Risk Factors for Suicide among Older People and its Prevention: a Brief Review

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Abstract: Specific risk factors of suicide among elderly people have been reported in the literature, e.g. morbid ideas, prior attempted suicide, physical or mental illnesses, difficult socio-economic contexts such as loneliness.

Morbid ideas: the prevalence of suicidal thoughts in the elderly varies between 1.0% and 17% depending on definition criteria and studies. Attempted suicide: The ratio of suicide attempts to successful suicides in the elderly is 4:1. Physical ailments: More than 50% suffer from physical impairments or serious somatic diseases. Mental illness: Up to 90% suffer from severe depression or mood disorders. Difficult socio-economic contexts: social isolation/loneliness, family discord or financial difficulties increase the risk of suicide.

Several preventive approaches show some effectiveness, be it universal prevention targeting the whole population, selective prevention centred on high risk groups or indicated prevention specifically targeting survivors of suicide attempt. Key to most approaches are training of general practitioners to recognize and treat depression, - improving accessibility to care for people at risk, - and restricting access to means of suicide.

Given the complexity of the issue a multi-level and multi-disciplinary approach is recommended by experts, an approach not without limits; which makes some experts say that there is a need for innovations.

Keywords: suicide, risk-factors, elderly, prevention strategies.

1. INTRODUCTION

Suicide is a major public health problem. The World Health Organization estimating that one suicide occurs every 40 seconds across the world [1], the global gross death rate reported globally for 2016 being 10.5/10\textsuperscript{5}, down from 2000 when it was 12.9/10\textsuperscript{5} [2]. For each successful suicide twenty suicide attempts have been documented [1]. Overall suicide death rates for men are almost double that for women (13.7 and 7.5/10\textsuperscript{5}) [3]. WHO reports yearly suicide of close to 130’000 cases for the WHO European region [4] and close to 60’000 in the European Union [5]. Suicide mortality rates vary across European countries [6,7,8]: the highest rates are seen in Central European Countries and the Baltic States such as Lithuania (31.5/10\textsuperscript{5}), Hungary (21.7/10\textsuperscript{5}) and Slovenia (17.2/10\textsuperscript{5}) while the lowest rates are seen in countries from Southern Europe such as Greece (3.0/10\textsuperscript{5}), Italy (5.4/10\textsuperscript{5}) and Spain (5.8/10\textsuperscript{5}) with countries like Portugal in an intermediate situation (11.5/10\textsuperscript{5}). There is a ten-fold difference between the country with the lowest (Greece) and the country with highest (Lithuania) death rates.

Suicide among the elderly. Suicide rates are higher among the elderly than among young people in most states reporting statistics to the World Health Organization [9]; in addition, the elderly are much more determined when they take action[10]. For example data from Italy in 2013 show that 41.4% of the total number of suicide occur among people age 60 and over, as well from national data basis as from a large retrospective autopsy study [11,12]. For example the Swiss Federal Statistical Office reports for 2017 mean standardized death rates of 15.6/10\textsuperscript{5} for men and 5.6/10\textsuperscript{5} for women, rates reaching 9.3 / 10\textsuperscript{5} for women aged 65 to 84 and falling to 3.5 / 10\textsuperscript{5} for those 85 and over and the rates among
men of $33.6 \times 10^5$ among those 65 to 84 years old and $71.7 \times 10^5$ among those aged 85 and over [13]. As for Portugal, over a 30-year period (1980-2009) an increase in suicide rates among the elderly, compared to other age groups, is reported [14,15].

These elements underline the importance of better understanding the problem of suicide in the elderly, especially in elderly men, and its prevention, an area that has been too neglected [16], all the more the number of elderly people will increase considerably over the coming decades: therefore the absolute number of suicides among the elderly is expected to increase accordingly.

