Suicidality Assessment of the Elderly With Physical Illness in the Emergency Department

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INTRODUCTION

Taking into account and evaluating the presence of a physical illness plays a crucial role in the clinical encounter with the elderly who may present suicidal ideation (SI) and suicidal behavior (SB) (1, 2).

On the one hand, physical illness is associated with greater suicidality risk in the elderly. This association has been inferred from both quantitative and qualitative findings based on population and registry cohorts (3–5), case-control studies (6–13), psychological autopsies (14, 15), coroners’ reports (16, 17), and suicide notes (17, 18) [for reviews, see (19, 20)]. This applies to SI/wishes to die (20–22) and the entire span of SB, including suicide attempts (SAs) and completed suicides [for reviews, see (20, 23, 24)].

On the other hand, a physical illness may render the suicidality assessment of the elderly complex for multiple reasons (25): a) the possible presence of uncommon or masking clinical features of both SB (indirect or passive SB, e.g. self-starvation) and psychiatric disorders associated with SB (e.g. atypical depressive disorders with prevalent somatic or cognitive symptoms) (26–28); b) the risk of overlooking and missing SB when severe illnesses coexist (29); c) the frequent reticence among the elderly in externalizing SI as they place more emphasis on their physical conditions (30–33); and d) the eventual caregivers’ representations of suicide as a more “understandable” act when facing greater physical fragilities and the intrinsic proximity of the end of life (34, 35). S. de Beauvoir wrote in the 1970s about the feeling of resignation or impotence of what may be considered an inexorable outcome: “Some suicides of elder people follow states of neurotic depression that one has not been able to heal; but most are normal reactions to an irreversible, desperate situation, experienced as intolerable” (36).
A large number of the elderly who died by suicide had had recent contact with primary healthcare professionals, including in emergency departments (EDs). Approximately 50 to 70% of individuals had consulted a healthcare professional in the 30 days preceding their death (32, 37), and more than 80% had done so in the six months prior to death (38). In most of these cases, the last consultation had focused on physical complaints in the absence of a psychiatric diagnosis (32, 37). Notably, affective disorders in the geriatric population can go undiagnosed by ED physicians (39).

The aim of this opinion paper is to point out the opportunity of assessing suicidality in the elderly when they present to the ED with physical illness. To this purpose, it could be useful to overview some both controversial and consensual key points on suicidality risk in the elderly, as discussed below.

**DISCUSSION**

**Some Controversial Matters**

When considering whether the presence of the physical disease is a significant risk factor for suicidality in older versus younger patients, a legitimate objection could be that the former has statistically higher somatic susceptibility. The same objection could be raised to the argument that an increasing rate of SI/wishes to die (21), SAs (40), and completed suicides (5, 6, 8, 41) in the elderly has been observed in the presence of multiple somatic illnesses (a "burden of physical illness"). The answer to this question is probably addressed by qualitative studies, from which the subjective attributions of mental suffering as a somatic illnesses are most likely characterized by a lower degree of certainty and predictability (29). An extensive discussion of the current literature could be reached to the evaluator and in a way that could be considered as a warning sign, especially in males (15), in particular, those with serious and multiple illnesses (6). The risk of completed suicides has been shown to differ between males than females depending on the type of physical illness (4). In the old-old patients, hospitalization with a physical illness conferred a greater risk of completed suicides in males (41).

Another debated point is the extent to which mental comorbidities contribute to the suicidality risk in the elderly (1). Psychiatric disorders such as major depressive disorder and substance use disorder have been shown to play a significant role in death by suicide among individuals older than 65 years (6, 42, 43). While some studies found that the effect of physical illness on suicidality risk persisted even after controlling for comorbid mental disorders (5, 9), others have reevaluated physical illness to a secondary contributing risk factor (16, 29). Major depressive disorder, in analogy with functional impairment or pain, could be considered as a possible mediating factor that partially explains the link between physical illness and suicidality risk (physical illness causes/contributes to the occurrence of depressive disease and the latter increases suicidality risk); similarly, substance use disorder (e.g., alcohol, benzodiazepine, or opioids abuse) may be included in this reciprocal link, initially interpreted as tentative of self-medication that eventually exacerbates both major depression and suicidality (4, 19, 28, 43–45).

