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BRIEF COMMUNICATION

The relation between suicidal feelings and mental disorders in the elderly: results from the Berlin Aging Study (BASE)

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ABSTRACT

Background. The purpose of this study was to demonstrate the influence of several risk factors (particularly physical and mental disorders, loneliness and housing conditions) on the wish to die in the elderly.

Method. Using data from a population-based sample of 516 senior citizens (70 to 103 years of age) in Berlin (Germany), we compared 54 persons with death wishes with 462 persons without death wishes on several psychosocial risk factors, physical health and psychiatric diagnoses. A logistic regression analysis was also conducted.

Results. The data indicate that the wish to die is strongly associated with the presence of a mental disorder, especially major depression, while higher age, female gender, subjective assessment of physical health and negative living conditions were all only moderately related to death wishes.

Conclusions. Our results emphasize the need for very careful diagnosis of death wishes in the very old and question the view that it is a normal and understandable phenomenon in older age.

INTRODUCTION

Several authors and clinicians regard the wish to die in old age primarily as a 'normal', understandable phenomenon, citing 'age-group typical negative life circumstances' such as loneliness, physical illnesses (Roy, 1982), marital status (not married) and low socio-economic status (Dodge & Austin, 1990; Clark, 1991) as being related to death wishes in the elderly (Lindner-Braun, 1990; Diekstra, 1996). This viewpoint is, however, not supported by empirical data. For example, several studies on elderly persons who expressed death wishes, revealed mental disorders, especially depression (Linden & Barnow, 1997; Alexopoulos *et al.* 1999; Barnow & Linden, 2000, 2001; Waern *et al.* 2002) as significant risk factors associated with the wish to die. Also, it has to be pointed out that the rate of suicidal acts shows a linear decline over the life-span with the elderly being the least prone to making suicidal attempts (Linden & Barnow, 1997).

The disagreement might come from several issues. First, few studies assessed death wishes in the elderly by using standardized instruments and structured interviews, and even fewer studies investigated this topic using non-clinical samples that included very old persons (aged $\geqslant$85). Secondly, so far as we are aware, no study controlled their results with regard to the association between death wishes and negative life circumstances in the elderly for potentially confounding factors such as physical diseases and mental disorders.

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In the Berlin Aging Study (Baltes & Mayer, 1999), we were able to address the methodological difficulties cited above. We investigated 516 old (70–84 years) and very old persons (85–103 years) out of a population-based sample with respect to the frequency of death wishes in relation to negative life circumstances, mental disorders and a variety of potentially influencing factors. Specifically, the following questions were examined. Do elderly persons with death wishes ($N=54$; age range 70–103 years) differ with respect to demographic characteristics (e.g. age, gender, years of education) physical and mental health and extent of social and emotional loneliness from persons without death wishes? Which of the significant factors can be replicated in a logistic regression analysis when several confounding factors are controlled? What are the consequences of our findings with respect to the treatment of elderly persons with death wishes?

METHOD

Sample

The Berlin Aging Study (BASE) is an interdisciplinary study of a representative sample of 516 old and very old persons (70–103 years of age) in Berlin. In general, every participant underwent 15 sessions of assessment, including a thorough examination by a psychiatrist using clinical as well as standardized assessment procedures. It was, therefore, possible to study suicidal ideation in a representative community sample of very old persons and to describe and verify psychiatric morbidity using self-rating scales, observer-ratings scales, standardized diagnostic classification according to the algorithms of DSM-III-R (American Psychiatric Association, 1987) and also clinical judgement. Furthermore, it was possible to obtain information on health status, individual living conditions and outlook. The sample was stratified according to 5-year age groups and gender, resulting in 12 groups with 43 persons. This allows statements to be made about groups that are typically under-represented in non-stratified population samples (e.g. very old (i.e. aged $\geqslant 85$) males). The selection process and selectivity in BASE are discussed in detail elsewhere (Lindenberger *et al.* 1999).

Instruments

The Hamilton Depression Rating Scale (HAM-D) (Hamilton, 1960) and the Geriatric Mental State Examination (GMS-A, 3rd edn) (Copeland *et al.* 1988) were used to identify death wishes and suicidal ideation. In order to separate the suicidal group from the whole sample, all cases were selected that were rated by the psychiatrist as having the actual wish to die or suicidal ideation according to the HAM-D (category 2–4) or GMS-A (three items). The resulting group (Group 2) included 54 persons with at least one positive rating in one of the two instruments (for more information see Linden & Barnow, 1997). The comparison group was recruited from the remaining sample of non-suicidal elderly persons (Group 1, $N=462$).