2. METHODS

A comprehensive non-systematic review of the scientific literature of the 25 past years (1996-2020) was done through key words entered into the research engine PubMed. The key words used were Suicide and Elderly/End of life/Older People and Suicide Risk factors and Suicide Prevention Strategies. Our inclusion criteria were opportunistic: recent publication, impact factor of the publication, recognized expertise of the authors, type of studies. Furthermore documents from the World Health Organization addressing suicide and its risk factors / prevention strategies were taken into consideration as well as national data from Italy, Portugal and Switzerland.

3. RESULTS OF THE LITERATURE REVIEW

3.1. Identified Risk Factors of Suicide among the Elderly

Most commonly mentioned risk factors of suicide among the elderly in the reviewed papers were:

a. Risk-factor “Suicidal Thoughts (Morbid Ideation)”

According to O’Connell et al. [17] the prevalence of hopelessness or suicidal thoughts in the elderly according to studies and definition criteria varies between 1.0% and 17%. In a study involving 11,425 European participants over age 64 (SHARE study), Saïas et al. [18] report a prevalence rate of morbid ideation of 6.9% in men and 13.0% in women. Differences between countries were observed, with analysis showing that French participants were the most susceptible to morbid ideation, while Greek participants had the lowest level of suicidal thoughts, with Swiss participants falling in the peloton of lead (2nd position) just in front of the Belgian participants. These suicidal thoughts are, when logistic regression analyses are performed, significantly associated with depression (OR: 1.64, 95% CI: 1.59 - 1.70), widowhood (OR: 1.35, 95% CI: 1.12 - 1.63), suffering from a chronic disease (OR: 1.28, 95% CI: 1.07 - 1.53) or old age (over 84 years) (OR: 1.58, 95% CI: 1.15 - 2.18). Rurup et al. [19], as part of the Longitudinal Aging Study Amsterdam, report that social isolation and loneliness are positively correlated with morbid ideation (current wish to die) after control for depression. As for Gilman et al. [20] they report, in a sample of elderly people followed in primary care in the USA, that financial difficulties are associated with an increased risk of suicidal thoughts (OR: 2.35, 95% CI: 1.38 - 3.98). Almeida et al. [21], having carried out a cross-sectional study in Australia among a sample of elderly people followed in primary health care centres (n = 21’290), conclude that a greater proportion of people with social disconnection and stress reported morbid ideas than mood disorders: indeed, according to their analyses, the lack of social network is associated with an high etiological fraction of 38%, followed by a history of depression (23.6%). Fässberg Mellqvist et al. [22], in a systematic review examining social factors and suicidal behaviour in people aged 65 and over, conclude that a low level of social connections is associated with suicidal thoughts, suicide attempts and to suicide later in life. As for Jun Ju et al., using data from a Korean national health survey report that low socioeconomic status is associated with an increased risk of suicidal ideation[23].

b. Risk-factor “Attempted Suicide”

As mentioned above the ratio of suicide attempts to successful suicides in the elderly is much lower than among the young (200:1 in adolescents; 8:1-33:1 in the general population and 4: 1 among the elderly) according to Conwell et al. [24]. In the literature, depression symptoms, sleep disorders, alcohol and substance abuse, social isolation and loneliness, relationship problems and bereavement have been reported as risk factors for attempted suicide in the elderly as well as psychosocial stress, chronic disability, physical illness and pain, psychiatric history [25,26]. While a majority of older people die
during their first suicide attempt, as reported by many authors[27,28,29], it should not be forgotten that people who have attempted suicide constitute a subgroup presenting a high risk of successful later suicide according to Beghi et al., in their review of the literature on risk factors for fatal and non-fatal recurrence of suicide attempts [30]; a finding also made by Bradvik and Berglung[31]in their historical case-control study covering more than 50 years of an elderly population: these authors conclude “repeated suicide attempts in women and severe attempts in men of older age appear to be risk factors for future suicide.”

c. Risk-factor “Physical Ailments”