**And Some Common Clinical Features**

In recent years, studies have highlighted the role of physical illness, especially among the oldest patients. Physical illness exerted a stronger motivational effect for suicide in old-old (≥75 years old) attempters compared to their young-old (65–74 years old) and middle-aged (64–50 years old) counterparts (46). One-third of those 70+ years of age who had attempted suicide attributed their act to somatic distress (47). Among those who had died by suicide, a greater incidence of physical illness was reported in the old-old compared to the young-old (38, 48) and middle-aged adults (38). Those in whom the reason for completed suicide was attributed to the presence of physical illness were older than those in whom the reason was attributed to the presence of mental illness (17). Hospitalization due to physical illness had the greatest influence on the risk of completed suicide among the old-old (41).

Contrary to findings in the general population, in the elderly non-lethal events seem to be more common in males (1), especially among the young-old where this has been attributed to so-called "elderly adolescentism" (49). Improvements to welfare and healthcare may have led to a rejuvenation of the 65–74 age group, which could be at the origin of certain behavioral patterns such as SA intended as a “cry-for-help” in response to environmental adversities (49). In this case, the stressful context could be represented by the occurrence of one or more physical illnesses (49). In studies that did not utilize the distinction between old-old, middle-aged, and young adults, the proportion reporting that SA was due to physical illness did not differ between males and females in the 70+ age group (47, 50). As far as completed suicides, the presence of physical illness should be considered as a warning sign, especially in males (15), in particular, those with serious and multiple illnesses (6). The risk of completed suicides has been shown to differ between males than females depending on the type of physical illness (4). In the old-old patients, hospitalization with a physical illness conferred a greater risk of completed suicides in males (41).

Globally, neurological diseases, pain, and oncological conditions occurred more frequently in the suicidal elderly. An association between neurologic diseases and SI, SA, and SB was observed (6, 12, 51–55), especially for stroke and hemiplegia (4, 11, 13, 56, 57), epilepsy (4, 8, 45, 58), and dementia (13, 59, 60). A greater rate of SI was documented in patients with Parkinson’s disease (60, 61), and the role of sub-thalamic deep brain stimulation (DBS) on suicidality risk in patients treated for extrapyramidal movement disorders is still discussed [for a recent systematic review, see (62)]. The pain was significantly and independently associated with SI/wishes to die (21, 22, 63–66) and completed suicides (8, 10, 17). Oncological conditions in the elderly were shown to be associated with SI, and the entire span of SB (3, 4, 6, 7, 11, 13, 17, 67, 68).

**CONCLUSIONS**

The elderly who attend the ED with a physical illness are vulnerable individuals and the ED visit often represents a “sentinel event” that may signal a medical or psychosocial fracture in their established equilibrium (69, 70).

In addition to investigation and management of physical illness, attention needs to be paid to its psychic repercussion
on the elderly. This also includes addressing and assessing suicidality that, for the reasons synthesized in the introduction, is frequent in this population but can be missed by the clinician. In a specular way, recommendations on suicidality prevention measures in the elderly encourage a so-called “multi-faceted” approach, which emphasizes the in-depth consideration of aspects related to the presence of physical illness, considered among the most relevant determinants of the elderly’s SI and SB (37, 71–74).

This opportunity involves both primary healthcare professionals and psychiatrists. The ED represents a clinical setting where the elderly with both physical illness and greater

![Figure 1](https://example.com/figure1.png)

**FIGURE 1** | A proposal for a potential tiered suicidality assessment in the elderly with physical illness attending an Emergency Department.
suicidality risk frequently converge. Conversely, the ED, by offering an integrated somatic/psychiatric approach, constitutes a precious resource for this complex and fragile population.

Not every elderly patient who arrives at the ED with physical illness can be screened for suicide. Thus, there are some pragmatic considerations, which would limit this approach in the clinical practice. They are dictated by the clinical condition of the patient (e.g. urgency/severity of the physical illness, consciousness level) and the amount of resources, regarding both staff and time, which can be allotted for the suicidality assessment. To achieve a more balanced cost-benefit ratio, we propose —mainly on the basis of a previous Canadian work (75)— a potential example of a tiered assessment (2, 23, 43, 76) (Figure 1).

The ED, the place of what cannot be deferred, may be finally at the center of the clinical and human encounter with the elderly who, confronted with the possibility of approaching the end of their existences (perceived as more concrete or urgent by the presence of physical illness), present a moral pain experienced as non-repairable. The dialogue with these patients in the ED can constitute the beginning of a therapeutic relationship aimed at trying to understand the individual meaning to the urgency of their days, and therefore to explore an alternative to suicide as unique possibility to avoid the unbearable psyche.

