



The association between depression and mortality – a comparison of survey- and register-based measures of depression



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ABSTRACT

Background: A number of studies have associated depression with a high mortality risk. However, in surveys, depression is often measured by self-reports in selected sub-samples, while register studies have been based on hospital diagnosis or purchase of antidepressants. We examined how different survey- and register-based measures of depression were associated with 7-year mortality in a cohort of middle-aged Danish men.

Methods: The study was based on 10,517 men born in 1953. Depression was assessed through hospital diagnosis for the period from 1969 to 2004 and by self-reported information on depression, use of antidepressants and the Major Depression Inventory (MDI) from a survey in 2004, in which 58.8% (n=6292) of the men participated. Information on mortality and cause of death was retrieved from registers for the period between 2004 and 2011.

Results: Depression diagnosis from hospital registers as well as self-reported depression, use of antidepressants and having a high MDI-score were significantly associated with mortality from all, natural and unnatural causes. The associations were of a similar magnitude for the register-based measure of depression and for the survey-based measures reflecting past depression, but the strongest association was found for current depression as assessed by the MDI-score.

Limitations: The study population consists almost exclusively of white men and the findings may not be generalizable to female populations or other races and ethnicities.

Conclusions: Physicians should be aware of male patients with a history of depression from hospital records or self-reported as they have higher mortality risk years after their first symptom.

1. Introduction

The relationship between major depression and excess mortality is well-established. Both older and more recent reviews have provided relative risks (RR) for mortality of 1.50 among people with depression (Harris and Barraclough, 1998; Cuijpers et al., 2014a) with the highest risk in men (RR=2.04; 95%CI 1.76–2.37) (Cuijpers et al., 2014b). Most studies have dealt with the issue of mortality and depression diagnosed in clinical settings, while fewer have studied whether depressive symptoms influence mortality in population based samples (Cuijpers et al., 2013). Depression rating scales are the preferred method to measure depression in surveys, but it is also possible to ask directly whether a person has had a depression in the past or is currently diagnosed with depression. However, surveys are most often subject to

selective non-participation and may be costly for large samples. Consequently, a number of more recent studies have used population-based register information, such as hospitalizations with diagnosis of depression or redemption of antidepressants as indicators of depression. Although these indicators address the above limitations they may not capture cases that remain untreated (Thielen et al., 2009). No study seems to have examined how well different self-reported and register-based measures of depression associate with mortality in the same population. The aim of the present study was to examine how a register-based depression diagnosis, self-reported depression, and a depression rating scale associate with all-cause mortality as well as mortality from natural and unnatural causes of death in a sample of middle-aged men.

Abbreviations:MDI, Major Depression Inventory

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Table 1

The distribution of register- and survey-based measures of depression in 2004 in relation to subsequent 7-year mortality (natural and unnatural causes) and covariables for 10,517 Danish men born 1953.

Measure of depression	Number		Covariables						
	Total	Deaths (n/un)	% DM	% Other longstanding illness	% BMI \geq 30	% Low social class	% Smokers	% \geq 35 Drinks/week	% Low leisure time activity
Register-based measure of depression									
Hospital diagnosis of depression									
<i>Total cohort</i>	10,517	611(410/30)	–	–	–	–	–	–	–
No	10,263	574(389/25)	–	–	–	–	–	–	–
Yes	254	37 (26/4)	–	–	–	–	–	–	–
<i>Non-responders in 2004 survey</i>									
	4225	356(244/18)	–	–	–	–	–	–	–
No	4097	337(230/14)	–	–	–	–	–	–	–
Yes	128	19(16/2)	–	–	–	–	–	–	–
<i>Participants in 2004 survey</i>									
	6292	255(170/12)	4.8	30.0	12.7	18.3	42.4	15.0	17.7
No	6166	237(159/11)	2.8	29.7	12.3	18.0	42.2	14.9	17.7
Yes	126	18(19/2)	4.7	49.6	15.7	29.8	57.1	19.1	19.8
Survey-based measures of depression									
Self-reported depression									
No	5531	187(128/6)	4.4	27.5	12.4	16.8	40.6	13.7	16.8
Yes	730	63(39/6)	7.5	49.4	14.7	28.9	56.8	24.4	23.9
Self-reported age of depression onset									
No depression	5528	187(128/2)	4.4	27.5	12.4	16.8	40.6	13.7	16.8
Before age 40	278	25 (16/2)	8.6	54.3	13.7	28.8	59.0	25.2	25.1
Age 40 or later	383	28 (17/4)	7.1	47.9	17.1	29.4	55.6	23.0	23.4
Self-reported antidepressant treatment									
No, never	5590	179(122/6)	4.4	27.7	12.4	16.8	40.6	13.7	17.0
Yes, \geq 3 years ago	268	23 (17/1)	6.7	45.0	11.8	28.0	55.0	18.7	21.9
Yes, < 3 years ago	150	11(7/0)	6.0	46.5	14.5	35.4	56.7	28.7	20.1
Yes, on-going	233	33(18/4)	7.6	57.1	16.7	29.6	60.8	28.7	26.6
MDI-score									
0–24	6022	204(139/33)	4.5	28.9	12.6	17.3	41.5	14.1	16.6
25+	217	42(10/2)	12.9	63.2	13.0	41.8	67.9	36.4	45.2

Abbreviations: n=natural causes of death; un=unnatural causes of death; DM=Diabetes Mellitus; BMI=Body Mass Index; MDI=Major Depression Inventory.

2. Methods

2.1. Study population

The Metropolit cohort is defined as the 11,532 men, born in 1953 in the Copenhagen Metropolitan area, who were living in Denmark in 1968 (Osler et al., 2006). The study population of the present study consists of the 10,517 men from the Metropolit cohort, who were still alive in September 2004, at which time they were invited to participate in a postal questionnaire survey.

2.2. Measures of depression

Register-based measure of depression: All 10,517 men were followed through register linkages to the Danish Psychiatric Central Registry from 1969 until September 2004 for time of admission to psychiatric wards and diagnosis on discharge. Diagnoses from the hospital register were classified according to the 8th Revision of the International Classification of Diseases (ICD8) for the years from 1969 to 1993, and the 10th revision (ICD10) from 1994. The diagnoses included for depression in the present study were ICD-8: 296.0, 296.2, 296.3, 298.0, 300.4 and ICD-10: F31.3, F31.4, F31.5, F31.6, F38, F32, F33, F34.1. We also recorded year of first hospital admission.

Survey-based measures of depression: in September 2004, 6292 (59.8%) of the 10,517 cohort members responded to a mailed health questionnaire. The survey included measures of *Self-reported depression* based on positive answers to the question: “Has a doctor ever told you that you suffer from depression?”. Subjects with a positive response were also asked “how old were you when the disease occurred for the first time?” and “Do you or have you ever taken medicine for depression” with the following four categories: 1. Yes, I take this medicine at present, 2. Yes, during the last 3 years, 3. Yes, more than 3 years ago and 4. No, never. The survey also included the *Major Depression Inventory (MDI)*, which was used to measure frequency of depressive symptoms (Olsen et al., 2003). The MDI is a frequently used and well-validated self-report screening tool of depressive symptoms, which consists of 12 items assessing the frequency of depressive symptoms during the past two weeks. Each item was rated on a six point scale ranging from zero (not at all) to five (all the time). Ratings were summed to calculate a total score which can range from 0 to 50. Based on a previous study of diagnostic validity a cut-off of 25 points or more was defined as major depression (Bech et al., 2001).

2.3. Ascertainment of mortality

All cohort members were followed for all-cause mortality in the

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