According to Waern[32] “more than half of people who commit suicide late in life suffer from serious somatic illnesses or physical impairments”. Fässberg Mellqvist et al. in their systematic review including 61 studies on the association between suicide and physical illnesses reported that cancers, chronic obstructive pulmonary disease, neurological disorders or even functional impairments are likely to increase the risk of suicide in the elderly[33]. In their case-control study Waern et al. [34] observed an increased risk of suicide in people with visual impairments (OD 2.0, 95% CI: 2.3 - 21.4), neurological disorders (OD 3.8, 95% CI: 1.5 - 9.4), malignant disease (OD 3.4, 95% CI: 1.2 - 9.8) when controlled for depression. The same authors conclude that any serious somatic disease was an independent risk factor for suicide on multivariate analysis (OD 6.4, 95% CI: 2.0 - 20.0) and that in sick men the suicide rate was four times higher than in controls, an association not being observed in women.

d. Risk-factor “Mental Illness (Recognized or not)”

In their review work on suicide in the elderly Conwell et al.[35] recall that “of all the factors examined in studies of the psychological autopsy type among the elderly, psychiatric illness, mainly depression” - often unrecognized [10] - “always appears to be the most important risk factor” of suicide. In this regard, one may cite as an example several studies on people aged 65 and over: thus Pompili et al.[36] report a rate of severe depression in 50% of the subjects, Conwell et al.[37] in 51% and Waern et al.[38] in 46%. When combining subjects suffering from severe depression with those suffering from mood disorders, the same authors report even larger proportions: according to Waern et al.[38] 82% and Conwell et al.[37] 77%. For people with schizophrenia a Danish national cohort study found an increased risk of suicide, which in men and women aged 70 and over was 2.1 for men (95% CI 1.1 -3.9) and 3.4 for women (95% CI 2.0-5.8)[39]. Regarding the link between suicide and dementia, it seems, according to Kiosses et al., that the data are scarce and not really conclusive [40]. Finally, several studies report a high proportion of suicides among people with excessive alcohol consumption: thus Waern et al. mention 27% in their group of people aged 65 and over[38] and McGirr et al. 29% in their group of people aged 60 and over[41] with an over-representation of men.

e. Risk-factor “Difficult Socio-economic Contexts”

The socio-economic dimension with which an elderly person is confronted is a determinant of the risk of suicide to which this person is exposed[42]. Thus it is reported in the literature that family discord[43], widowhood [44], financial difficulties[45], child abuse[46] are all elements that increase the risk of suicide in the elderly person. Troya et al., in a systematic review on self-injury in the elderly, report a significant association between social isolation / loneliness and suicide (risk ratio of 1.5 (95% CI 1.0-2.3)[47]. More recently Choi et al., in their Korean retrospective longitudinal cohort study, reported an association between poverty and suicide risk in their group of adults aged 60 to 74 (adjusted risk ratio 1.41; CI at 95%, 1.27-1.57), but not beyond the age of 74[48]. The importance of this socio-economic dimension as a risk factor for suicide was underlined by Li et al. in their systematic review and meta-analysis of case-control and cohort studies among the general population [49]: these authors conclude that socio-economic factors present an attributable risk of suicide of the same order as psychological / psychiatric disorders.

3.2. Effective Prevention Strategies Identified

a. Global Approach

Van der Feltz-Cornelis et al.[50], in their systematic review of systematic reviews that investigated effective interventions for suicide prevention (all ages), mention 3 practices that have shown some effectiveness, namely
"training general practitioners (GPs) to recognize and treat depression and suicidality, improving accessibility of care for at-risk people, and restricting access to means of suicide". Recently, a panel of international experts consensually issued a series of considerations to be taken into account in the prevention of suicide in the elderly [51], in particular in view of the (absolute) growing number of suicides among this population. These considerations have been classified according to their operational levels into:

Table 1. Recommendations for the prevention of suicide in the elderly adapted and simplified according to Erlangsen et al. [51]