Future research is needed to refine the comprehension of the suicidality peculiarities in the elderly population and translate it into clinical practice through an eventual feasible, validated, and consensual screening.

**AUTHOR CONTRIBUTIONS**

AC, AAm, MR, and JA researched the literature and drafted the primary manuscript. SM, MP, AAg, and GS carefully revised the manuscript. GS, MA, GB, LM, and MPO supervised all steps of the work and provided the intellectual impetus. All authors contributed to the article and approved the submitted version.

**REFERENCES**

1. De Leo D, Draper B, Krysiniska K. Suicidal elderly people in clinical and community settings. Risk factors, treatment and suicide prevention. In: Wasserman D, Wasserman C, editors. Suicideology and Suicide Prevention. Oxford, UK: Oxford University Press (2009). p. 703–19.

2. Conwell Y, Van Orden K, Caine ED. Suicide in older adults. Psychiatr Clin North Am (2011) 34:451–68. doi: 10.1016/j.psc.2011.02.002

3. Shelef A, Hiss J, Cherkashin G, Berger U, Aizenberg D, Baruch Y, et al. Psychosocial and medical aspects of older suicide completers in Israel: a 10-year survey. Int J Geriatr Psychiatry (2014) 29:846–51. doi: 10.1002/gps.4070

4. Erlangsen A, Stenager E, Conwell Y. Physical diseases as predictors of suicide in older adults: a nationwide, register-based cohort study. Soc Psychiatry Psychiatr Epidemiol (2015) 50:1427–39. doi: 10.1007/s00127-015-1051-0

5. Almeida OP, McCaul K, Hankey GJ, Yeap BY, Golledge J, Flicker L. Suicide in older men: the health in men cohort study (HIMS). Prev Med (2016) 93:33–8. doi: 10.1016/j.ypmed.2016.09.022

6. Waern M, Rubenowitz E, Runeson B, Skoog I, Wilhemsson K, Allebeck P. Burden of illness and suicide in elderly people: case-control study. BMJ (2002) 324:1355. doi: 10.1136/bmj.324.7350.1355

7. Quan H, Arboleda-Flórez J, Fick GH, Stuart HL, Love EJ. Association between physical illness and suicide among the elderly. Soc Psychiatry Psychiatr Epidemiol (2002) 37:190–7. doi: 10.1007/s001270200014

8. Juurlink DN, Herrmann N, Szalai JP, Kopp A, Redelmeier DA. Medical illness and the risk of suicide in the elderly. Arch Intern Med (2004) 164:1179–84. doi: 10.1001/archinte.164.11.1179

9. Duberstein PR, Conwell Y, Conner KR, Eberly S, Caine ED. Suicide at 50 years of age and older: perceived physical illness, family discord and financial strain. Psychol Med (2004) 34:137–46. doi: 10.1017/s0033291703008584

10. Harwood DMJ, Hawton K, Hope T, Harriss L, Jacoby R. Suicide and life problems and physical illness as risk factors for suicide in older people: a descriptive and case-control study. Psychol Med (2006) 36:1265–74. doi: 10.1017/s0033291706007872

11. Voaklander DC, Rowe BH, Dryden DM, Pahal J, Saar P, Kelly KD. Medical illness, medication use and suicide in seniors: a population-based case control study. J Epidemiol Commun Health (2008) 62:138–46. doi: 10.1136/jech.2006.055333

12. Conwell Y, Duberstein PR, Hirsch JK, Conner KR, Eberly S, Caine ED. Health status and suicide in the second half of life. Int J Geriatr Psychiatry (2010) 25:371–9. doi: 10.1002/gps.2348

13. Jia CX, Wang L, Xu AQ, Dai Y, Qin P. Physical illness and suicide risk in rural residents of contemporary China. Crisis (2014) 35:330–7. doi: 10.1027/0227-5910/a000271

14. Harwood D, Hawton K, Hope T, Jacoby R. Suicide in older people without psychiatric disorder. Int J Geriatr Psychiatry (2006) 21:363–7. doi: 10.1002/gps.1473

15. Pomplini M, Innamorati M, Masotti V, Personnè F, Lester D, Di Vittorio C, et al. Suicide in the elderly: a psychological autopsy study in a North Italy area (1994–2004). Am J Geriatr Psychiatry (2008) 16:727–35. doi: 10.1097/JGP.0b013e318170a6e5

