

# Deliberate Self-Harm in Older Adults: A General Hospital Emergency Department Survey

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**ABSTRACT:** **Background:** Deliberate self-harm (DSH) increases the danger of future suicide death and the risk increases with age. Self-harm in older adults is often associated with greater suicidal intent and lethality.

**Objectives:** To investigate the clinical and psychosocial variables of older patients (age  $\geq 65$  years) assessed due to DSH, compared with younger adults.

**Methods:** Patients admitted to the Emergency Department following DSH during an 8 year period were included.

**Results:** Of 1149 participants, 187 (16.6%) were older adults (age  $\geq 65$ ) and 962 (83.4%) were younger adults ( $< 65$ ). The older adults reported DSH occurring closer to mid-day ( $P < 0.01$ ) and suffered more frequently from adjustment disorder and depression than did younger adults. Personality disorders and schizophrenia were less commonly diagnosed ( $P < 0.001$ ). Prescription medication (sedatives and hypnotics) were a more frequent means (88% vs. 71%) of DSH among older patients. Younger patients with DSH used over-the-counter medications (21.9% vs. 6.4%) three times more than did the older patients ( $P < 0.01$ ). Past DSH was significantly more frequent in younger adults. Following DSH the older patients were frequently admitted for further general hospitalization ( $P < 0.001$ ).

**Conclusions:** Older adults with DSH are a unique group with different clinical characteristics. There is a need for targeted prevention strategies and education of caregivers regarding DSH in older adults.

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**KEY WORDS:** self-harm, older adults, emergency department (ER), suicide attempt, self-injury

intended to lessen painful feelings or communicate distress [1]. Several research groups have claimed that the differentiation between non-suicidal self-injury and attempted suicide is artificial [2]. Deliberate self-harm (DSH) increases the danger of future suicide death and the risk increases with age [3-5]. Self-harm is the strongest risk factor for completed suicide, especially in old age [6,7]. Suicidal attempts in older adults are often associated with greater suicidal intent and lethality [8].

Older adults ( $\geq 65$  years) have high complete suicide rates in many countries [9]. Data from Israel's Ministry of Health are similar to international reports of self-harm, consistently peaking among the young and declining with increasing age [10]. Aging is associated with greater resolve to die and with death resulting from the attempt [11-13]. The ratio of self-harm episodes to completed suicides in older adults is much lower than in younger age groups [11-13]. Thus, for older adults, it is more accurate to assume that self-harm indicates failed suicide, as these incidents are similar in character to completed suicides.

Although suicidal behavior is a public health problem in Israel, there has been limited information on self-harm among older adults. In Israel and the Western world, old age has consistently been shown to be a significant risk factor for completed suicide. The present study reports findings on self-harm in subjects 65 years of age and older in Israel. The data were collected from our Emergency Department (ER) and thus reflected the most severe self-harm attempts in the Israeli population.

## PATIENTS AND METHODS

In the present study DSH was defined as intentional self-poisoning or self-injury, irrespective of motivation or suicidal intent [14]. The Wolfson Medical Center is located in the city of Holon, south of the Tel Aviv district. This hospital is the only one serving citizens of Holon, Bat Yam, and south Tel Aviv (including Jaffa) – a catchment area of 500,000 citizens.

This prospective study was conducted in the ER at Wolfson Medical Center in Holon, Israel, during 8 years, from October 2003 to August 2010. Psychiatric evaluation was completed by

Self-harm is a term that encompasses all intentional acts of self-injury, irrespective of the degree of suicidal intent. It includes suicide attempts as well as acts without suicidal intent

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trained psychiatrists in the first 6 hours after arrival of the patient in the ER. The study was approved by the Institutional Review Board for clinical research at the Wolfson Medical Center.

Data were collected with the WHO/EURO Multicenter Study of Suicidal Behavior [11]. The questionnaire consists of 24 items including sociodemographic variables (gender, age, place of residence in the past year, marital status, household composition, education, nationality, economic situation), DSH method according to the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10) X-Code, date, previous DSH if applicable, arranged treatment procedures, and the preliminary diagnosis of mental disorders according to ICD-10 and any referrals to health facilities following the DSH. The assessment form was completed by the same trained psychiatrist who examined the patients in the ER. The diagnoses used in our study are in accordance with ICD-10.