<table>
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<th>Operational levels</th>
<th>Recommendations</th>
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| **Universal prevention** (the whole population is targeted) | - Set up self-administered screening for depression for the population  
- Limit access to means of suicide  
- Address problems related to aging and dependence on others  
- Educate the population about Healthy Aging  
- Provide information on risk and protective factors for suicide in the elderly  
- Develop guidelines for the appropriate reporting of suicide in the elderly |
| **Selective prevention** (high risk groups) | - Provide the staff of medical establishments with systematic screening tools  
- Ensure that the effectiveness of psychiatric treatment is improved, for example by ensuring therapeutic adherence  
- Raise awareness of the need to assess the needs of older people, especially older men and provide them with support  
- Raise awareness, within the framework of training programs, of the importance of the losses faced by the elderly, especially men  
- Raise awareness of the risk of alcohol abuse in the elderly  
- Improve the therapeutic management of health problems that reduce the quality of life of the elderly and increase their suicidal thoughts |
| **Indicated prevention** (people in morbid ideation crisis, or having survived a suicide attempt) | - Offer help and support after a suicide attempt  
- Optimize the diagnosis and treatment of depression in the elderly living in an institutional environment  
- Help to explore realistic future prospects  
- Refer to social and community resources who can assess and assist in improving living conditions  
- Talk to elderly suicidal people before any treatment  
- Incorporate into the monitoring items such as home visits, phone calls, postcards, connection to an alarm center  
- Disseminate guidelines for the detection and management of suicidality in the elderly  
- Train professionals in the detection, intervention, and management of depression and suicidal risk in the elderly  
- Train relay people to identify depression and the risk of suicide and to refer them to professionals  
- Keep records of people who attempted suicide |

b. Approach More Specifically Centred on a given Risk Factor

Data from the literature underline the value of selective interventions tailored on specific risk factors:

1. Specific prevention focusing on risk factor **Morbid ideas**:

Okolie et al. [52] in their systematic review of interventions to prevent suicidal behaviours and reduce suicidal ideation in older people mention that “effective interventions were multifaceted primary care-based depression screening, treatment and management programs as well as community-based programs including education, group activities and gatekeeper training”.

2. Specific prevention focusing on risk factor **Attempted suicide**:

Hvid et al. [53] report a protective effect of their active outreach and contact intervention (the OPAC program, a randomized controlled
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trial), i.e.: “the intervention incorporates a psychological understanding of suicidal behaviour inspired by Schneidman’s characteristics of the suicidal patient, including unbearable psychological pain, a sense of isolation and the perception that death is the only solution, to problems about which one feels hopeless and helpless, and the patient's need for an “ombudsman”, active outreach, problem solving, adherence and continuity (especially through contact with the same person) in the acute stage and motivation for possible therapy”. The proportion of patients in the OPAC program who repeated a suicide attempt was lower than in the non OPAC group; furthermore the total number of repetitions during the follow-up were reduced in the OPAC group.

3. Specific prevention focusing on risk factor Physical ailments:
As mentioned by Erlangsen et al. [54] “multiple physical diseases are linked to increased risks of suicide in older adult (lung, gastrointestinal, breast, genital, bladder cancers, lymphomas, epilepsy, cerebrovascular diseases, cataract, heart diseases, chronic obstructive pulmonary disorders, gastrointestinal disease, liver disease, arthritis, osteoporosis, prostate disorders, spinal fractures), thus increased attention to suicidal ideation and risk assessment might be indicated during the diagnosis and treatment of these disorders. Mellqvist Fässberg et al.[33,55] suggest, citing numerous authors, that “integrating mental health care into primary care, medical specialty care, and geriatric health care can be an effective strategy for identifying and treating suicidal older people with physical conditions”. Furthermore “involving family members in the development and implementation of treatment plans for suicidal older persons should be considered in both acute and long-term care settings”.

