

- 17 Buwa D, Vuori H. Rebuilding a health care system: war, reconstruction and health care reforms in Kosovo. *Eur J Public Health* 2007;17:226–30.
- 18 Eytan A, Toscani L, Loutan L, Bovier PA. Posttraumatic stress disorder and the use of general health services in postwar Kosovo. *J Trauma Stress* 2006;19:57–67.
- 19 Eytan A, Guthmiller A, Durieux-Paillard S, et al. Mental and physical health of Kosovar Albanians in their place of origin: a post-war 6-year follow-up study. *Soc Psychiatry Psychiatr Epidemiol* 2010. (15 July 2010, Epub ahead of print).
- 20 Eytan A, Gex-Fabry M, Toscani L, et al. Determinants of postconflict symptoms in Albanian Kosovars. *J Nerv Ment Dis* 2004;192:664–71.
- 21 Sheehan DV, Lecrubier Y, Sheehan KH, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry* 1998;59(Suppl. 20):22–33. quiz 34–57.
- 22 Morina N, Ford JD. Complex sequelae of psychological trauma among Kosovar civilian war victims. *Int J Soc Psychiatry* 2008;54:425–36.
- 23 Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care* 1992;30:473–83.
- 24 Leplège A. *Le questionnaire MOS SF-36, manuel de l'utilisateur et guide d'interprétation des scores*. Paris: ESTEM éditions, 2001.
- 25 Reinert DF, Allen JP. The alcohol use disorders identification test: an update of research findings. *Alcohol Clin Exp Res* 2007;31:185–99.
- 26 Kashdan TB, Morina N, Priebe S. Post-traumatic stress disorder, social anxiety disorder, and depression in survivors of the Kosovo War: experiential avoidance as a contributor to distress and quality of life. *J Anxiety Disord* 2009;23:185–96.
- 27 Spitzer C, Barnow S, Volzke H, et al. Trauma, posttraumatic stress disorder, and physical illness: findings from the general population. *Psychosom Med* 2009;71:1012–7.
- 28 Lopes Cardozo B, Vergara A, Agani F, Gotway CA. Mental health, social functioning, and attitudes of Kosovar Albanians following the war in Kosovo. *JAMA* 2000;284:569–77.
- 29 Cloitre M. Effective psychotherapies for posttraumatic stress disorder: a review and critique. *CNS Spectr* 2009;14(Suppl. 1):32–43.
- 30 Eytan A, Shehu-Brovina S. [From Kosovo to Switzerland: mental health perceptions and practical implications for health professionals]. *Rev Med Suisse* 2005;1:2167–8, 2170, 2172.
- 31 De Vries AK, Klazinga NS. Mental health reform in post-conflict areas: a policy analysis based on experiences in Bosnia Herzegovina and Kosovo. *Eur J Public Health* 2006;16:247–52.
- 32 Avdibegovic E, Delic A, Hadzibeganovic K, Selimbasic Z. Somatic diseases in patients with posttraumatic stress disorder. *Med Arh* 2010;64:154–7.
- 33 Dirkzwager AJ, van der Velden PG, Grievink L, Yzermans CJ. Disaster-related posttraumatic stress disorder and physical health. *Psychosom Med* 2007;69:435–40.
- 34 Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav* 1995;36:1–10.
- 35 Wang SJ, Pacolli S, Rushiti F, et al. Survivors of war in the Northern Kosovo (II): baseline clinical and functional assessment and lasting effects on the health of a vulnerable population. *Confl Health* 2010;4:16.
- 36 Alonso J, Angermeyer MC, Bernert S, et al. Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatr Scand Suppl* 2004;109(Suppl. s420):21–7.
- 37 Goel RK, Budak J. Smoking patterns in Croatia and comparisons with European nations. *Cent Eur J Public Health* 2007;15:110–5.
- 38 Weaver TL, Cajdric A, Jackson ER. Smoking patterns within a primary care sample of resettled Bosnian refugees. *J Immigr Minor Health* 2008;10:407–14.
- 39 Samardzic S, Marvinac GV, Prlc A. Regional pattern of smoking in Croatia. *Coll Antropol* 2009;33(Suppl. 1):43–6.
- 40 Ramadani N, Berisha M, Thaci A, et al. Tobacco use among Kosovar schoolchildren: a cross-sectional study. *Med Arh* 2009;63:44–7.