We used three categories:

- **over-the-counter medication:** swallowing the following types of medications – non-narcotic pain sedatives, fever-reducing medication, and anti-rheumatic medication
- **prescription medication:** swallowing the following types of medications – sedatives, hypnotics, antidepressants, barbiturates and antipsychotic medications
- **violent self-harm:** all other forms of suicide including hanging, strangulating, jumping, cutting, and any form of physical damage.

Aftercare included five categories: no further treatment, psychiatric treatment (hospitalization/ambulatory) and non-psychiatric treatment (hospitalization/ambulatory).

Data were analyzed using a paired-sample and independent-sample approach. The two-tailed *t*-test and a non-parametric test were undertaken to evaluate differences between the evaluations for qualitative parameters. Examination of differences between the categorical parameters was based on the chi-square test and corrected by the Fisher's exact test. All tests were two-tailed, and a *P* value  $\geq 0.05$  was considered statistically significant. The data were analyzed using Statistical Analysis System software, version 6, 1990.

## RESULTS

Data were collected from 1210 participants. We excluded 61 cases from analysis due to missing data. Our final sample comprised 1149 patients aged 18 or older who had been assessed following DSH. Age range was 18–95 (mean  $43.1 \pm 19.5$  years). There were 187 older adults (16.6%) (mean age  $76.7 \pm 7.2$ , range 65–95) and 962 (83.4%) younger than 65 (mean age  $36.6 \pm 13.4$ , range 18–64).

The numbers of males (534, 46.4%) and females (597, 53.6%) were similar in our sample. In the older group there were 78 males (42.8%) and 104 females (57.2%). No significant

gender differences were obtained between the older and younger groups ( $\chi^2(1) = 1.65, P = 0.2$ ).

Marital status analysis revealed that the older adults had the largest percentage of widowers and the smallest number of singles ( $\chi^2(1) = 425.91, P < 0.001$ ) [Table 1].

Age difference analysis revealed two major significant findings. Older adults, compared to younger adults, were more frequently living by themselves. Furthermore, older adults were less frequently living with a family member ( $\chi^2(1) = 31.65, P < 0.001$ ) [Table 1].

The level of education was significantly higher in the younger group ( $\chi^2(1) = 1.32, P < 0.001$ ). A large number (70%) of the younger subjects were unable to work.

DSH among older adults was less common than expected for subjects who were born in Israel ( $\chi^2(1) = 342.59, P < 0.001$ ). However, it was more common than expected for subjects who were born in either Western or Eastern Europe.

The time of day when the DSH occurred was different between the two groups. Time of DSH was analyzed in two ways: a correlation analysis of time and participant's age (non-segmented) yielded a small yet significant correlation ( $r(1149) = 0.12, P < 0.001$ ). Older subjects reported DSH closer to mid-day more often than did young subjects. In addition, an independent sample *t*-test comparing the time of DSH between the groups revealed a significant difference ( $t(1147) = 2.8, P < 0.01$ ). Older adults reported self-harm occurring closer to mid-day more often than did the younger group. The day and month of DSH were not found to be statistically different between groups.

**Table 1.** Sociodemographic characteristics: n (%)

	Age (yr)		Significance
	18–64	65–95	
<b>Marital status</b>			
Single	446 (48.6)	5 (2.7)	<i>P</i> < 0.001
Widow	15 (1.6)	88 (48.6)	
Divorced or separated	272 (29.6)	24 (13.2)	
Married (or living with a mate)	184 (20)	64 (35)	
<b>Household composition</b>			
Living alone	310 (33)	101 (54.9)	<i>P</i> < 0.001
Living with family (parents/children/relatives)	606 (64.6)	81 (44)	
Other (institutions and other)	21 (2.2)	2 (1)	
<b>Employment</b>			
Employed	230 (27.6)	4 (2.3)	<i>P</i> < 0.001
Unemployed (temporarily)	14 (1.6)	1 (0.5)	
Unable to work	589 (70.7)	163 (97)	
<b>Education level</b>			
Elementary	455 (54.2)	131 (77.5)	<i>P</i> < 0.001
High school	352 (42)	34 (20.1)	
Academic	31 (3.6)	4 (2.3)	
<b>Country of origin</b>			
Israel	596 (62.4)	19 (10.2)	<i>P</i> < 0.001
Former Soviet Union	238 (24.9)	45 (24.1)	
Middle East, North Africa	80 (8.3)	59 (31.7)	
Eastern Europe	18 (1.8)	56 (30.1)	
Western Europe	18 (1.8)	7 (3.7)	
Other	4 (0.4)	–	

