ORIGINAL PAPER

Nagoya J. Med. Sci. **84**. 301–310, 2022
doi:10.18999/nagjms.84.2.301

Recurrence of Overdose Suicide Attempt index: a novel scoring system for predicting the recurrence of intentional overdose

Masayuki Hirose[1], Daisuke Kasugai[2], Kousuke Tajima[3], Hiroshi Takahashi[4], Shigeki Yamada[1] and Akihiko Hirakawa[5]

[1]*Department of Clinical Pharmacy, Fujita Health University, Toyoake, Japan*
[2]*Department of Emergency and Critical Care Medicine, Nagoya University Graduate School of Medicine, Nagoya, Japan*
[3]*Department of Emergency Medicine, Fujita Health University, Toyoake, Japan*
[4]*Department of Division of Medical Statistics, Fujita Health University, Toyoake, Japan*
[5]*Department of Disaster Medicine and Traumatology, Fujita Health University, Toyoake, Japan*

ABSTRACT

Repeated suicide attempts through intentional overdose are not infrequent, but little is known about the risk factors associated with intentional overdose. We investigated these risk factors within 1 year of discharge from hospital and developed an index predicting recurrence. This retrospective observational study included 419 patients admitted to our hospital between 2011 and 2018 due to intentional overdose. Of these, 43 (10.0%) repeated an overdose within 1 year of discharge. The risk factors with the highest odds ratios from multivariate logistic regression analyses were used to develop an index assessing Recurrence of Overdose Suicide Attempt. The following variables were significantly associated with recurrence and were included in the index: anxiety and/or insomnia at discharge; use of five or more psychotropic medications; diagnosis of an ICD-F4 anxiety disorders; and female sex (odds ratios: 4.24; 5.52; 2.41; and 3.41, respectively). The area under the receiver operating characteristic curve of the index was 0.797. Sensitivity, specificity, and positive and negative predictive values for Recurrence of Overdose Suicide Attempt >4 points (out of 6) were 72.1%, 75.8%, 25.4%, and 96.0%, respectively. Our novel index predicted the recurrence of intentional overdose with a good negative predictive value and may therefore be a useful screening tool for this high-risk population.

Keywords: anxiety, insomnia, observational study, recurrence, suicide

Abbreviations:
ICD-10: International Classification of Diseases, 10th revision
ROSA: Recurrence of Overdose Suicide Attempt index

Received: February 24, 2021; accepted: August 10, 2021
Corresponding Author: Daisuke Kasugai, MD
Department of Emergency and Critical Care Medicine, Nagoya University Graduate School of Medicine, 65 Tsurumai-cho, Showa-ku, Nagoya 466-8550, Japan
Tel: +81-52-744-2659, Fax: +81-52-744-2659, E-mail: dkasugai@med.nagoya-u.ac.jp

INTRODUCTION

Suicide is a major social and medical concern in Japan owing to its higher rates when compared with other major industrialized nations.[1] The incidence of suicide attempts is reported as being more than 10 times that of suicide,[2] imposing a significant economic and medical burden on emergency medicine settings. Among attempts, intentional drug overdose is the most prevalent type of suicide attempt requiring hospital admission.[3]

In recent years, intentional drug overdose has become a widely used method for attempting suicide and a serious issue in Japan.[4,5] According to a nationwide survey, the proportion of suicide attempts involving intentional overdose has more than doubled in the last decade.[6] The recurrence of intentional overdose has been reported at 17%–38%,[7-10] but little is known about associated risk factors. Historically, the SAD PERSONS and Beck Hopelessness Scales have been used as screening tools for suicide risk.[11,12] However, no simple scoring method exists to predict the recurrence of suicide attempts specifically due to overdose. Therefore, there is a requirement to develop a screening tool to evaluate the risk of recurrence so individuals at high risk are identified.

We investigated the risk factors for the recurrence of an intentional overdose within 1 year of discharge and developed a scoring system to predict recurrence.