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## Usefulness of a single-item measure of depression to predict mortality: the GAZEL prospective cohort study

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**Background:** It remains unknown whether short measures of depression perform as well as long measures in predicting adverse outcomes such as mortality. The present study aims to examine the predictive value of a single-item measure of depression for mortality. **Methods:** A total of 14 185 participants of the GAZEL cohort completed the 20-item Center-for-Epidemiologic-Studies-Depression (CES-D) scale in 1996. One of these items (I felt depressed) was used as a single-item measure of depression. All-cause mortality data were available until 30 September 2009, a mean follow-up period of 12.7 years with a total of 650 deaths. **Results:** In Cox regression model adjusted for baseline socio-demographic characteristics, a one-unit increase in the single-item score (range 0–3) was associated with a 25% higher risk of all-cause mortality (95% CI: 13–37%,  $P < 0.001$ ). Further adjustment for health-related behaviours and physical chronic diseases reduced this risk by 36% and 8%, respectively. After adjustment for all these variables, every one-unit increase in the single-item score predicted a 15% increased risk of death (95% CI: 5–27%,  $P < 0.01$ ). There is also an evidence of a dose–response relationship between response scores on the single-item measure of depression and mortality. **Conclusion:** This study shows that a single-item measure of depression is associated with an increased risk of death. Given its simplicity and ease of administration, a very simple single-item measure of depression might be useful for identifying middle-aged adults at risk for elevated depressive symptoms in large epidemiological studies and clinical settings.

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## Introduction

Depressive disorders are a huge public health issue worldwide with considerable social and economic burden.<sup>1</sup> According to the World Health Organization, by 2020 depression is expected to cause more disability than infectious diseases, cancer or accidents and to be the second cause of morbidity in the world.<sup>2</sup> Apart from its frequent occurrence, depression is often co-morbid with other disabling chronic disease including diabetes,<sup>3</sup> cardiovascular disease (CVD),<sup>4,5</sup> and has been linked to higher mortality risk in healthy individuals and patients with chronic conditions.<sup>6–9</sup>

For these reasons, several clinical guidelines recommend screening and treatment of depression in both primary- and cardiovascular-care settings.<sup>7,10–13</sup> To achieve this goal, brief and simple screening and case-finding tools have been recommended with some guidelines even suggesting the use of one or two simple questions on mood and anhedonia ('Over the past 2 weeks, have you felt down, depressed, or hopeless?' and 'Over the past 2 weeks, have you felt little interest or pleasure in doing things?') as the first step for identifying currently depressed patients.<sup>7,12,13</sup> Studies on the relevance of short measures suggest that certain short tools can provide effective screening for a majority of depressed patients and, in some cases, may perform better than the longer tools.<sup>14–18</sup>

However, it remains unknown whether short measures of depression, single-item measure for instance, perform as well as long measures in predicting adverse clinical outcomes such as mortality. The present study was conducted to examine the predictive value, with mortality as the outcome, of the single item 'I felt depressed' derived from the CES-D scale in a large cohort of French employees.

## Methods

### Participants

The GAZEL cohort study was established in 1989, details of this study are available elsewhere.<sup>19</sup> The target population consisted of employees of the French national gas and electricity company (EDF–GDF). At baseline, 20 624 (15 010 men and 5614 women), aged 35–50 years, gave consent to participate in this study. The study design consists of an annual questionnaire used to collect data on health, lifestyle, individual, familial, social and occupational factors and life events.<sup>19</sup> Various sources within EDF–GDF provide additional data on GAZEL participants. For example, the company has an occupational medicine department, its own medical insurance system and a detailed surveillance system that permits extensive follow-up and linkage of health records with exposure characteristics.<sup>20</sup> All the measures used in the present analysis, apart from mortality, are drawn from the questionnaire sent to all living members of the study in 1996, i.e. the baseline of the present study. The GAZEL study received approval from the national commission overseeing ethical data collection in France (Commission Nationale de L'Informatique et Libertés).

