**Abstract**

Suicide is a serious problem concerning mental health professionals. In the present paper we will attempt a review of the evidence about the risk factors associated with suicidality among the elderly, mainly factors related with mental health illnesses and mainly depression, somatic illnesses, chronic pain and psychosocial factors, like social isolation, bereavement and financial problems. In addition, issues regarding interventions, at the individual or group level, to prevent suicide are reviewed, including contracting, medication, screening, reducing social isolation, restriction of access to lethal means, community education programs and the role of the general practitioners in detecting proneness to suicide. In addition, we will focus on useful improvements of interventions aiming at reducing suicide rates from a social policy and prevention perspective.

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**EPIDEMIOLOGY**

Suicidal and parasuicidal behavior is a serious problem among the elderly, although it is not a leading cause of death among the elderly, the rates of suicidality among the elderly are elevated among this age group in comparison to other age groups, a pattern that is confirmed across different countries [1].

Reports showed that according to the National Center for Health Statistics among the elderly for persons aged 65-74 and 75-84 rates of suicide are 17.9/100.000 and 24.9/100.000 [2]. According to U.S. Suicide Statistics (2005) for the age group of 65+ the rate of suicide is 14.7/100.000 with men having a rate of 29.5/100.000 and women a rate of 4/100.000 and whites a rate of 15.9/100.000 and non-whites a rate of 5.8/100.000. According to the National Institute of Mental Health of U.S.A. older people are disproportionately likely to die by suicide, of every 100.000 people aged 65 and older, 14.3 died by suicide in 2007, which is higher than the national average of 11.3/100.000 in the general population. It is worth noting that non-Hispanic white men aged 85 or older had an even higher rate with 47 suicides per 100.000. (Centers for Disease Control and Prevention, National Center for Injury Prevention and Control). Between 1950 and 2003 suicide rates overall decreased, however the age groups of 65 and older, although they also had a decrease in suicide rates, they still remained the groups with the highest suicide rates in comparison to the other age groups. Although there is a variability of the overall rate of suicide among nations [2] still older people show a high rate of suicide in comparison to the other groups with the elderly men at higher risk, although suicide is not among the leading causes of death among the elderly, who are more likely to die from other causes as cardiac problems.

Westefeld, et al. Confirm the above data by reporting that the highest suicide rates are seen among the elderly, and that there is an increase of suicide rate for people over 75, with the age group of 85 and older to have the highest prevalence of completed suicides with a rate of 65.3/100.000 [3]. The elderly openly talk about their intentions for suicide, employ violent and lethal means, are less ambivalent about suicide and usually attain a complete suicide. Overall suicide rates among the elderly have been rising in the past [4], suicide rates for both genders rise with age, men are more vulnerable to suicide at all ages [5] with a ratio of 12:1 by the age of 85 regarding men and women [6], suicide rates however among the elderly during that last decade have remained mainly unchanged overall [7], although in certain countries there has been noted an increase of suicide risk for old men [8], while there is a significant variability of suicide rates between countries, mostly due to cultural factors [6,9,10].

**METHOD**

In relation to the method used, the literature review encompassed peer-reviewed articles written in English. Searches were performed in the Academic Research Library, ERIC, Ingenta Connect, Psychnfo, Wilson Education, Wilson Social Sciences, Scopus, Social Sciences Expanded Index, ISI Citation and Google Scholar databases with additional searches in reference lists and the ‘related articles’ function. The review relied on published articles, written in English. The terms searched were elderly suicide, suicide attempts, suicide ideation, suicidality, risk factors, and prevention. No exclusion criteria were followed. It was included meta-analyses, systematic reviews, files review, empirical studies quasi-experimental and correlational studies, population-based case-control studies, studies employing semi-structured psychological autopsy interviews, self-reports,
Methodological issues

