

Suicide among Swedish Dentists

A Ten-Year Follow-Up Study

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In the present study, we have followed a national cohort of dentists, academics, i.e. people with three or more years of post-high school education, and the general population for a period of ten years, and identified all cases of recognized suicide during the period 1961 to 1970. The aim of the study was to assess whether suicide rates are higher among dentists even after adjustment for socioeconomic factors. Results show an elevated standardized mortality ratio (SMR) for male dentists compared to other male academics. Female dentists did not exhibit any increased risk. It is suggested that enhanced interest should be given to the possible etiologic role of not only psychosocial factors but also to psychoorganic consequences of mercury exposure among dentists.

Key words: suicide, dentists, general population, academics, organic and psychosocial risk factors.

A number of studies have dealt with the question whether suicide rates are elevated among dentists. Some of which find an elevated risk while other do not (1-6). Previously published reports typically deal with a subpopulation of dentists and do not address the question on a national level. Furthermore, most studies compare with that observed in the general population and fail to standardize rates to that observed among other professionals. Suicide, naturally, is a difficult subject to study and under-reporting has been listed to be as high as 33% (7).

Aside from these general concerns, health care

professionals are, in general, more familiar with various suicide methods. Such knowledge may lead to a higher completion rate when suicide is attempted compared with the general population. Personality selection as well as work-related stress have been suggested to explain the elevated suicide rate found among, for example, physicians (8). Whether the same factors act on dentists are as of yet not known.

Recently, findings of elevated concentrations of mercury in the central nervous system of dentists were reported (9, 10). Emotional changes and depressive mood are commonly observed among subjects poisoned by inorganic mercury compounds (11). Thus, such psychorganic changes may be a contributory cause of suicide among dentists.

The aim with the present study was to assess suicide rates among the national Swedish cohort of dentists for the period 1961 to 1970 and compare these with not only the general population but also to socioeconomically comparative groups. Aside from mere rates, we also assessed possible differences between these groups with regard to methodology used to commit suicide.

METHODS

The total population of dentists living in Sweden in 1960 was identified in the compulsory National Census carried out between October 2-8, 1960. It is compulsory by law to participate in the regularly occurring censuses for all people registered as living in Sweden at the time of the census. Response rate is approximately 98.3%. Dentists are identified by a unique code. In 1960, Sweden had 3 585 male and 1 150 female dentists. The total population consisted of 3 700 000 men and women, respectively. In order to relate suicide rates among dentists to a more comparative group we also identified all Swedes with three or more

Table I. Standardized mortality ratios (SMR) for dentists compared to other academics as well as the general population

95% confidence interval, c.i.^a

	Dentists compared to			
	Other academics		The general population	
	Men	Women	Men	Women
Obs. no.	18	2	18	2
Exp. no.	9.9	2.4	15.1	2.1
SMRs	1.8	0.8	1.2	0.9
95% c.i.	1.1-2.9	0.1-2.9	0.7-1.9	0.1-3.4

^a In all cases but for one male, dentists committed suicide prior to age 65. SMRs standardized for age and region and are based on the total cohort.

years of post-high school education, in short called "academics". This group comprised the following occupations: architects, engineers, chemists, physicists, geologists, meteorologists, veterinarians, biologists, university and college professors and teachers, priests, judges, lawyers, librarians, psychologists, pilots, accountants, prosecutors, and higher ranking police officers. The group consisted of 210 000 men and 43 000 women.

The three cohorts—dentists, academics and the total population—were assessed during the period 1961 through 1970. All suicides occurring during the period were classified in accordance with the seventh and eighth revision of the WHO International Lists of Diseases and Causes of Death (ICD7 970.0-979.9 and ICD8 950.0-959.9). Cases where death could not with certainty be ascribed as being either accidents or intentional (E980-989) were also reviewed. Cases of suicides were identified by checking the total cohort against the national cause-of-death registry for the period studied.

The sex specific age (five-year birth cohorts) standardized mortality ratios (SMR) for suicides were calculated. SMR is the ratio between observed numbers of suicide over expected numbers, which would have been expected if the study group have had the same rates as that observed in the comparison group. Suicide ratios were also adjusted for region, using three metropolitan areas and 24 counties in an indirect standardization. Since the study population was large and the suicide rate small, the number of suicides was assumed to make a Poisson distribution when calculating 95% confidence intervals (12).