### Measures

#### Single-item measure of depression

Depressive symptoms in the present were measured using the validated French version of the CES-D scale.<sup>21</sup> The CES-D scale is a 20-item self-report questionnaire designed to measure depressive symptomatology in community studies.<sup>22</sup> It measures depressive feelings and behaviours during the past week. Responses to all items range from 0 (rarely), 1 (sometimes), 2 (occasionally) or 3 (most of the time). The CES-D scores were generally dichotomized (yes/no) as follows: a score  $\geq 16$  from a total possible score of 60 was considered to be indicative of clinically significant depression.<sup>22</sup> The specific item of the CES-D scale 'I felt depressed' (item 6) was considered as the single-item measure of depression and response scores ranged from 0 to 3.

## Mortality

Vital status on all participants is obtained annually from EDF–GDF itself as it pays out retirement benefits. All-cause mortality data were available until 30 September 2009, a mean follow-up period of 12.7 years.

## Covariates

Age and sex were obtained from employer's human resources files. Data on occupational position were also drawn from the EDF–GDF records and categorized into low (unskilled workers), intermediate (skilled workers) and high (managers) occupational position. Health-related behaviours were drawn from the 1996 self-report questionnaire. Smoking status was categorized as never-, ex- and current-smoker. Alcohol consumption (in the week preceding the questionnaire completion) was categorized as none, moderate (1–21 drinks per week for men and 1–14 drinks per week for women) and high consumption ( $>21$  drinks per week for men and  $>14$  per week for women). Physical activity was determined by asking the participants if they practiced a physical exercise and categorized as: (i) at a competitive level; (ii) regular but not at a competitive level; (iii) occasionally, or on holiday; and (iv) none. Body Mass Index (BMI) was calculated by dividing weight in kilograms by height in meters squared and categorized as:  $<20$ , 20–24.9, 25–29.9 or  $\geq 30$  kg/m<sup>2</sup>. Prevalent chronic health problems were based on a list of diseases and symptoms experienced in the past 12 months consisting of hypertension, CVD, diabetes and dyslipidemia.

## Statistical analysis

Differences in response scores on the single-item measure of depression and survival status as a function of sample characteristics at baseline were assessed using a one-way ANOVA and the chi-square tests, respectively. The associations between the single-item measure of depression and mortality risk over the follow-up period were modelled using the item as a continuous variable in four serially adjusted Cox regressions models. In Model 1, single-item of depression score, age, sex and occupational position were the sole predictors. In Model 2, hazard ratios (HRs) were additionally adjusted for health-related behaviours. Models 3 was Model 1 additionally adjusted for self-reported chronic diseases. In Model 4, HRs were adjusted for all aforementioned variables. Interaction between depression measure and sex in relation to mortality risk was not significant ( $P > 0.05$ ), allowing us to combine men and women in the analyses. The time-dependent interaction terms between each predictor and the logarithm of follow-up period (time variable) were all non-significant ( $P > 0.05$ ) confirming that the proportional hazards assumption was justified.

## Results

A total of 13 757 participants of the GAZEL cohort responded to the entire CES-D scale and 14 185 participants responded to the single-item 'I felt depressed' (69% of the total study population in 1989). During a mean follow-up of 12.7 years, 650 participants (4.6%) died, consisting of 549 men (5.3%) and 101 women (2.7%).

Table 1 presents the sample characteristic at baseline (1996) as a function of depression measured by the single-item and survival status. Table 2 displays the associations between single-item measure of depression and all-cause mortality. In model adjusted for socio-demographic characteristics, a one-unit increase in the single-item scores was associated with a 25% greater risk of all-cause mortality (95% CI: 9–49,  $P = 0.003$ ). Further adjustment for health-related behaviours and physical chronic diseases reduced this risk by 36% and 8%, respectively. After adjustment for all these variables, the risk of death remained 15% higher for one-unit increase in the single-item score (95% CI: 5–27,  $P < 0.01$ ).