METHODS

Study setting and patients

This retrospective observational study included patients admitted to Fujita Health University Hospital between 2011 and 2018 due to intentional drug overdose. The hospital is a tertiary medical center in Toyoake City and is the largest hospital in Japan. Patients were excluded if their suicide attempt combined an overdose with other means, eg, fall, burning, or carbon monoxide poisoning. Intentional drug overdose was defined as the intentional self-administration of more than twice the prescribed dose of a medicine and/or over-the-counter drug at one time.[7] Recurrence was defined as a repeated episode of an intentional overdose that required hospitalization within 1 year of discharge.[7] Recurrence was identified from medical records when patients transferred to the hospital. As the hospital is the only tertiary medical center in the area, all patients in the area who called an ambulance for an intentional overdose were transferred to our hospital.

Patients were admitted via the emergency department and initially treated by emergency physicians. When the patient was awake and could talk, they were seen by a psychiatrist. Discharge and follow-up plans were decided by emergency physicians and psychiatrists.

Study data

Data were collected retrospectively from electronic medical charts and included the patient's age, sex,[13] past medical history (psychiatric disorders),[7] number of combinations of psychotropic medications,[14-16] any previous suicide attempts within 5 years,[8] whether there was an organized suicide plan for the patient,[17] the presence of anxiety and/or insomnia at discharge,[18] and whether the patient had family and/or social support. We considered patients with an organized suicide plan when they persistently thought of death and planned to collect medication for overdose and/or when psychiatrists judged not impulsive. The diagnosis of any psychiatric disorder was classified according to the International Classification of Diseases, 10th revision (ICD-10).[19]

Statistical analysis and index development

Continuous variables were presented as the mean ± standard deviation or median with interquartile ranges, depending on their distributions. Categorical variables were summarized as n (%). The univariate analysis of differences between recurrence and non-recurrence groups used two-tailed unpaired t-tests for continuous variables and chi-square tests for discrete variables. Logistic regression analysis models were used to assess factors significantly associated with the recurrence of intentional overdose. Variables that were statistically significant and psycho-socially plausible were entered into a logistic multivariable model. Variables that were statistically significant in the multivariate logistic regression analysis were combined to develop an index for predicting recurrence; the Recurrence of Overdose Suicide Attempt (ROSA) index. Receiver operating characteristic (ROC) analysis was used to evaluate the predictive ability of ROSA index. The optimal cutoff was defined as the point of the maximum sum of sensitivity and specificity results.

Statistical analyses were performed using EZR (Saitama Medical Center, Jichi Medical University, Saitama, Japan), which is a graphical user interface for R (The R Foundation for Statistical Computing, Vienna, Austria).[20]

RESULTS

Patient background and factors associated with recurrence

In total, 419 patients were included in this study. The mean age was 39 ± 17 years, 306 patients (73%) were women, 159 patients (38%) had an organized suicide plan, and 333 patients (79%) had previously been diagnosed with a psychiatric disorder. The most common medications used for the overdose were prescribed by medical institutions (81%) and over-the-counter drugs (19%) (Table 1).

Table 1 Comparison of characteristics between the patients who repeated an intentional overdose within 1 year of discharge (Recurrence) and those who did not (No recurrence)

	Total (N = 419)	No recurrence (n = 376)	Recurrence (n = 43)	P
Age, y, mean ± SD	39.0 ± 17.0	39.3 ± 17.3	36.5 ± 12.5	0.303
Female sex, *n* (%)	306 (73)	267 (71)	39 (91)	0.006
Organized suicide plan, *n* (%)	159 (38)	139 (37)	20 (47)	0.247
Previous suicide attempt, *n* (%)	248 (59)	212 (56)	36 (84)	<0.001
Familial and/or social support, *n* (%)	270 (64)	245 (65)	25 (58)	0.402
Anxiety and/or insomnia at discharge, *n* (%)	220 (53)	185 (49)	35 (81)	<0.001
Number of combinations of psychotropic medications, *median (IQR)*	4 (2–6)	4 (1–5)	5 (5–6)	<0.001
Previous diagnosis of psychiatric disorder, *n* (%)	333 (79)	293 (78)	40 (93)	0.017
F2: Schizophrenia, schizotypal and delusional disorders *n* (%)	44 (11)	37 (10)	7 (16)	0.192
F3: Mood disorders, *n* (%)	188 (45)	172 (46)	16 (37)	0.333
F4: Neurotic, stress-related, and somatoform disorders, *n* (%)	69 (16)	54 (14)	15 (35)	0.002