In order to describe the social living situation of participants, the number of years of schooling/education, the equivalent income, the marital status, the size of the social network, the housing condition, and the perceived degree of social and emotional loneliness were determined for each subject. The subjective assessment of social and emotional loneliness was measured using a short version of the UCLA Loneliness Scale (Russel *et al.* 1984). Equivalent income was computed as net per capita income, adjusted to account for the number of members of a subject's household. The size of the social network was derived from the number of persons each subject identified as being close to him/her at the time of the study (Kahn & Antonucci, 1980).

Physical health was evaluated on the basis of participant's subjective assessment of his or her health using a Likert-type scale from 1 (poor) to 5 (very good), the ADL score (Activities of Daily Living) (Mahoney & Barthel, 1965) and the number of diagnosed physical disorders based on physician assessment and weighted by degree of severity. The medical examination schedule included physical examination, blood sampling, functional assessment and technical procedures (e.g. electrocardiography, spirometry and audiometry) on almost all participants ($N=504$). The classification was carried out according to the criteria of ICD-9 (WHO, 1988). For every diagnosed illness, consensus ratings were made for certainty of diagnosis and medical severity. In this study, we only

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Table 1. *Characteristics of participants without* (*Group* 1) *and with* (*Group* 2) *death wishes*

Factors	Group 1: persons without death wishes $N=462$	Group 2: persons with suicidality $N=54$ ($N=8$)	Statistics
Mean age	84·37	89·58 (8·0)	$F=18·1$**
[S.D.]	[8·5]	[90·41] [(8·8)]	($F=3·8$*)
Male, %	51·9	33·3 (25·0)	$\chi^2=6·7$*
			($\chi^2=2·2$)
Family status, %			
Married	31·6	14·8 (12·5)	
Widowed	53·7	64·8 (87·5)	$\chi^2=6·7$
Divorced	7·1	9·3 (0·0)	($\chi^2=3·8$)
Single	7·6	11·1 (0·0)	
Self-rated mental health, %			
Very good	14·8	13·7 (12·5)	
Good	50·0	44·8 (50·0)	
Satisfactory	24·1	23·5 (0·0)	$\chi^2=1·9$
Acceptable	7·4	13·7 (25·0)	($\chi^2=3·8$)
Poor	3·7	4·3 (12·5)	
Self-rated physical health, %			
Very good	5·4	3·7 (0·0)	
Good	27·5	13·0 (0·0)	
Satisfactory	37·7	33·3 (25·0)	$\chi^2=28·9$**
Acceptable	18·2	13·0 (25·0)	($\chi^2=13·3$**)
Poor	11·1	37·0 (50·0)	
ADL score, %			
Completely dependent upon help	3·2	3·7 (12·5)	
Almost completely dependent	3·0	3·7 (0·0)	
Primarily dependent	1·9	3·7 (12·5)	$\chi^2=24·1$**
Partially dependent	3·2	9·3 (0·0)	($\chi^2=6·9$)
Primarily self-reliant	9·5	27·8 (12·5)	
Completely self-reliant	79·0	51·9 (62·5)	
Residence, %			
Private home/apartment	81·2	64·8 (75·0)	
Senior citizens' complex	6·5	9·3 (0·0)	$\chi^2=9·6$*
Senior citizens' home	5·6	14·8 (12·5)	($\chi^2=4·3$)
Nursing home	6·7	11·1 (12·5)	

Values in parentheses for persons with suicidal thoughts/attempts ($N=8$).
* $P<0·05$; ** $P<0·01$, all values two-tailed.

considered moderate to severe internal, neurological, or orthopedic diseases (for more information see Steinhagen-Thiessen & Borchelt, 1999). Additionally, participants were asked to give a subjective assessment of their mental health on a five-point Likert-type scale from 1 (poor) to 5 (very good).

Depressive mood was assessed by means of the Center for Epidemiologic Studies Depression Scale (CES-D, German version) (Hautzinger, 1988). Finally, DSM-III-R diagnoses of psychiatric disorders were ascertained by an experienced psychiatrist on the basis of the GSM-A interview.

Statistics

The χ^2 test for significance in contingency tables and a multivariate analysis of variance (MANOVA) were used to identify differences between participants in the two groups.

In order to establish the extent to which the presence of the risk factors cited above permitted allocation to Group 1 or Group 2, a logistical regression analysis (LRA) was calculated.