### Sensitivity analysis

In our analysis, the single-item score was entered in models as continuous variable. In order to assess whether this analytic strategy influenced the

**Table 1** Sample characteristics at baseline as a function of the item 'I felt depressed' score and survival status

Variables	Total, n (%)	'I felt depressed' score		Survival status	
		Mean (SD)	P-value or for trend	Dead	P-value or for trend
Age, mean (SD)	51.2 (3.5)	-0.13 <sup>a</sup>	<0.001	52.4 (3.3)	<0.001
Sex			<0.001		<0.001
Male	10435 (74)	1.45 (0.70)		549 (5.3)	
Female	3750 (26)	1.92 (0.90)		101 (2.7)	
Employment position			<0.001		0.052
Low	2080 (14.5)	1.74 (0.88)		121 (5.8)	
Intermediate	8239 (58.2)	1.60 (0.79)		366 (4.4)	
High	3847 (27.2)	1.44 (0.68)		161 (4.2)	
Missing	19 (0.1)	2.15 (1.16)		2 (10.5)	
Smoking			0.698		<0.001
Never	6070 (42.8)	1.60 (0.80)		189 (3.1)	
Ex	5274 (37.2)	1.52 (0.74)		241 (4.6)	
Current	2592 (18.3)	1.65 (0.84)		208 (8.0)	
Missing	249 (1.8)	1.59 (0.78)		12 (4.8)	
Alcohol intake			0.797		0.084
None	1733 (12.2)	1.76 (0.89)		101 (5.8)	
Moderate	9305 (65.6)	1.55 (0.77)		356 (3.8)	
High	2764 (19.5)	1.53 (0.74)		171 (6.2)	
Missing	383 (2.7)	1.74 (0.86)		22 (5.7)	
Physical activity			<0.001		<0.001
Competition	679 (4.8)	1.37 (0.62)		18 (2.7)	
>1/week	4134 (29.1)	1.51 (0.72)		147 (3.6)	
Only on holidays	3787 (26.7)	1.54 (0.75)		154 (4.1)	
Never	5477 (38.6)	1.69 (0.85)		321 (5.9)	
Missing	108 (0.8)	1.67 (0.91)		10 (9.3)	
BMI (kg/m <sup>2</sup> )			0.130		<0.001
< 20	223 (1.6)	133 (59.6)		14 (6.4)	
20–24.9	6526 (46.0)	2834 (43.4)		280 (4.3)	
25–29.9	5998 (42.3)	2373 (39.6)		277 (4.6)	
≥ 30	1207 (8.5)	546 (45.2)		450 (4.1)	
Missing	231 (1.6)	102 (44.2)		29 (12.5)	
Hypertension			<0.001		0.001
No	12417 (87.5)	1.57 (0.78)		542 (4.4)	
Yes	1768 (12.5)	1.67 (0.83)		108 (6.1)	
CVD			0.005		<0.001
No	13949 (98.3)	1.58 (0.78)		623 (4.5)	
Yes	236 (1.7)	1.72 (0.85)		27 (11.4)	
Diabetes			0.486		0.002
No	13877 (97.8)	1.58 (0.78)		624 (4.5)	
Yes	308 (2.2)	1.62 (0.84)		26 (8.4)	
Dyslipidemia			0.032		0.910
No	11794 (83.1)	1.57 (0.78)		542 (4.6)	
Yes	2391 (16.9)	1.61 (0.80)		108 (4.5)	

a: Coefficient of correlation between age and the single-item scores

**Table 2** HRs with 95% CIs for the association between the single item 'I felt depressed' score and mortality

Depression measure	Risk of mortality		
	Events/ participants (n)	HR (95%CI)	Percentage of reduction
Model 1			
Single-item score	650/14185	1.25 (1.13–1.37)***	–
Model 2			
Single-item score	650/14185	1.16 (1.06–1.28)**	36
Model 3			
Single-item score	650/14185	1.23 (1.12–1.35)***	8
Model 4			
Single-item score	650/14185	1.15 (1.05–1.27)**	40

Model 1: HR adjusted for sex, age, occupational position

Model 2: Model 1 additionally adjusted for alcohol, smoking, physical activity, BMI

Model 3: Model 1 additionally adjusted for hypertension, CVD, diabetes, dyslipidemia

Model 4: Model 1 additionally adjusted for all aforementioned covariates

\* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$

results, we undertook further analysis using the single-item measure as a four-category variable (rarely, sometimes, occasionally, most of the time). In the model adjusted for socio-demographic characteristics those who responded 'sometimes' (HR = 1.11,  $P > 0.05$ ) 'occasionally' (HR = 1.53,  $P = 0.001$ ) and 'most of the time' (HR = 2.53  $P < 0.001$ ) had greater risk of death relatively to those who responded 'rarely'. Adjustment for all covariates reduced but did not remove away the associations for the latter categories; the corresponding fully HRs being 1.06 ( $P > 0.05$ ), 1.31 ( $P = 0.036$ ), 1.94 ( $P = 0.001$ ).