Classification of various occupational cohorts in the 1960 census was based on standards from the International Labour Office and the United Nations (13, 14).

RESULTS

Table I depicts standardized mortality ratios for suicide among dentists compared to other academics as well as to the general population. Out of a

total of 20 suicides among dentists (18 men), only one male dentist committed suicide after 64 years of age. The table clearly shows an elevated suicide rate for male dentists compared to other academics, but not compared to the general male population. For female dentists no differences from the expected rates were found.

There was a tendency to an age-related increase in number of suicides to age 60. However, due to the overall limit of suicide cases, no clearcut conclusion may be drawn.

Only two cases where intention behind the death was unknown occurred among male dentists, one of which occurred prior to age sixty-five. The expected number was even smaller (0.4), but does not warrant the calculation of confidence intervals.

Academics in general, compared to the general population, exhibited a standardized mortality ratio for suicide of 0.6 (95%, c.i.; 0.5-0.7) for men and 1.2 (1.0-1.5) for women. A total of 659 male and 78 female academics committed suicide during the 10-year follow-up period. Out of these only 19 male and 2 female academics committed suicide after age 64. Thus, for male academics suicide rates were clearly lower while female academics did not differ from the general population.

DISCUSSION

No previously published study has analyzed suicide incidences for dentists on a national scale while at the same time using not only the general population, but also other academics as standard populations. Furthermore, previously published studies deal with retrospective data or, for example, a certain geographic region of a nation (1-6). In the present study, we have followed all dentists identified in the 1960 national census for the next 10-year period. The study shows that suicide rates among dentists are similar to that of the general Swedish population regardless of sex. Male dentists, however, exhibit an almost two-fold elevation in suicide rates compared to other male academics. This finding indicates that personal and environmental factors protect male academics from suicidal behavior to a greater degree than what is found for the general population. However, male dentists, apparently, do not share these beneficial aspects of the academic world.

The present study is based on all dentists identified in the 1960 national census. Figures found in

that census is well in line with other official figures of the size of dentists at that time. Theoretically, a person actually being a dentist by profession, but working as a researcher or administrator might have reported a different occupation. However, such a misclassification is not likely to influence our findings. Furthermore, since rates are elevated in the dental profession, changing to another occupation is more likely to decrease than increase the rates for dentists. It is also possible that we did not find all deceased dentists. If a dentist emigrates and his death is not reported in Sweden, no official death certificate will exist in Sweden. However, the total number of such cases is likely to be small and actually decrease SMR rates as a consequence of nondifferential misclassification.

We do not have sufficient knowledge about dentists' personality and occupational environment to explain these data. Certain commentaries of the data are in place:

Our data indicate that Swedish dentists along with Swedish physicians make up a high risk group for suicide (8). Selection of subjects with depressive personality disorders have been attributed to the high suicide rate found among physicians as has psychosocial stress inherent of medical practice (8). Whether similar factors apply to dentists have not been determined.

However, recent data indicate an accumulation of total mercury in the central nervous system of dentists. This is especially noticed in the pituitary, and is partly due to be in addition to the accumulation believed to be caused by a person's amalgam fillings (9, 10). Build-up of inorganic mercury may lead to emotional changes and depressive disorders with a consequent increase in suicide attempts (8).

Suicide methodology did not differ between groups and we did not find any evidence indicating a higher proportion of E980-989 diagnoses, that is, when it is unclear whether death was intentional or accidental.

In conclusion, our study shows that Swedish male dentists, part of the census of 1960, exhibit an almost two-fold elevation in suicide rates compared to other academics. We still lack sufficient data to explain these high rates. It is, however, of interest to notice that the other high risk profession for suicide, physicians, is also found within the health care section (8). The possible role of occupational exposure to mercury as a contributory risk factor of suicidal behavior warrants further attention. Natu-

rally, this does not rule out the need to assess more traditional risk factors of suicidal behaviour, such as psychosocial factors and personality (8, 15).

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