4. Specific prevention focusing on risk factor Mental illness:
Mann et al.[56], based on their systematic review of suicide prevention strategies, state that “physician education in depression recognition and treatment” as well as “restricting access to lethal methods” reduce suicide rates. Similarly Waern et al. [38], based on their case-control study, conclude that “detecting late-onset depressive disorder at the primary care level is one important approach to the prevention of suicide in late life”. Heisel and Duberstein [57] recommend “clinicians should be vigilant to signs of psychopathology that may not fit standard diagnostic classification”. Lapierre et al. [16], having systematically reviewed elderly suicide prevention programs mention, regarding the effect of prevention programs on depressed elderly patients from primary care settings, the positive impact of the “development of a therapeutic alliance, a personalized treatment plan that include patient preferences, as well as proactive follow-up (biweekly during acute phase and monthly during continuation phase) by a depression care manager”.

5. Specific prevention focusing on risk factor Difficult socio-economic contexts:
Ju et al.[23] in their study of roughly 60’000 individuals age 65 and more have shown that low socio-economic status is associated with an increased risk of suicidal ideation among the elderly, as has also been reported by other researchers [47,48,49]. Ju et al. [23] recommend the “development of prevention programs that focus on the management of poverty in elderly individuals who live alone. Those programs would “need to focus on social support, such as the creation of job opportunities for elderly, food commodity supplementation programs for elders living alone, and public pensions for individuals who are economically insecure”.

4. DISCUSSION
Saïs et al., in their systematic review on actions to prevent suicide in the elderly, carried out between 1990 and 2011, underline the fact that only 2.4% of the works responding to their bibliographic research on “suicide prevention” relate to the elderly population; these authors insist on the need to develop this field of research[58]. They also retain that "most preventive actions cover psychiatric or psychotherapeutic practices" and that "actions primarily targeting the social determinants of suicide in the elderly are rare". Based on their findings, these authors plead for suicide prevention in the elderly to be addressed primarily through multidisciplinary actions focused on the social, community and institutional environments. This would support an approach as the one chosen by the National Program of Actions against Suicide 2011-2014[59] which
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recommends in its Axis I “Development of prevention and postvention”, a measure entitled "Prevent social isolation and psychological distress", which incorporates actions targeted at the elderly, encourage the emergence and development of actions aimed at preventing social isolation among seniors.

Yet the multi-level approach (GP training, raising public awareness, training community facilitators, interventions for patients, high risk groups and their relative), adopted for the general population, in particular within the framework of the Optimizing Suicide Prevention Programs and their implementation in project Europe (OSPI Europe)[60], has shown both its interest and its limits, as those responsible for evaluating the program[61] underline:

Concerning the primary outcomes: “OSPI-Europe interventions did not have a significant global effect in the reduction of the aggregated number of suicidal acts; significant country differences were found concerning intervention effects on suicidal acts”.

Regarding secondary outcomes: “Secondary level outcomes varied by level of intervention and by country but in general the GP and CF training (Levels 1 and 3) were effective in changing attitudes and confidence but raising public awareness was less decisive due to large country variations”.

5. CONCLUSION

If the scientifically established evidence of the effectiveness of prevention strategies might have shown limits, the fact remains that the need to act is imperative. Screening elderly people at high risk of suicide might be an appropriate preventive measure, yet it might be difficult to implement due to its complexity. Some authors suggest exploring new strategies by “prioritizing innovation”, as Christensen and Petrie recommend[62], innovation which may support "strategies for promoting the biopsychosocial well-being of citizens" as suggested by the former head of mental health at the World Health Organization[63] or as Lapière et al.[16] put it, citing numerous authors “strategies that enhance positive aging and quality of life by increasing empowerment, coping and adaptive behaviour, flexibility, social skills, sense of belonging, reasons for living, hope, meaning in life, religion or spirituality and even humour”.

6. FUNDING SOURCES

Funding through regular budget of the Swiss Health Promotion Foundation.

7. AUTHOR CONTRIBUTIONS

Both authors have contributed equally to the paper.

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