## Discussion

In this prospective cohort study, we sought to examine the predictive ability of depression assessed using a single item for all-cause mortality followed over 12 years. In analysis adjusted only for baseline socio-demographic characteristics, a one-unit increase in the single-item score (range 0–3) was associated with a 25% higher risk of all-cause mortality. After further adjustment for health-related behaviours, and self-reported physical chronic diseases, every one-unit increase in the single-item score predicted a 15% increased risk of death. We also noted a graded relationship, with participants who reported to feel depressed 'occasionally' and 'most of the time' being particularly at greater risk of death.

We found one previous study<sup>23</sup> to have examined the association between the single-item measure of depression, also derived from the CES-D scale, and all-cause mortality. The study was conducted among community-dwelling elderly subjects and the authors concluded that the single-item measure predicted 5-year mortality. However, data on health-related behaviours and chronic conditions, likely to be important confounders of this association in the elderly, were not available in this study.

A strength of the present study is its large sample size; roughly 10 times the size of the previous study on this topic.<sup>23</sup> We were also able to control for a wide range of potential confounders that are related to both depressive symptoms and mortality, including health-related behaviours, prevalent chronic physical conditions and self-rated health. Finally, our findings are based on mortality followed over a long period and are likely not to be confounded by illness at baseline.

Our results showing a single-item self-report of depression to predict mortality over an extended period of follow-up lend some support to the potential utility of short measures to identify depressive subjects. Thus, the single-item measure of depression can reasonably replace multiple-item measures in large scale studies that require frequent assessments, or studies of elderly in which the time requested to fulfil a questionnaire needs to be short. In clinical settings, the use of the single-item measure of depression could theoretically provide a simple method to identify patients who might benefit from specific interventions such as intense disease management.<sup>7,10–13</sup>

We found a graded and strong relationship between response scores on the single-item measure of depression and mortality. Thus, the single-item measure of depression as a four-categories rather than a dichotomized variable<sup>23</sup> seems able to separate individuals as a function of the severity of their depression symptoms and should be preferred.

There are some caveats to the present findings. Despite the fact that the data in this study are from employees in a company operating throughout France and comprising a wide range of occupations, it should be noted that the GAZEL cohort is not representative of the general population as it does not include unemployed individuals. This may limit the generalisability of the results. Indeed, the proportion of participants with more severe psychiatric disorders and somatic diseases is likely to be lower than that in the general population. This may have led to some underestimation of the effect size observed in this study. Although, it has been suggested that significant depressive symptomatology is a risk factor for clinical depression,<sup>22,24</sup> the single-item measure of depression might merely measure general psychological distress rather than clinical depression.

In conclusion, in this large observational cohort study, we found depression measured by a single item to be associated with an increased risk of death, mainly explained by health-related behaviours. Given its simplicity and ease of administration, this single-item measure of depression might be useful for identifying middle-aged adults at risk for elevated depressive symptoms in large epidemiological studies and clinical settings.

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*Conflicts of interest:* None declared.

## Key points

- It remains unknown whether short measures of depression perform as well as long measures in predicting adverse clinical outcomes such as mortality.
- This large observational cohort study shows that depression measured by a single item is associated with an increased risk of death, mainly explained by health-related behaviours.
- A very simple single-item measure of depression might be useful for identifying middle-aged adults at risk for elevated depressive symptoms in large epidemiological studies and clinical settings.