The exact number of people and their age distribution during the relevant period were collected from the Israel statistical information bureau [15]. DSH ratios (cases out of 100,000; based on data from this bureau for the years 2004–2009) were compared between older and younger age groups. No statistical differences were obtained ( $t(5) = 0.572$ ,  $P = 0.59$ ) between the older (mean  $45.28 \pm 6.85$  per 100,000) and the younger population (mean  $48.28 \pm 12.07$  per 100,000).

Older adults with DSH suffered more frequently (57.8%) from adjustment disorder compared with the younger group (only 46.7%). Depressive disorder was diagnosed in 21% of the older group, compared to only 6.2% of their younger counterparts.

Personality disorders were much less frequently diagnosed among older adults (4.3% vs. 18.2%), as was schizophrenia, which was less frequent among older adults (5.9% vs. 16.5%).

Only 2.9% of the younger participants suffered from alcohol use disorders vs. 1.6% among the older participants. In the younger group, 3.5% suffered from mental and behavioral disorders due to psychoactive substance use, whereas none of the older participants suffered from these disorders.

Overall, a significant difference in mental disorders distribution was demonstrated ( $\chi^2(8) = 134.54$ ,  $P < 0.001$ ) [Table 2].

Distribution differences in the analysis revealed ( $\chi^2(1) = 9.18$ ,  $P < 0.01$ ) a larger than expected number of older subjects (88% vs. 70.7%) who used prescription medication (sedatives and

hypnotics). Younger patients used over-the-counter medications (21.9% vs. 6.4%) threefold more often than older patients.

Analysis revealed ( $\chi^2(1) = 9.18$ ,  $P < 0.01$ ) a significant difference between the age groups, with past DSH being more frequent in younger than older adults [Table 2].

Older adults with DSH are less frequently admitted for further psychiatric hospitalization. Younger adults are more frequently not treated at all ( $\chi^2(1) = 23.12$ ,  $P < 0.001$ ) [Table 2]. Older adults are more frequently admitted for further general hospital inpatient care and more frequently receive ambulatory psychiatric treatment.

## DISCUSSION

Our study aimed to investigate differences in psychosocial variables and clinical characteristics of older adults with DSH who were admitted to an ER in Israel. We compared a large sample of patients aged 65 years and older with younger adults. Our findings suggest that the older group with DSH differs from the younger DSH group in several demographic and clinical characteristics.

Gender differences in DSH were found in Israel only in the age group 13–26 years [16]. Similar ratios and no statistically significant gender differences were found in our study between the older and younger groups.

Cultural differences between the two groups were substantial. The main cultural differences were educational background, which was higher in the younger group, and ethnic origin (most subjects in the younger group had been born in Israel). Higher education in the younger group was expected because of the progress in education level over the years. The diversity of ethnic origin in the older group was expected too, due to immigration to Israel during the previous century.

In 2009, the rate of suicide attempts in Israel in the age group 65–74 was 37.2 per 100,000 and 53.3 per 100,000 in the oldest old group (75 years or older) [10]. Similar rates of 45 per 100,000 were found in our study in the older group. These findings are in contrast to reports [11] that found a higher mean rate in the over 65 year old population, namely 61.4/100,000 measured in 15 European centers (range 32:100,000 to 116:100,000).

A unique finding in our study is the time of day when the DSH occurred. Older subjects reported DSH closer to mid-day. Very little has been published about diurnal variations in timing of DSH. Even when prevention programs are devised, timing is not emphasized [17]. Cebria and colleagues [17] suggested that older people find mid-day the time to attempt suicide due to their routine as retirees, knowing that there is a small chance of being found by younger family members who are still working.