16. Snowdon JA, Baume PA. A study of suicides of older people in Sydney. Int J Geriatr Psychiatry (2008) 17:261–9. doi: 10.1002/gps.586

17. Fegg M, Kraus S, Grav M, Bausewein C. Physical compared to mental diseases as reasons for committing suicide: a retrospective study. BMC Palliat Care (2016) 15:14. doi: 10.1186/s12994-016-0088-5

18. Cheung G, Merry S, Sundram F. Late-life suicide: insight on motives and contributors derived from suicide notes. J Affect Disord (2015) 185:17–23. doi: 10.1016/j.jad.2015.06.035

19. Fiské A, O’Reilly AA, Widow RK. Physical health and suicide in late life: an evaluative review. Clin Gerontol (2008) 31:31–50. doi: 10.1080/0731761080947151

20. Fåssberg MM, Cheung G, Canetto SS, Erlangsen A, Lapiere S, Lindner R, et al. A systematic review of physical illness, functional disability, and suicidal behaviour among older adults. Aging Ment Health (2016) 20:166–94. doi: 10.1080/13607863.2015.1083945

21. Lapiere S, Boyer R, Desjardins S, Dubé M, Lorrian D, Prévilles M, et al. Daily hassles, physical illness, and sleep problems in older adults with wishes to die. Int J Psychogeriatr (2012) 24:243–52. doi: 10.1017/s14475977110001591

22. Lapiere S, Desjardins S, Prévilles M, Berbiche D, Lyon Marcoux M. Wish to die and physical illness in older adults. Psychol Res (Libreville II) (2015) 5:125–37. doi: 10.17265/2159-5542/2015.02.005

23. Draper B. Editorial Review. Attempted suicide in old age. Int J Geriatr Psychiatry (1996) 11:577–87. doi: 10.1002/gps.1739

24. Chan J, Draper B, Banerjee S. Deliberate self-harm in older adults: a review of the literature from 1995 to 2004. Int J Geriatr Psychiatry (2007) 22:720–32. doi: 10.1002/gps.1739

25. Van Orden KA, Conwell Y. Issues in research on aging and suicide. Aging Ment Health (2016) 20:240–51. doi: 10.1080/13607863.2015.1065791

26. Gottfried CG. Is there a difference between elderly and younger patients with regard to the symptomatology and aetiology of depression? Int Clin Psychopharmacol (1998) 13(Suppl 5):613–8. doi: 10.1097/00004850-199809005-00004

27. Szanto K, Gildengers A, Mulsant BH, Brown G, Alexopoulos GS, Reynolds CF. Identification of suicidal ideation and prevention of suicidal behaviour in the elderly. Drugs Aging (2002) 19(11):21–4. doi: 10.2165/00002512-200219010-00002

28. Fiske A, Wetherell JL, Gatz M. Depression in older adults. Anna Rev Clin Psychol (2009) 5:363–89. doi: 10.1146/annurev.clinpsy.032408.153621

29. Suominen K, Henriksson M, Isometsä E, Conwell Y, Heila H, Lönnqvist J. Nursing home suicides—a psychological autopsy study. Int J Geriatr Psychiatry (2003) 18:1095–101. doi: 10.1002/gps.1019

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Arciniegas DB, Anderson CA. Suicide in neurologic illness.

Wiktorsson S, Berg AI, Wilhelmson K, Mellqvist Fässberg M, Van Orden K, Costanza A, Baertschi M, Weber K, Canuto A. Maladies neurologiques et suicidabilités a` l`age aux Urgences [Suicidal elderly patient at the emergency department]. La Gazette Med (2015) 4:12-3.

Winterrowd E, Canetto SS, Benoit K. Permissive beliefs and attitudes about older adult suicide: a suicide enabling script? Aging Ment Health (2015) 21:173–81. doi: 10.1080/13607863.2015.1099609

De Beauvoir S. La Vieillesse [Old age]. Gallimard: Paris, France (1970). p. 440.

Conwell Y, Thompson C. Suicidal behavior in elders. Am J Geriatr Psychiatry (2000) 52:115–6. doi: 10.1016/S1474-4422(07)70175-8

Costanza et al. Suicidality Assessment of the Elderly

NatalGuideline_Suicide.pdf (Accessed June 10, 2020).