Pearson & Conwell in an introduction and commentary of a volume conveying the main dimensions that define suicide in later life advanced in a workshop by the National Institute of Mental Health (NIMH), point to the fact, among other things, that there is a lack and a paucity of empirical research and sound data on suicide among the elderly [1,11]. Bauer, et al. [12], attribute this lack of sound research in the inherent difficulties of studying suicide in general and suicide among the elderly as well. The main difficulties are inherent to the phenomenon of suicide itself which is a low base rate and socially taboo phenomenon. The gathering of data about suicide focus on epidemiological studies, the psychological autopsy method, that is interviews with people from the social environment of the person that has committed suicide, clinical studies of survived attempters and the analysis of suicide notes or other suicide-relevant personal documents. The main methodological issues in conducting research in suicide are that it is a low base rate phenomenon, completed suicide can only be studied retrospectively, suicide deaths are usually underreported and/or under-recognized, information from non-fatal attempters and other informants may be distorted, and the utilization of adequate or comparison groups is not always employed, while there is a reliance on parasuicides (Figure 1).

Depression

Conwell & Brent [1] in a review of studies of completed suicides of elderly people using the psychological autopsy method found that between one half to two thirds of the elderly suffered from major depression, while bipolar illness and non-affective psychoses were almost absent. Sandilands & Bateman [13] report that overall the prevalence of depression is significantly higher among elderly people who commit suicide in comparison to younger age groups, while depressed individuals are over represented among elderly suicide victims [4]. Snowden, after reviewing the files of 210 elderly people who committed suicide reports that for 53% of victims, main reason for the suicide was depression [14].

More evidence for the relationship of depression and suicide ideation, suicide attempts and completed suicide among the elderly is provided by Szanto, et al. [15] who studied issues regarding suicide among the elderly. According to Segal and McIntosh [16,17] in the Western world the phenomenon of suicide is more common among the elderly in comparison to the rest age groups. In addition, while suicide attempts are less among the elderly, the elderly have more changes to complete and ‘successful’ suicide in comparison to the other age groups. As expected the most common disease diagnosed among the elderly who attempt suicide is major depression, and suicide attempts among the elderly are characterized by a lack of impulsivity, by a high degree of premeditation, planning and cognitive elaboration occupation, by means which are especially lethal and reduce the likelihood that they could be saved as they usually use guns and substances. Risk factors for suicide among the elderly are mainly medical illnesses, social isolation and major depression, which is a risk factor for all age groups [16]. Elderly men have significantly more chances in comparison to elderly women to have a complete suicide and after the age of 85 the chances of a suicide among the elderly men in comparison to elderly women is 53:1, thus a dramatic increase of the chances among the elderly men is observed, while there is a modest increase among the elderly women. In addition especially among the elderly we observe an indirect self-destructive behavior where either consciously or unconsciously there is an intention of the elderly to cause their death. This is usually done with no compliance to their medical prescriptions and taking their medication, and with denial of taking food and water, and these behaviors are usually seen in elderly homes, where the means of suicide are restricted and among the elderly whose religion considers suicide as a sin.

Among the depressed elderly some are at higher risk for suicidal ideation and behaviour. Data on this issue are provided by [18] in a study of 354 depressed patients aged 61 to 93 years about the clinical determinants of suicidal ideation and behavior in geriatric depression. The results of the study indicated that among the depressed elderly people those with severe depression, a history of suicide attempts with serious intent and limited social support were the most at risk to have suicidal ideation, with the stronger predictor being the severity of depression. Bonnewyn, et al. [19] in a review of studies between 2000 and 2009 about suicide in later life, who note that major depression, is a robust correlate of completed suicide among the elderly exerting an effect independently of other factors.

Chronic pain

Chronic pain is a rather common experience of older people and appears to be a risk factor for suicidality. Tang & Crane [20] report that patients suffering from chronic pain appear to have at least double chances of risk of death by suicide in comparison to the general population, with a pain center in the U.S.A. calculating that the prevalence of completed suicides among patients of the center to be 23/100.000, almost between 2-3 times higher in comparison to the general population. Suicidality in chronic pain has been found to be a function of the characteristics of the pain as type, intensity, duration of pain and insomnia co-occurring with pain.