F6: Disorders of adult personality and behaviour, n (%)	9 (2)	9 (2)	0 (0)	0.607
Other, n (%)	23 (5)	21 (6)	2 (5)	

IQR: interquartile range
F2, F3, F4, and F6: classifications according to the International Classification of Diseases, 10th revision.

Of the 419 patients, 43 (10%) repeated an intentional overdose within 1 year of discharge. A comparison of this group with the remaining patients was conducted (Table 1). Five variables were associated with overdose recurrence from univariate analyses: female sex (P = 0.010), a previous suicide attempt (P = 0.001), the number of combinations of psychotropic medications (P < 0.001), positive anxiety and/or insomnia symptoms at hospital discharge (P < 0.001), and the presence of an anxiety disorders (ie, an ICD-10 classification of F4) (P < 0.001).

Development of the ROSA index

To convert the number of psychotropic medications to a categorical variable, ROC analysis was used to determine the optimal cutoff for predicting the recurrence of an intentional overdose (Fig. 1). This approach showed that the optimal cutoff was ≥5 drugs. Multivariable logistic regression models showed that four variables were associated with recurrence: anxiety and/or insomnia symptoms at hospital discharge (odds ratio (OR), 4.24; 95% confidence interval (CI), 1.76–10.2; P = 0.001), the use of five or more psychotropic medications (OR, 5.52; 95% CI, 2.38–12.8; P < 0.001), diagnosis of an ICD-F4 anxiety disorders (OR, 2.41; 95% CI, 1.10–5.27; P = 0.028), and female sex (OR, 3.41; 95% CI, 0.98–11.9; P = 0.054) (Table 2). Each variable was converted into a simple score based on the coefficient of variation. Thus, the ROSA index was defined as the total of four-component scores that included female sex (1 point), anxiety and/or insomnia symptoms at discharge (2 points), use of five or more psychotropic medications (2 points), and a diagnosis of an anxiety disorders (1 point), with a total score in the 0–6 range (Table 3).