RESULTS

Participants with death wishes and/or suicidal ideation (Group 2) were significantly older and more often female than those without death wishes (see Table 1). Taking the possibility into account that the results of the comparisons between Group 1 and Group 2 were influenced by the higher age in Group 2, we controlled the MANOVA for participant age by including it as a covariate. The MANOVA revealed, however,

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no significant differences with respect to income, education, emotional and social loneliness, the number of diagnoses of physical disorders or the size of the social network (not shown), whereas suicidal participants had higher mean CES-D scores (26·9 (9·55) *v.* 12·7 (8·26), $F=121{\cdot}1$, df = 1, 514, $P<0{\cdot}01$). Results of χ^2 tests show that participants with death wishes assessed their own health as significantly poorer, were more often classified as requiring help in the ADL, and were more often residents of nursing or senior citizens' homes (see Table 1).

Considering the fact that the suicidal group was comprised of persons with mild to severe suicidality we re-evaluated the group comparisons by looking at the eight persons with severe suicidality (suicidal thoughts/attempts). This analysis confirmed age and self-rated physical health as being significantly associated with suicidality while the distributions of the ADL score and the living situation were in the expected direction (with more suicidal persons living in nursing homes and less suicidal persons were rated as completely selfreliant) without reaching significance (results are given in brackets).

With respect to the diagnoses of psychiatric disorders included in this study (drug/alcohol abuse/dependence, anxiety disorders, dementia, dystymia, major depression), the participants in Group 2 (with death wishes) showed a higher prevalence of major depression (0·9% *v.* 35·2%, $\chi^2=132{\cdot}26$, df = 1, 514, $P<0{\cdot}01$) and had more frequently received a DSM-III-R diagnosis (specified and unspecified) (40·3% *v.* 96·3%, $\chi^2=61{\cdot}10$, df = 1, 514, $P<0{\cdot}01$).

In interpreting the results, it is important to remember that the data shown in Table 1 indicated that age and gender are related to the occurrence of death wishes. Therefore, a LRA was calculated taking into account the significant indicators identified in the group comparisons as independent variables (categorical factors were recoded into dummy variables). The following variables were considered in the LRA: housing conditions (private or senior citizens' complex *v.* nursing home); ADL score (partially or completely dependent upon help *v.* primarily or completely self-reliant); subjective assessment of physical health (very good to satisfactory *v.* acceptable to poor); assessment of depressivity in the CES-D scale; and major depression as independent variables; and membership in Group 1 or Group 2 as dependent variables. As displayed in Table 2, for death wishes only the variables: major depression, age and depressivity reached significance. However, using the distinction between severely suicidal persons ($N=8$) *v.* persons without suicidality as the dependent variable in the LRA, the findings with respect to depression were confirmed while age was no longer significantly related with suicidality.

Reflecting the fact that the high correlation between death wishes and major depression makes it difficult to interpret results if both are inserted into a regression, we calculated an additional LRA by using major depression as the dependent variable and keeping the significant indicators identified in the group comparisons as independent variables. For major depression, Table 2 reveals that the factor self-perception of physical health was significantly associated with

Table 2. *Results of logistic regression analysis (LRA) using death wishes and major depression as dependent variables*

Variables in the equation	B	S.E.	Wald	P (df = 1)	Exp(B)
Death wishes					
Age	0·074	0·028	7·02	**	1·07
	(0·068)	(0·065)	(1·09)	(NS)	(1·07)
Gender	0·147	0·432	0·12	NS	1·16
	(−0·194)	(0·991)	(0·04)	(NS)	(0·82)
Residence†	0·812	0·544	2·22	NS	2·25
	(−0·366)	(1·25)	(0·09)	(NS)	(0·69)
Physical health†	−0·046	0·450	0·01	NS	0·96
	(−1·43)	(1·20)	(1·42)	(NS)	(0·24)
ADL score†	0·910	0·772	1·39	NS	2·49
	(0·320)	(1·24)	(0·66)	(NS)	(1·38)
Depressivity	0·092	0·020	21·98	***	1·11
(CES-D score)	(0·099)	(0·038)	(6·81)	(**)	(1·10)
Major depression†	3·700	0·669	30·58	***	40·43
	(2·260)	(1·14)	(3·90)	(*)	(9·58)
Constant	−12·897	3·144	16·82	***	0·00
	(−10·50)	(6·56)	(2·56)	(NS)	(0·00)
Major depression ($N=23$)					
Age	0·02	0·03	0·51	NS	1·02
Gender	0·03	0·45	0·47	NS	1·36
Residence†	−0·43	0·69	0·38	NS	0·65
Physical health†	−1·19	0·45	7·10	**	0·31
ADL score†	−0·74	0·63	1·37	NS	0·48
Constant	−1·85	2·85	0·42	NS	0·16

Values in parentheses for groups: 0, for persons without death wishes ($N=462$) *v.* 1, persons witih suicidal thoughts/attempts ($N=8$).
† Dichotomous variable.
* $P<0{\cdot}05$; ** $P<0{\cdot}01$; *** $P<0{\cdot}001$.