Medical illness

A related to chronic pain risk factor is the presence of a medical illness as a precipitating factor for an elevated risk of suicide among the elderly. This association is usually inferred by anecdotal evidence and description of case studies. Evidence, however for a link between medical illness and suicidality among the elderly comes from a population based case control study of adults aged over 65 by Juurlink, et al. [21]. It was found that severe pain, major depression and bipolar disorder were strongly related with the largest increases in elevated suicide risk. It is worth noting that this pattern of associations remained unchanged even after statistical adjustment for the presence of other illnesses. The results are consistent with the above mentioned data indicative of an association between chronic pain and suicidality among the elderly. Other medical conditions associated with suicide among the sample of the elderly include congestive heart
failure, chronic lung disease, hyperacidity syndromes, seizure disorder, Parkinson disease, urinary incontinence, psychoses and agitation, anxiety and sleep disorders and moderate pain. In addition, as expected, it was found that the co-existence of multiple illnesses had a cumulative effect in increasing the risk of suicide, so patients with three illnesses had a 3-fold increase in the risk of suicide and those with five illnesses had a 5-fold increase in the risk of suicide, in comparison with patients with no illness. Similar results are reported by Fiske, et al. [22] in an evaluative review of the association of physical health condition and suicide among the elderly. The review showed that there is a relation of physical illness and an elevated risk of suicide among the elderly, with a variability of the risk according to the disease. Overall the medical illnesses that increased risk of suicide among the elderly are cancer, seizure, pulmonary disorders, genitourinary conditions, sensory impairment, insomnia congestive heart failure and cognitive impairment. In addition [23] in a large psychological autopsy study report that physical health problems were present in 82% of suicides among older people and in 62% of the cases medical illness contributed to suicide, with pain, breathlessness and functional limitation being the most frequent symptoms. Similar conclusions for a strong link between somatic illness and suicide among the elderly are reached by [14,19] in a review of studies between 2000 and 2009 about suicide in later life, who note that somatic illness is a robust correlate of completed suicide among the elderly exerting an effect independently of other factors, with a cumulative risk of multiple physical illnesses. Pain was the most common experience that was found and was responsible for the suicide of about 25% of the sample. The same pattern was found in younger samples, that is, the presence of a medical illness contributes to suicide ideation, suicide attempts and completed suicides, although the diseases mainly associated with suicidality in younger ages are mainly cancer and asthma [24]. The above mentioned risk factors are consistent with the propositions of Sandilands & Bateman [13] who also suggest that the link between medical illnesses and suicide could be mediated by depression.

Psychosocial factors

Snowdon [14] reports that among the factors associated with suicide in the old age are financial problems and reduced social status. Haw & Hawton [25] report that among patients admitted in general hospital with an episode of deliberate self-harm and living alone, social isolation was a considerable problem for those aged 55 and over, in comparison to people living with others, were more likely to have problems because of bereavement and were more likely to be widowed. Harwood, et al. [23] in one of the largest psychological autopsy studies of suicides among the elderly, report that bereavement, problems with accommodation (move into residential care), financial problems (mainly debt) and adjustment to retirement accompanied with loss of self-worth were all significant risk factors for suicide in comparison to the control group. Similar results are reported in a review study by Sandilands & Bateman about self-poisoning by older adults [13] and they note that suicide rate among the elderly is increased for those old people with limited levels of social contact and support, in need of assistance with tasks of daily living, family and marital discord and financial difficulties. Similar conclusions are drawn by Bonnewyn, Shad & Demyttenaere [19] in a review of studies between 2000 and 2009 about suicide in later life.