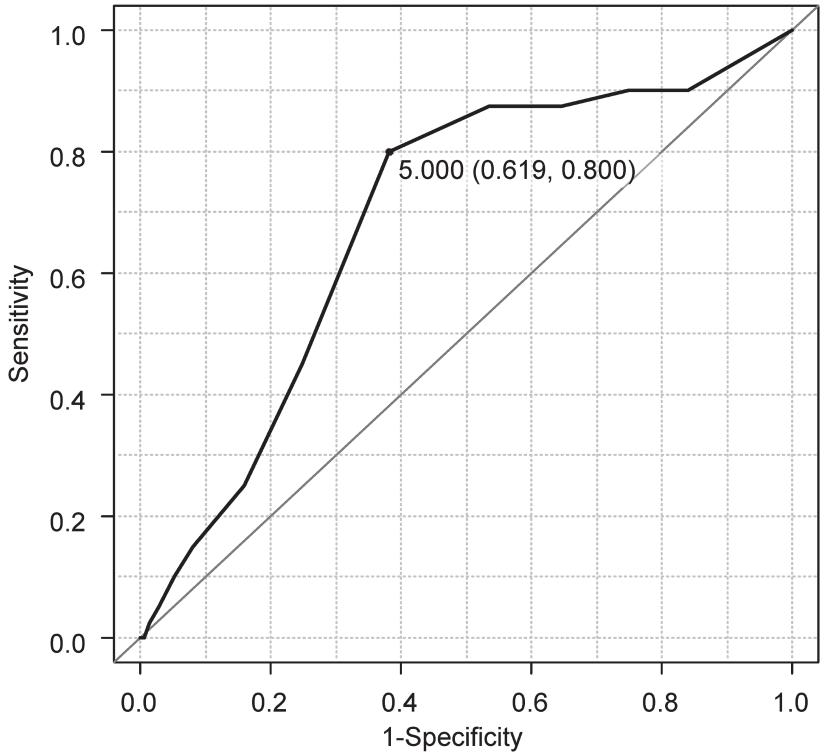

Fig. 1 Receiver operating characteristic curve for the number of psychotropic medications used by patients as a predictor of the recurrence of an intentional overdose within 1 year of discharge
The area under the curve was 0.680 (95% confidence interval, 0.605–0.769). The optimal cutoff value for predicting recurrence was ≥5 drugs.

Table 2 Risk factors for the recurrence of an intentional overdose within 1 year of discharge

	Univariate		**Multivariate**		
	OR (95%CI)	*P* value	coefficient	OR (95%CI)	*P* value
Age	0.99 (0.97–1.01)	0.303			
Female sex	3.98 (1.39–11.4)	0.010	1.23	3.41 (0.98–11.9)	0.054
Organized suicide plan	1.48 (0.79–2.80)	0.224			
Previous suicide attempt	3.98 (1.73–9.17)	0.001		1.52 (0.61–3.79)	0.375
Familial and/or social support	0.74 (0.39–1.40)	0.364			
Anxiety and/or insomnia at discharge	4.52 (2.04–9.99)	<0.001	1.44	4.24 (1.76–10.2)	0.001
Psychotropic medications (≥5)	6.49 (2.91–14.5)	<0.001	1.71	5.52 (2.38–12.8)	<0.001
Anxiety disorders (ICD-10 F4)	3.19 (1.6–6.37)	<0.001	0.88	2.41 (1.10–5.27)	0.028

OR: odds ratio
CI: confidence interval
ICD-10: International Classification of Diseases, 10th revision

Table 3 Factors included in the ROSA index and their associated scores

	Score
Female sex	1
Anxiety and/or insomnia at discharge	2
Use of five or more psychotropic medications	2
Diagnosis of an anxiety disorders	1

ROSA: Recurrence of Overdose Suicide Attempt index

The area under the ROC curve was 0.797. Using optimal cutoff values of ≥4 for the ROSA scale, the sensitivity was 72.1% and specificity, 75.8% (Fig. 2). The positive and negative predictive values for ROSA ≥ 4 were 25.4% and 96.0%, respectively. The recurrence rate for patients with ROSA ≥ 4 points was 25.4% (Fig. 3).