Betz ME, Schwartz R, Boudreaux ED. Unexpected suicidality in an older emergency department patient. J Am Geriatr Soc (2013) 61:1044–5. doi: 10.1111/jgs.12290

Costanza A, Baertschi M, Weber K, Canuto A, Sarasin F. Le patient suicidaire âgé – de la neurobiologie au manque d’espoir [Neurological diseases and hopelessness: from neurobiology to hopelessness]. Rev Med Suisse (2015) 11:402–5.

Elaisen A, Dalhoff KP, Horwitz H. Neurological diseases and risk of suicide attempt: a case-control study. J Neurol (2018) 265:1303–9. doi: 10.1007/s00415-018-8837-4

Costanza A, Amerio A, Aguglia A, Escellior A, Serafini G, Berardelli I, et al. When sick brain and hopelessness meet: some aspects of suicidality in the neurological patient. CNS Neurosurg Disord Drug Targets (2020). doi: 10.2174/187152719666200611130804

Stenager EN, Madsen C, Stenager E, Boldsen J. Suicide in patients with stroke: epidemiological study. BMJ (1998) 316:1206–10. doi: 10.1136/bmj.316.7139.1206

Christensen J, Vestergaard M, Mortensen PB, Sidenius P, Agerbo E. Epilepsy and risk of suicide: a population-based case–control study. Lancet Neurol (2007) 6:693–9. doi: 10.1016/S1474-4422(07)70175-8

Erlangsen A, Zarit SH, Conwell Y. Hospital-diagnosed dementia and suicide: a longitudinal study using prospective, nationwide register data. Am J Geriatr Psychiatry (2008) 16:220–8. doi: 10.1097/JGP.0b013e3181602a12

Serafini G, Calcagno P, Lester D, Girardi P, Amore M, Pompili M. Suicide risk in Alzheimer’s disease: a systematic review. Curr Alzheimer Res (2016) 13:1083–99. doi: 10.2174/156720501366610720112608

Berardelli I, Belvisi D, Corigliano V, Costanzo M, Innamorati M, Fabbriani G, et al. Suicidal ideation, perceived disability, hopelessness and affective temperaments in patients affected by Parkinson’s disease. J Int Clin Pract (2018) 19:13287.

Berardelli I, Belvisi D, Nardella A, Falcone G, Lamis DA, Fabbriani G, et al. Suicide in Parkinson’s disease: a systematic review. CNS Neurosurg Disord Drug Targets (2019) 18:466–77. doi: 10.2174/187152731966610790393345

Awata S, Seki T, Koizumi Y, Sato S, Hozawa A, Omori K, et al. Factors associated with suicidal ideation in an elderly urban Japanese population: a community-based, cross-sectional study. Psychiatry Clin Neurosci (2005) 59:327–36. doi: 10.1111/j.1440-1819.2005.01378.x

Li LW, Conwell Y. Pain and self-injury ideation in elderly men and women receiving home care. J Am Geriatr Soc (2010) 58:2160–5. doi: 10.1111/j.1532-5415.2010.03151.x

Kang HJ, Stewart R, Jeong BO, Kim SY, Bae KY, Kim SW, et al. Suicidal ideation in elderly Korean population: a two-year longitudinal study. Int Psychogeriatr (2014) 26:59–67. doi: 10.1017/S1041610213001634

Jorm AF, Henderson AS, Scott R, Korten AE, Christensen H, Mackinnon AI. Factors associated with the wish to die in elderly people. Age Ageing (1995) 24:389–92. doi: 10.1093/ageing/24.5.389

Llorente MD, Burke M, Gregory GR, Bosworth HB, Grambow SC, Horner RD, et al. Prostate cancer: a significant risk factor for late-life suicide. Am J Geriatr Psychiatry (2005) 13:195–201. doi: 10.1176/appi.ajgp.13.3.195

Miller M, Mogun H, Azrael D, Hempstead K, Solomon DH. Cancer and the risk of suicide in older Americans. J Clin Oncol (2008) 26:4720–4. doi: 10.1200/JCO.2007.14.3990

Carter MW, Reymann MR. ED use by older adults attempting suicide. Am J Emerg Med (2014) 32:535–40. doi: 10.1016/j.ajem.2012.04.003

Betz ME, Arias SA, Segal DL, Miller I, Camargo CA Jr, Boudreaux ED. Screening for suicidal thoughts and behaviors in older adults in the emergency department. Am J Emerg Med (2012) 30:442–7. doi: 10.1016/j.ajem.2008.01.004