Prevention

Information about the prevention of suicide among the elderly is given by Mann, et al. [26] who conducted a systematic review of studies between 1966 and 2005 about several preventive interventions for the prevention and reduction of suicide. It was found that physician education in depression recognition and treatment and restricting access to lethal methods achieved a significant reduction in suicide rates. The laws and policies designed and implemented to impose control in the means of suicide as a meaningful way of reducing suicide have been also noted by Knox [27]. The evidence for other forms of interventions such as raising awareness through education aiming at the general public, screening, pharmacotherapy, psychotherapy, follow-up care after suicide attempts, media representations of suicide, is still inconclusive and more research is needed for their efficacy and effectiveness to be fully assessed.

The role of general practitioners in the assessment and management of suicide risk has been examined by Paxton [28]. Employing a quasi-experimental controlled before after design, with the development and implementation of specific standards for assessing and managing suicide risk included in a manual for guiding the practice of general practitioners, it was found that there was a significant improvement in general practitioners’ practices and beliefs in assessing and managing suicide risk. The study however depended on a small sample size and further research is needed given the importance of the subject and it would be even more interesting to examine whether such an intervention of further educating the general practitioners on assessment and management of suicide risk would have an effect on reducing the actual suicide rates.

The above mentioned results become even more meaningful in the frame of some other results by Luona [29] stating that almost half (45%) of the victims of suicide looked for and had contact with primary care professionals within one month before their suicide, and for older adults it was found that an even more higher percentage were in contact with primary care professionals within one month of suicide. Taken together the results of the studies mentioned so far make it clear that education of mental health and general practitioners in assessing and managing the risk of suicide among the elderly, and the rest of the age groups, seems a promising avenue as these professionals could act as gatekeepers for the assessment and management of suicide risk, as a large proportion of people finally committing suicide are seeking contact with them shortly before the suicide act [19]. The number of people seeking contact with mental health and primary care providers becomes even more higher if we extent the time frame within which the contact is made, that is about 75% of the suicide victims had had contact with a primary care provider within the year before the suicide act [29].

Szanto [15] actually tested such a proposition that is, the effectiveness of a depressive management educational program for general practitioners as a suicide prevention program, with the participation of 28 general practitioners who served
73000 people. The results indicated that there was a significant reduction of suicide rates for the region in comparison with national rates. Similar results are reported by Hegerl [30] in a community intervention targeting depression and suicidal acts where in two intervention years there was a reduction of fatal and non-fatal suicidal acts by 24%, in comparison to the control area, followed by a further decrease (-32% in comparison to the baseline year) in the follow-up year.

Oyama, [31] in a meta-analytic study of the effect of community-based interventions using depression screening on the elderly suicide risk, report that when these prevention programs of community based depression screening combined with health education have a significant reduction effect of completed suicide among the elderly. The authors further state that when the main follow-up activity was conducted by a psychiatrist rather than a general practitioner the reduction of suicide for the elderly population was even more successful, mainly due to the different approaches followed by the two groups of professionals in the management of depression. Overall prevention of suicide based on management and treatment of depression are among the interventions that seem promising in reducing the rates of suicide among the elderly and other age groups [27].

Overall and regarding the treatment of depression as a way of reducing suicide rates, Baldwin [32] argued that ‘clearly, appropriate detection and adequate management of depressive disorder, especially within primary care, remain a priority for suicide prevention in older people however a broad-based public health approach may be appropriate perhaps it is time to rethink a ‘healthy living’ strategy for suicide prevention too’.

Primary care physicians have another mean for preventing suicide in suicidal patients that is no-suicide contracts. Kelly & Knudson [33] describe this method as ‘the use of a document that includes the patient’s statement that, until the next scheduled appointment, he or she agrees to not harm himself or herself in any way or not attempt suicide’. In addition they note that it is a widely accepted method, although it should never replace a formal suicide assessment. Moreover there is no empirical evidence so far that describes the effectiveness and efficacy of the method in the prevention of suicide among suicidal people. Despite that lack of evidence Kelly & Knudson [33] propose that ‘use of such contracts may serve several useful purposes, including fostering a therapeutic alliance between the clinician and patient and assisting in suicide assessment’.