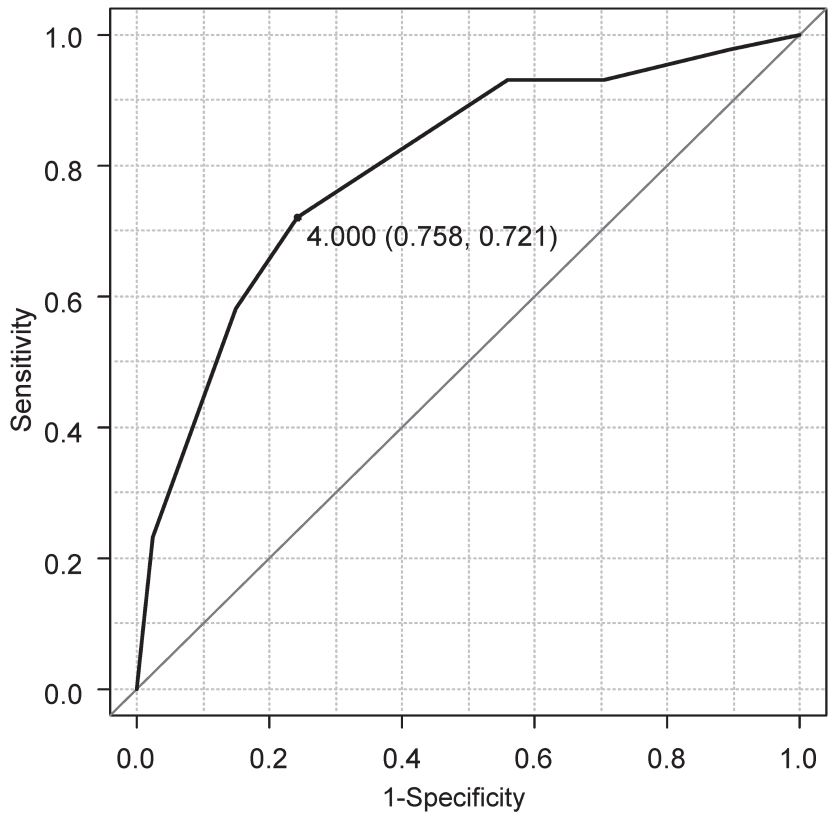

Fig. 2 Receiver operating characteristic curve for the Recurrence of Overdose Suicide Attempt score as a predictor of the recurrence of an intentional overdose within 1 year of discharge
The area under the curve was 0.797 (95% confidence interval, 0.725–0.868). With a cutoff of ≥4 points, the sensitivity for predicting recurrence was 72.1% and the specificity was 75.8%.

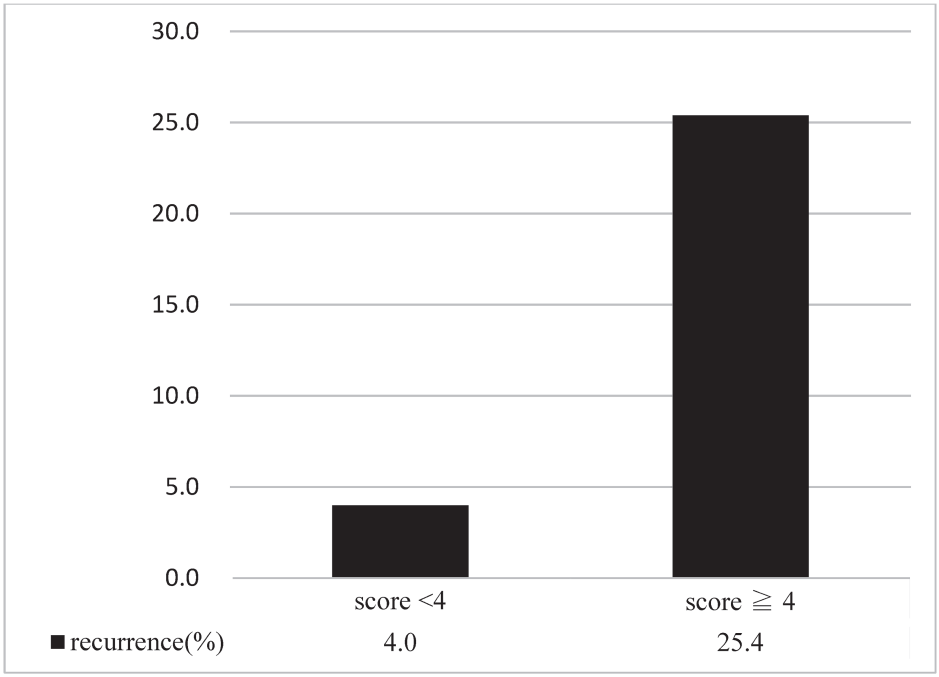

Fig. 3 The relationship between Recurrence of Overdose Suicide Attempt scores and the rate of recurrence of an intentional overdose within 1 year of discharge
Patients with a Recurrence of Overdose Suicide Attempt score < 4 points had a recurrence rate of 4.0%, while those with a score of ≥4 points had a recurrence rate of 25.4%.

DISCUSSION

Suicide is a major national social issue in Japan, and repeated intentional overdoses pose a significant economical and medical burden to both emergency medicine and psychiatry disciplines. Identifying individuals at risk of future suicide attempts is clinically important for its prevention. In this study, we quantitatively evaluated risk factors for the recurrence of an intentional overdose within 1 year of discharge and developed a novel index for predicting such a recurrence.