## References

- 1 Moussavi S, Chatterji S, Verdes E, et al. Depression, chronic diseases, and decrements in health: results from the world health surveys. *Lancet* 2007;370:851–8.
- 2 Murray CJ, Lopez AD. Alternative projections of mortality and disability by cause 1990–2020: global burden of disease study. *Lancet* 1997;349:1498–504.
- 3 Golden SH, Lazo M, Carnethon M, et al. Examining a bidirectional association between depressive symptoms and diabetes. *JAMA* 2008;299:2751–9.
- 4 Ferketich AK, Schwartzbaum JA, Frid DJ, Moeschberger ML. Depression as an antecedent to heart disease among women and men in the NHANES I study. National health and nutrition examination survey. *Arch Intern Med* 2000;160:1261–8.
- 5 Frasure-Smith N, Lesperance F. Depression—a cardiac risk factor in search of a treatment. *JAMA* 2003;289:3171–3.
- 6 Katon WJ, Rutter C, Simon G, et al. The association of comorbid depression with mortality in patients with type 2 diabetes. *Diabetes Care* 2005;28:2668–72.
- 7 Lichtman JH, Bigger JT Jr, Blumenthal JA, et al. Depression and coronary heart disease: recommendations for screening, referral, and treatment: a science advisory from the American heart association prevention committee of the council on cardiovascular nursing, council on clinical cardiology, council on epidemiology and prevention, and interdisciplinary council on quality of care and outcomes research: endorsed by the American psychiatric association. *Circulation* 2008;118:1768–75.
- 8 Schulz R, Drayer RA, Rollman BL. Depression as a risk factor for non-suicide mortality in the elderly. *Biol Psychiatry* 2002;52:205–25.
- 9 Nabi H, Kivimaki M, Suominen S, et al. Does depression predict coronary heart disease and cerebrovascular disease equally well? The health and social support prospective cohort study. *Int J Epidemiol* 2010;39:1016–24.
- 10 Ellis P. Australian and New Zealand clinical practice guidelines for the treatment of depression. *Aust N Z J Psychiatry* 2004;38:389–407.
- 11 MacMillan HL, Patterson CJ, Wathen CN, et al. Screening for depression in primary care: recommendation statement from the Canadian task force on preventive health care. *CMAJ* 2005;172:33–5.
- 12 Lachs MS, Feinstein AR, Cooney LM Jr, et al. A simple procedure for general screening for functional disability in elderly patients. *Ann Intern Med* 1990;112:699–706.
- 13 Pignone MP, Gaynes BN, Rushton JL, et al. Screening for depression in adults: a summary of the evidence for the U.S. preventive services task force. *Ann Intern Med* 2002;136:765–76.
- 14 Arroll B, Goodyear-Smith F, Kerse N, et al. Effect of the addition of a “help” question to two screening questions on specificity for diagnosis of depression in general practice: diagnostic validity study. *BMJ* 2005;331:884.
- 15 Carroll D, Davey Smith G, Sheffield D, et al. The relationship between socioeconomic status, hostility, and blood pressure reactions to mental stress in men: data from the Whitehall II study. *Health Psychol* 1997;16:131–6.
- 16 Mitchell AJ, Coyne JC. Do ultra-short screening instruments accurately detect depression in primary care? A pooled analysis and meta-analysis of 22 studies. *Br J Gen Pract* 2007;57:144–51.
- 17 Whooley MA, Avins AL, Miranda J, Browner WS. Case-finding instruments for depression. Two questions are as good as many. *J Gen Intern Med* 1997;12:439–45.
- 18 Lowe B, Kroenke K, Grafe K. Detecting and monitoring depression with a two-item questionnaire (PHQ-2). *J Psychosom Res* 2005;58:163–71.
- 19 Goldberg M, Leclerc A, Bonenfant S, et al. Cohort profile: the GAZEL Cohort Study. *Int J Epidemiol* 2007;36:32–9.
- 20 Goldberg M, Chastang JF, Zins M, et al. Health problems were the strongest predictors of attrition during follow-up of the GAZEL cohort. *J Clin Epidemiol* 2006;59:1213–21.



- 21 Rouillon F, Fuhrer R. La version française de l'échelle CES-D (Center for epidemiologic studies depression scale). Description et traduction de l'échelle d'auto-évaluation. *Psychiatr Psychobiol* 1989;4:163–6.
- 22 Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *Appl Psychol Meas* 1977;1:385.
- 23 St John PD, Montgomery P. Does a single-item measure of depression predict mortality? *Can Fam Physician* 2009;55:e1–5.
- 24 Horwath E, Johnson J, Klerman GL, Weissman MM. Depressive symptoms as relative and attributable risk factors for first-onset major depression. *Arch Gen Psychiatry* 1992;49:817–23.