Tiihomen, [34] in a nationwide cohort study in which all subjects without psychosis hospitalized because of a suicide attempt, a total of 15390 patients, were followed up, with a mean follow-up of 3.4 years. Tiihomen et al [34] concluded that there is an increased risk of suicide attempts in the course of all antidepressant treatments, the use of antidepressants is not related with an increased risk of suicide, antidepressant use is related with a decrease in total mortality and while use of antidepressants was related with an increase in the risk of suicide attempts, use of antidepressants was also related with a decreased risk of completed suicide and mortality. Overall rate of mortality among suicidal patients could be reduced due to antidepressant treatment. Similar results are reported by Goldney [35] in a review of suicide prevention studies and the role of medication in managing depression and preventing suicide.

As a considerable number of old people are in contact with mental health and primary care professionals within a short time prior to their suicide, Rudd [36] report the need for mental health and mainly primary care professionals to be able to detect and recognize the suicide warning signs in the patients, mainly the observable signs of hopelessness. Rudd summarize [36] these signs as follow:

- Noncompliance with treatment (medications and/or psychotherapy)
- Refusal to access care during emergencies
- Little engagement during sessions
- Refusal to complete therapy homework
- Refusal to agree to a safety or crisis response plan
- Detailed and specific suicidal thoughts
- Preparation behaviors (e.g. letter of journal writing, purchasing life insurance, organizing a will)
- Rehearsal behaviors (e.g. accessing and reviewing a method for dying)
- Refusal to turn over identified methods
- Persistent recklessness and risk taking behaviors
- Ongoing substance abuse (when previous suicidality has emerged during periods of intoxication
- An inability to provide reasons for living.

SUMMARY AND RECOMMENDATIONS

Overall it is obvious that we should emphasize on the prevention and managing of the factors related with depression, as effective dealing and management of medical illnesses and management of pain which often accompanies medical illnesses, especially chronic illnesses. In addition the management of social isolation which usually face the elderly, with the motivation of behaviors which lead to social inclusion and social interest, the motivation of the proximal and distal social environment, the functioning of agencies of open care and places of socialization. In addition treatment of depression among the elderly should be a priority as it is usually related in this age group with bereavement and/or losses of every form. Finally there is a need for the development of psychometric measures which would be able to detect with validity and reliability suicide ideation and intention of suicide among the elderly, and of course prevention through detection of the elderly at risk of suicide by the medical, paramedical and mental health personnel. Lapierre et al [37] overall state that programs aiming at high risk seniors attained positive outcomes, with reductions of the levels of suicidal ideation and overall suicide rates at the communities which participated in the interventions. A very interesting finding useful for the prevention of suicide among the elderly is the fact that an extremely high percentage of the 93% of the elderly, who committed suicide, had a history of psychiatric care during their
lives either as inpatients or outpatients and clients of mental health agencies during their lives. Baldwin [32] argued that this is a necessary condition for the prevention of suicide among the elderly, however it is not a sufficient condition, and the enhancement of the general well-being of the elderly should be a priority based on a social policy of primary prevention through overall healthy living.

Baldwin [32] argued for a social policy perspective founded on a primary prevention basis of healthy living. According to Cowen & Durlak [38] policies of primary prevention mainly have two basic aims 1) to prevent adverse negative outcomes and 2) build health and wellness from the start and maintain it. Design and implementation of existing and future interventions aiming at reducing suicide rates could be further improved and enriched if they take into consideration some principles of implementation derived from primary prevention. Cowen & Durlak [38,39] summarise these as follows: 1) policies should be maximally consistent and comprehensive, 2) it is often more effective to develop policies that promote competence instead of ones that seek to reduce negative behaviors, 3) effective implementation is essential for maximum policy impact, 4) the impact of social policies should be re-evaluated periodically and modified when necessary and 5) policies should encourage the adoption of empirically supported interventions.’

REFERENCES