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major depression while all other indicators did not reach significance. Finally, taking into account that dichotomization of independent factors (e.g. ADL scores, self-rated mental and physical health) may have hidden certain relevant relationships by collapsing levels in the dichotomy, we calculated several additional LRAs by using different dichotomization rules. For example, we changed the dichotomization of the ADL score by dividing this score into the categories: 0 = completely dependent upon help to primarily self-reliant *v.* 1 = completely self-reliant, reflecting the marked differences between Group 1 and Group 2 in the ADL levels of primarily and completely self-reliant persons (see Table 1). Changing dichotomization of independent factors did not, however, influence significant results as reported in Table 2 (not shown).

DISCUSSION

Our data indicate that death wishes and suicidal ideation are not excessive in the elderly. Approximately 10% of the subjects in our sample expressed the wish to die, a value that is comparable to figures obtained for persons of younger ages (Barnow & Linden, 1997*a*, *b*; Ahrens *et al*. 2000). The data, furthermore, show that death wishes in old age are related to psychiatric morbidity (particularly as expressed in a diagnosis of major depression or higher values in the CES-D scale), a negative subjective assessment of physical health, living in a nursing home and a higher degree of dependence on help. Age and female gender were also related to death wishes. In contrast, no differences were determined with respect to loneliness, income, education, social network and incidence of physical diseases. Regarding the significant group differences, it is important to remember, however, that our results indicated that age and gender are related to the occurrence of death wishes. Thus, we can not exclude the possibility that group differences were influenced by the higher age of the suicidal group compared with the control group. Therefore, a logistic regression analysis (LRA) was calculated, which allowed us to control for confounding factors. In this analysis, only the presence of major depression, higher depressive mood and age were identified as factors that influenced death wishes among the elderly. Moreover, the LRA revealed that in the absence of the risk factors cited above, in particular having a major depression, the probability that persons will have death wishes, even in this age group, is low.

To answer the question of whether depression and death wishes are both influenced by the same factors, an additional LRA using depression as dependent variable was calculated. This analysis revealed subjective assessment of physical health to be significantly related to depression. Thus, it may be that negatively perceived somatic status has an influence on the onset of depression in this age group, which in turn increases the risk of death wishes and suicidal thoughts. However, it must be kept in mind that our study design does not allow us to make any statement about whether negative self-perception of physical health is the consequence rather than the cause of major depression in the elderly. Further studies using longitudinal data are necessary to understand better how death wishes develop and which role somatic and mental status play in this process.

Taken together, our results show that, in the elderly, the wish to be dead is a symptom of a psychiatric disorder rather than a reaction to the person's living conditions (e.g. housing situation, autonomy) and physical health. We, therefore, conclude that in the majority of cases of elderly persons the wish to die is a sign of a mental disorder and, thus, should indicate the need for professional diagnosis and treatment (Zweig & Hinrichsen, 1993; Waern *et al*. 2002).

There are some limitations in our study. First, suicidal ideation is part of the criteria used to determine a diagnosis of major depression, and is thus a confounding factor. However, the diagnoses were carefully ascertained, using all information of the GMS-A interview, thus it is not likely that the expression of death wishes greatly influenced diagnostic assessment. Moreover, persons with major depression had very high scores on the CES-D scale, which does not include questions with regard to suicidality, compared to study participants without major depression (13·32 (S.D. = 8·9) *v.* 29·13 (S.D. = 7·6), $P < 0{\cdot}001$). This suggests that the psychiatrists' diagnoses were not primarily based on occurrence of death wishes. Secondly, the comparison group was recruited from the remaining sample of non-suicidal elderly persons, thus, it is not

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clear what selection biases might have been produced by this procedure. Thirdly, regarding the sensitivity of the LRA, only 47% of suicidal persons were correctly assigned to Group 2 (with death wishes), suggesting additional influences on suicidality in the elderly. However, the strengths of our study include: a population-based sample; the use of standardized instruments; a multilevel assessment; and, a sufficiently large group of persons with very high age.

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