As demonstrated in previous studies [12,18], the majority of older adults use non-violent means in suicide attempts. Our study, similar to previous studies [19,20], suggests that it is more common among older adults to swallow prescribed

**Table 2.** Clinical characteristics of older adults vs. younger adults with deliberate self-harm: n (%)

	Age 18–64	Age 65+	Significance	
<b>Psychiatric disorder n (%)</b>				
Mental retardation	5 (0.5)	–	$P < 0.001$	
Personality disorders	175 (18.2)	8 (4.3)		
Adjustment disorder	447 (46.7)	107 (57.8)		
Anxiety disorders	2 (0.21)	–		
Depressive episode	60 (6.2)	39 (21)		
Bipolar affective disorder	12 (1.2)	1 (0.5)		
Schizophrenia	158 (16.5)	11 (5.9)		
Drug abuse/dependence	34 (3.5)	–		
Alcohol abuse/dependence	28 (2.9)	3 (1.6)		
Psychiatric disorder due to medical condition	3 (0.3)	1 (0.5)		
Other	55 (5.6)	5 (2)		
Dementia	3 (0.3)	13 (7)		
<b>Suicide methods</b>				
Swallowing over-the-counter drugs (paracetamol and NSAIDs)	210 (21.9)	12 (6.4)		$P < 0.01$
Swallowing prescription drugs (sedatives, hypnotic drugs)	676 (70.7)	165 (88)		
Self-injury by violent means (hanging, cutting)	70 (7.3)	10 (5.3)		
<b>Previous attempts</b>				
Yes	343 (36)	5 (24.4)	$P < 0.01$	
<b>Aftercare</b>				
Ambulatory psychiatric treatment	448 (48.3)	102 (56.6)	$P < 0.001$	
Psychiatric hospitalization	144 (15.5)	12 (6.6)		
Ambulatory non-psychiatric treatment	16 (1.7)	3 (1.6)		
Non-psychiatric hospitalization (in general hospital)	272 (29.3)	63 (35)		
No treatment	47 (5)	–		

NSAIDs = non-steroidal anti-inflammatory drugs

drugs, perhaps because they have more accessibility to prescribed medications due to their physical illnesses and a more lethal intent of their suicide attempt or self-harm.

Our findings demonstrated that the older group suffered more from adjustment disorder, depressive episode and dementia, whereas the younger group had been more frequently diagnosed with personality disorders, schizophrenia and drug/alcohol use disorders. These results are in accordance with the observations of De Leo and colleagues [11] who found a preponderance of depressive disorders with a relatively low number of personality, substance abuse and schizophrenia-spectrum illnesses in an elderly sample.

More than 35% of the older adults with DSH were later admitted to a general hospital ward, a slightly higher rate than the younger group. Gibb and colleagues [21] found that those making suicide attempts requiring hospital admission are at high risk of further hospitalization for suicide attempt and of death from suicide. Younger patients were referred to psychiatric hospitalization more than twice the rate of older patients.

#### LIMITATIONS OF OUR STUDY

First, our study cohort was based on an urban population. Different outcomes may be expected in rural-based populations, although a majority of the Israeli population lives in urban environments. Second, our study was based on general hospital ER patients and thus may not generalize to outpatients, psychiatric centers or nursing homes. Finally, in order to isolate specific risk factors for attempted suicide, comparison to a control group is needed.

The strengths of the study are the unique epidemiological data on older DSH patients in Israel presented here. To the best of our knowledge, this is the first attempt to clarify psychosocial and medical features of an older DSH group in Israel. Our findings may be useful for suicide prevention in Israel and may be generalized to other countries. Identifying at-risk groups will help to develop local prevention strategies and contribute to the effort to reduce mortality due to suicide among older adults.

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### “Those who put out the people’s eyes, reproach them for their blindness”

John Milton (1608-1674), British poet, polemicist, man of letters, and civil servant for the Commonwealth of England under Oliver Cromwell. He wrote at a time of religious flux and political upheaval, and is best known for his epic poem *Paradise Lost*.

Milton's poetry and prose reflect deep personal convictions, a passion for freedom and self-determination, and the urgent issues and political turbulence of his day. He wrote in English, Latin, Greek, and Italian