase, Hamadate, Aomori 030-8505, Japan. Email: h_oyama@auhw.ac.jp

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Effects of a Depression Screening on Suicide Rates

In many countries, individuals aged 65 years and above (*older adults*) have a higher risk of suicide than other age groups.¹⁻³ Reviews of observational studies^{4,5} and recent psychological autopsy studies⁶ have indicated that depression is common among older adults who die by suicide. Furthermore, suicide among older adults may be associated more with depression than suicide at any other ages.⁷ Depression is treatable but often undetected.^{8,9} In Japan, previous studies have indicated that fewer than 25% of those with depression seek medical treatment.^{10,11} Regular check-ups for older adults include a frailty checklist that contains some items from a depression-screening questionnaire, although this is not effective for detecting depression in those without physical disabilities.¹²

Early detection and treatment can lead to better depression outcomes^{13,14} and suicide prevention¹⁵ in both institutional and community settings.¹⁶⁻¹⁸ Screening programs to identify depressed adults and direct them toward treatment have been shown to have positive long-term effects on suicide risk among older adults.^{6,19} Annual universal screening programs for late-life depression, combined with care support for older adults and public health education, have been associated with lower rates of suicide over 5-year implementation periods in rural Japanese communities with high suicide rates.¹⁷

Recent observations suggest that a program of improved depression management can provide long-term benefits for older adults. A 2-year collaborative program showed an 8-year effect on mortality risk²⁰ and a 1-year quality improvement program had a 5-year effect on depression prevalence.²¹ Our previous study of an intervention delivered between January 2005 and December 2006 to older Japanese community dwellers showed lower risk of suicide among men during the 2-year implementation period than the preceding period.²²

Despite these reports of suicide reduction, however, the longer-term effects of such interventions remain unclear. Gender differences in suicide risk,^{4,5} use of mental health services,²³ and response to depression treatment²⁴ are confounders that might influence outcomes. We aimed to verify the long-term effects of universal depression screening and the efficacy of a subsequent care program. Based on long-term outcomes from studies focused on depression management,^{20,21} we hypothesized that a 2-year community-based intervention, comprising public ed-

ucation programs plus universal depression screening and care support in target areas, would reduce suicide rates among older adults, even 4 years post program. We also predicted that gender would be an effect modifier.

METHODS

Design and Subjects

The study focused on four geographically defined, population-based dynamic cohorts of older adults. We compared the cohort that had undergone a 2-year intervention with three control cohorts before and after the intervention. The initial study of an intervention program (running from 2005 to 2006) targeted Japanese adults aged 60 years and older and compared the suicide rate of this group with the overall death rate for Japanese people in this age range.²² The present research targeted participants of the initial study for inclusion; these participants were now considered "older adults" of at least 65 years of age, and were exposed to potential long-term effects of the initial 4-year intervention, ending in 2010. The present study analyzed the 2-year intervention period (2005–2006) and 4-year follow-up period (2007–2010) as part of the post-implementation period (2005–2010). The full study period (1999–2010), including pre-implementation (1999–2004) and post-implementation assessments, was characterized by an increased risk of suicide in older adults and more generally across the Japanese population, possibly linked to the 1998 Asian economic crisis.²⁵

Settings and Locations

The participating regions included three municipalities within the Hachinohe Medical Zone and three within the Kamitosan Medical Zone, as shown in [Figure 1](#). Situated approximately 20 km apart, the regions were matched for town size, rural status, and suicide rates. Both medical zones are located in Aomori Prefecture in northern Japan, which had the second highest suicide rate in Japan from 2002 to 2004. Hachinohe and Kamitosan each had higher suicide rates among older adults than the national average for 1999–2004: 52.7 and 66.1 per 100,000, respectively, compared with 37.2.²⁶

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