Our results showed that recurrence was significantly associated with female sex, the use of five or more psychotropic medications, a diagnosis of an ICD-F4 anxiety disorders, and anxiety and/or insomnia symptoms at hospital discharge, but not with having an organized suicide plan, a previous suicide attempt, family and/or social support access, or a personality disorder diagnosis (ICD-F6). Intentional overdose is more common in women than in men[21]; thus, our results suggest women are proportionately more likely than men to repeat an overdose.

We examined whether the recurrence of an intentional overdose was associated with various types of psychiatric disorder. We identified no statistically significant associations with such personality disorders. This could be due to the very low incidence of personality disorders in our cohort.

In contrast, insomnia and/or anxiety symptoms at discharge were associated with the recurrence of an intentional overdose. These symptoms may indicate an uncontrolled underlying psychiatric disorder. The impact of psychiatric intervention on preventing future suicide attempts remains controversial,[22,23] but our findings provide insights into the future management of suicide

prevention in this high-risk subgroup. In particular, it is possible that treating insomnia and anxiety could prevent further suicide attempts. We identified no significant association between a previous suicide attempt and a future episode, and many individuals who committed suicide were not treated despite having a mental disorder.[24] This suggests the clinical focus should be on a patient's current symptoms rather than their past medical history.

Our finding that multiple psychotropic medications were associated with the recurrence of an intentional overdose provides further evidence that the mental symptoms of patients who overdosed may not have been appropriately managed. This finding is consistent with a previous report indicating that lower doses of prescribed benzodiazepine were associated with a lower risk of a subsequent overdose.[22] Easy access to large amounts of medication, the development of drug dependency, side effects associated with polypharmacy, and inadequate assessment of adherence may also synergistically increase the likelihood of a future overdose.[25] This suggests that a repeated overdose may be iatrogenic to some extent.

Recently, the role of the pharmacist in preventing polypharmacy has received greater attention.[6] Pharmacist-level actions such as questioning the prescription and providing information to prescribing doctors may be effective in reducing polypharmacy and reducing these iatrogenic overdoses.[6] The provision of social and psychological support in addition to psychiatric treatment for patients using multiple psychotropic medications may also help prevent further suicide attempts.[26,27] Therefore, an interdisciplinary team of emergency physicians, psychiatrists, nurses, pharmacists, clinical psychologists, and caseworkers must be assembled for patients at high risk of recurrence. During this conference, discussions must include not only the prevention of polypharmacy but also the patient's post-discharge care. If the patient is diagnosed as requiring ongoing psychiatric care, it must be explained to the patient and family that psychiatric assistance is needed. The effectiveness of this case management approach has been previously confirmed in Japan.[28]

In this study, we proposed the ROSA index which is a simple and good predictor of a repeated overdose. After hospitalization, patients often transiently lose their suicidal ideation.[29] In previous studies, the denial of suicide intention at recovery was associated with a somewhat increased risk of suicide attempt after discharge.[7] The ROSA index showed a high negative predictive value, which is essential for screening tools. Importantly, the index may be a useful screening tool for identifying individuals with a high risk of a future suicide attempt even when there is no suicidal ideation at discharge.

Study limitations

This study had some limitations. Firstly, because of the single-center nature of the study, selection bias may have occurred in terms of the restricted selection of inhabitants in this particular suburban area in Japan. Indeed, the percentages of patients with various psychiatric disorders differed from those in previous studies. For example, the incidence of personality disorders in our cohort was so low that patients who do not regularly see a psychiatrist may not be properly diagnosed. Further evaluation of the risk for further suicide attempts with each type of psychiatric disorder is needed.

In addition, because of the sample size, we only performed a derivation study of ROSA index. External validity should be evaluated in future trials. Secondly, the recurrence of overdose may be undervalued because it is possible that some individuals who repeated an overdose were admitted to another hospital without notice. However, our hospital is the only tertiary medical center in the area and all patients who overdosed and called an ambulance in this area were transferred to our hospital. Thus, external validation is needed. Thirdly, the severity of insomnia and anxiety symptoms was not considered because of the retrospective nature of the study. These symptoms

should be quantitatively evaluated in a future prospective multicenter study.