Blazer DG. Depression in late life: review and commentary. J Gerontol A Biol Sci Med Sci (2003) 58:249–65. doi: 10.1093/gerona/58.3.m249

Cheung G, Sundram F. Understanding the progression from physical illness to suicidal behavior: a case study based on a newly developed conceptual model. Clin Gerontol (2017) 40:124–9. doi: 10.1080/07317115.2016.1217962

Kim H, Ahn JS, Kim H, Cha YS, Lee J, Kim MH, et al. Sociodemographic and clinical characteristics of old-age suicide attempters compared with young-old and middle-aged attempters. Int J Geriatr Psychiatry (2018) 33:1717–26. doi: 10.1002/gps.4976

Wiktorsson S, Berg AI, Wilhelmsson K, Mellqvist Fässberg M, Van Orden K, Duberstein P, et al. Assessing the role of physical illness in young old and older old suicide attempters. Int J Geriatr Psychiatry (2016) 31:771–4. doi: 10.1002/gps.4390

Paraschakis A, Douzenis A, Michopoulos I, Christodoulou C, Vassilopoulou K, Koutsafis F, et al. Late onset suicide: distinction between “young-old” vs. “old-old” suicide victims. How different populations are they? Arch Gerontol Geriatr (2012) 54:136–9. doi: 10.1016/j.archger.2012.02.011

Amore M, Solano P. Comportamento suicidario nell’anziano. In: Pompili M, Girardi P, editors. Manuale di Suicidologia. Pisa, Italy: Pacini (2015). p. 397–416.

Wiktorsson S, Rydberg Sterner T, Mellqvist Fässberg M, Skogö I, Ingeborg Berg A, Duberstein P, et al. Few sex differences in hospitalized suicide attempters aged 70 and above. Int J Environ Res Public Health (2018) 15:E141. doi: 10.3390/ijerph15010141

Arciniegas DB, Anderson CA. Suicide in neurologic illness. Curr Treat Options Neurol (2002) 4:457–68. doi: 10.1007/s11940-002-0013-5

Coughlin SS, Sher L. Suicidal behavior and neurological illnesses. J Depress Anxiety (2013) Suppl 9:12443. doi: 10.4172/2167-1044.S9-001

Costanza A, Baertschi M, Weber K, Canuto A. Maladies neurologiques et suicide: de la neurobiologie au manque d’espoir [Neurological diseases and suicide: from neurobiology to hopelessness]. Rev Med Suisse (2015) 11:402–5. doi: 10.53998/jrps15010141

NatalGuideline_Suicide.pdf (Accessed June 10, 2020).
77. Yesavage JA, Brink TL, Rose TL, Lum O, Huang V, Adey M, et al. Development and validation of a geriatric depression screening scale: a preliminary report. *J Psychiatr Res* (1982) 17:37–49. doi: 10.1016/0022-3956(82)90033-4

78. Heisel MJ, Flett GL, Duberstein PR, Lyness JM. Does the Geriatric Depression Scale (GDS) distinguish between older adults with high versus low levels of suicidal ideation? *Am J Geriatr Psychiatry* (2005) 13:876–83. doi: 10.1176/appi.ajgp.13.10.876

79. Heisel MJ, Duberstein PR, Lyness JM, Feldman MD. Screening for suicide ideation among older primary care patients. *J Am Board Fam Med* (2010) 23:260–9. doi: 10.3122/jabfm.2010.02.080163

80. Cheng ST, Edwin CS, Lee SY, Wong JY, Lau KH, Chan LK, et al. The Geriatric Depression Scale as a screening tool for depression and suicide ideation: a replication and extension. *Am J Geriatr Psychiatry* (2010) 18:256–65. doi: 10.1097/JGP.0b013e3181b9edd

81. Heisel MJ, Flett GL. The development and initial validation of the Geriatric Suicide Ideation Scale. *Am J Geriatr Psychiatry* (2006) 14:742–51. doi: 10.1097/01.JGP.0000218699.27899.f9

82. Draper B, Brodaty H, Low LF, Richards V, Paton H, Lie D. Self-destructive behaviors in nursing home residents. *J Am Geriatr Soc* (2002) 50:354–8. doi: 10.1046/j.1532-5415.2002.50070.x

83. Draper B, Brodaty H, Low LF, Richards V. Prediction of mortality in nursing home residents: impact of passive self-harm behaviors. *Int Psychogeriatr* (2003) 15:187–96. doi: 10.1017/s1041610203008871

**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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