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## Associations between deprived life circumstances, wellbeing and self-rated health in a socially marginalized population

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**Background:** Previous studies of self-rated health among socially marginalized people provide insufficient understandings of what influences their self-rated health. This study aimed to examine how disadvantaged life circumstances (homelessness, substance abuse, poverty) and general well-being were associated with poor self-rated health among the socially marginalized. **Methods:** In a nationwide survey in Denmark, 1348 users of shelters, drop-in centres, treatment centres and social psychiatric centres answered a self-administered questionnaire. We analysed data using logistic regression. **Results:** Disadvantaged life circumstances and well-being were associated with self-rated health, also when controlling for illness, mental disorder and age. Male respondents exposed to two or more disadvantaged life circumstances had higher odds of poor self-rated health [odds ratio (OR): 2.96; 95% confidence interval (CI): 1.80–4.87] than males exposed to fewer disadvantages. A low sense of personal well-being implied higher odds of poor self-rated health among both men and women. Among men, not showering regularly (OR: 1.81; 95% CI: 1.17–2.79), and among women, not eating varied food (OR: 2.24; 95% CI: 1.20–4.20) and exposure to physical violence (borderline significant) implied higher odds of poor self-rated health. Male and female respondents reporting lack of sleep and loneliness (borderline significant among women) had higher odds of poor self-rated health. **Conclusions:** The poor self-rated health among socially marginalized is strongly associated with massive social problems, poor living conditions and poor well-being. This study elucidates the need for more broadly based and holistic initiatives by both the health sector and the social services, incorporating health promotion initiatives into social work.

### Introduction

This study aims to examine the complex relationship between disadvantaged life circumstances, general well-being and self-rated health in a socially marginalized population. We define our study population in accordance with the target group of the Danish Council for Socially Marginalised People: people who use welfare work services defined as shelters, drop-in centres, treatment centres and social psychiatric centres. These places either provide meals, accommodation, treatment, support or in other ways help socially marginalized people, e.g. homeless people, substance abusers or the mentally ill. In the following, we use 'socially marginalized people' as a joint term to refer to users of such welfare work services.

Socially marginalized people suffer from poor physical and mental health, poor well-being, low health-related quality of life and have few and inadequate social relations.<sup>1–4</sup> The health of the socially marginalized is strikingly poorer than that of the general population.<sup>3,5–8</sup> In a study among meal service users, the odds of fair or poor self-rated health were 4.5 times higher compared to the general population after adjusting for age and sex.<sup>8</sup>

There is strong evidence that good self-rated health decreases with age and with having a long-standing illness.<sup>9</sup> Homeless males generally rate their health more positively than women.<sup>8,10–13</sup> Additional predictors of poor self-rated health among homeless persons are accommodation status, being in a depressed mood, severe symptoms of alcoholism, length of unemployment, low educational level<sup>8,13</sup> and extent of previous, negative life events such as job loss, eviction and physical abuse.<sup>14</sup>

Current research within the field of health and well-being among socially marginalized people has not produced sufficient understanding

of which factors influence self-rated health. One reason is that numerous studies focus only on one subgroup of the socially marginalized, e.g. the homeless, another is that most studies refrain from taking into account the possible accumulation of disadvantaged life circumstances, that is, that the socially marginalized are often exposed to several disadvantages simultaneously. In this study, we aimed to examine how the number of disadvantaged life circumstances that socially marginalized people are exposed to, as well as general well-being, were associated with poor self-rated health among socially marginalized people.

### Methods

#### *Study population and data collection process*

Data on health and well-being of the socially marginalized were obtained from a survey conducted in Denmark in 2007. The study population was defined as people who use welfare work services: shelters, drop-in centres, treatment centres and social psychiatric centres.

Conducting a health survey among socially marginalized people requires innovative data collection procedures as this population includes people without an address or people who for various reasons do not respond to postal questionnaires. In this study, we collected data by asking shelters and centres, where socially marginalized people live or spend part of their time, to hand out and collect self-administered questionnaires among their users. Shelters/centres and respondents were not randomly selected and thus, the respondents were not a representative sample of users of such shelters and centres in Denmark. Questionnaires were in Danish; consequently, the survey included Danish-speaking respondents only.