CONCLUSION

The ROSA index provides a novel scoring system for assessing the possibility of a repeated overdose with reasonable sensitivity and a good negative predictive value. It may be a useful screening tool for identifying individuals with a high risk of a future suicide attempt even when there is no suicidal ideation at discharge. Additional multicenter studies must be conducted for the further validation of this index.

ACKNOWLEDGMENTS

The authors would like to thank all participants in this study and the hospital staff for their cooperation.

DISCLOSURE STATEMENT

Authors' contributions

All authors conceptualized and designed the study. The authors read and approved the final manuscript.

Funding

The authors received no specific funding for this work.

Ethics approval and consent to participate

This study was approved by the Ethics Committee of Fujita Health University Hospital.

Conflict of interest

The authors declare that there is no conflict of interest.

REFERENCES

1 Ministry of Health, Labour and Welfare. Statistics and other data. https://www.mhlw.go.jp/content/r2h-1-10.pdf. Published 2020. Accessed July 5, 2021.
2 Spicer RS, Miller TR. Suicide acts in 8 states: incidence and case fatality rates by demographics and method. *Am J Public Health*. 2000;90(12):1885–1891. doi:10.2105/ajph.90.12.1885.
3 Runeson B, Tidemalm D, Dahlin M, Lichtenstein P, Långström N. Method of attempted suicide as predictor of subsequent successful suicide: national long term cohort study. *BMJ*. 2010;341:c3222. doi:10.1136/bmj.c3222.
4 Yasuda M, Kobayashi T. Suicide attempts by drug overdose at Jichi Medical University Hospital emergency centre: A study of patient characteristics and quantity of drug overdose. *Asian J Psychiatr*. 2019;41:34–37. doi:10.1016/j.ajp.2018.10.015.
5 Ito A, Okubo Y. Features and issues related to substance dependence of inpatients involved in suicide attempts and self-harm from the standpoint of the re-suicide prevention [in Japanese]. *Jpn J Gen Hosp Psychiatry*. 2011;23(3):268–276. doi:10.11258/jjghp.23.268.
6 Shimane T. Pharmacist as gatekeeper: combating medication abuse and dependence [in Japanese]. *Yakugaku Zasshi*. 2013;133(6):617–630. doi:10.1248/yakushi.13-00056-2.
7 Ando S, Matsumoto T, Kanata S, et al. One-year follow up after admission to an emergency department

for drug overdose in Japan. *Psychiatry Clin Neurosci*. 2013;67(6):441–450. doi:10.1111/pcn.12079.
8 Finkelstein Y, Macdonald EM, Hollands S, et al. Repetition of intentional drug overdose: a population-based study. *Clin Toxicol (Phila)*. 2016;54(7):585–589. doi:10.1080/15563650.2016.1177187.
9 Hawton K, Zahl D, Weatherall R. Suicide following deliberate self-harm: long-term follow-up of patients who presented to a general hospital. *Br J Psychiatry*. 2003;182:537–542. doi:10.1192/bjp.182.6.537.
10 Crandall C, Fullerton-Gleason L, Aguero R, LaValley J. Subsequent suicide mortality among emergency department patients seen for suicidal behavior. *Acad Emerg Med*. 2006;13(4):435–442. doi:10.1197/j.aem.2005.11.072.
11 Patterson WM, Dohn HH, Bird J, Patterson GA. Evaluation of suicidal patients: the SAD PERSONS scale. *Psychosomatics*. 1983;24(4):343–345, 348–349. doi:10.1016/S0033-3182(83)73213-5.
12 Beck AT, Weissman A, Lester D, Trexler L. The measurement of pessimism: the hopelessness scale. *J Consult Clin Psychol*. 1974;42(6):861–865. doi:10.1037/h0037562.
13 Brent DA, Baugher M, Bridge J, Chen T, Chiappetta L. Age- and sex-related risk factors for adolescent suicide. *J Am Acad Child Adolesc Psychiatry*. 1999;38(12):1497–1505. doi:10.1097/00004583-199912000-00010.
14 Tiihonen J, Lönnqvist J, Wahlbeck K, Klaukka T, Tanskanen A, Haukka J. Antidepressants and the risk of suicide, attempted suicide, and overall mortality in a nationwide cohort. *Arch Gen Psychiatry*. 2006;63(12):1358–1367. doi:10.1001/archpsyc.63.12.1358.
15 Irigoyen M, Porras-Segovia A, Galván L, et al. Predictors of re-attempt in a cohort of suicide attempters: A survival analysis. *J Affect Disord*. 2019;247:20–28. doi:10.1016/j.jad.2018.12.050.
16 Hakansson A, Bradvik L, Schlyter F, Berglund M. Factors associated with the history of attempted suicide. *Crisis*. 2010;31(1):12–21. doi:10.1027/0227-5910/a000008.
17 Zouk H, Tousignant M, Seguin M, Lesage A, Turecki G. Characterization of impulsivity in suicide completers: ckinical, behavioral and psychosociaidimensions. *J Affect Disord*. 2006;92(2–3):195–204. doi:10.1016/j.jad.2006.01.016.
18 Fujino Y, Mizoue T, Tokui N, Yoshimura T. Prospective cohort study of stress, life satisfaction, self-rated health, insomnia, and suicide death in Japan. *Suicide Life Threat Behav*. 2005;35(2):227–237. doi:10.1521/suli.35.2.227.62876.
19 World Health Organization. *The ICD-10 Classification of Mental and Behavioral Disorders; Clinical and Diagnostic Guidelines*. Geneva, Switzerland: World Health Organization; 1992.
20 Kanda Y. Investigation of the freely available easy-to-use software "EZR" for medical statistics. *Bone Marrow Transplant*. 2013;48(3):452–458. doi:10.1038/bmt.2012.244.
21 Ozaki Y, Nakata Y, Kameoka M, Hayashi N, Nakayama Y, Yagi K. Clinical analysis of 104 cases of overdose in suicide attempts [in Japanese]. *Chudoku Kenkyu*. 2007;20(4):367–374.
22 Okumura Y, Nishi D. Risk of recurrent overdose associated with prescribing patterns of psychotropic medications after nonfatal overdose. *Neuropsychiatr Dis Treat*. 2017;13:653–665. doi:10.2147/NDT.S128278.
23 Kanehara A, Yamana H, Yasunaga H et al. Psychiatric intervention and repeated admission to emergency centres due to drug overdose. *BJPsych Open*. 2015;1(2):158–163. doi:10.1192/bjpo.bp.115.002204.
24 Isometsä ET, Lönnqvist JK. Suicide attempts preceding completed suicide. *Br J Psychiatry*. 1998;173:531–535. doi:10.1192/bjp.173.6.531.
25 Breggin PR. Suicidality, violence and mania caused by selective serotonin reuptake inhibitors (SSRIs). A review and analysis. *Int J Risk Saf Med*. 2003;16(1):31–49.
26 Fawcett J. Treating impulsivity and anxiety in the suicidal patient. *Ann N Y Acad Sci*. 2001;932:94–102; discussion 102–105. doi:10.1111/j.1749-6632.2001.tb05800.x.
27 Takai M, Kamijo Y, Ide A. Clinical and psychosocial factors associated with deliberate self-poisoning using psychotropic medications at the emergency medical center [in Japanese]. *J Jpn Soc Emerg Med*. 2015;18(1):22–29. doi:10.11240/jsem.18.22.
28 Kawanishi C, Aruga T, Ishizuka N, et al. Assertive case management versus enhanced usual care for people with mental health problems who had attempted suicide and were admitted to hospital emergency departments in Japan (ACTION-J): a multicentre, randomised controlled trial. *Lancet Psychiatry*. 2014;1(3):193–201. doi:10.1016/S2215-0366(14)70259-7.
29 Ookura R, Mino K, Ogata M. Clinical characteristics of patients with psychotropic drug overdose admitted to the emergency department [in Japanese]. *J Jpn Assoc Acute Med*. 2008;19(9):901–913. doi:10.3893/jjaam.19.901.