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Research: Complications

Screening for depression and diabetes-related distress in a diabetes outpatient clinic

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Abstract

Aims To investigate: (1) the willingness of patients with diabetes to participate in a screening programme; (2) the extent to which patients with diabetes who screen positive endorse need for psychosocial care; (3) the rate of referral to psychosocial care during screening vs. usual care.

Methods Four hundred and ninety-nine patients with diabetes were invited to complete the Center for Epidemiologic Studies Depression and the Problem Areas in Diabetes questionnaires. Patients screening positive on either instrument were invited for an interview. One year after screening was withdrawn, rates of referral to psychosocial care were assessed from physician reports of patient referrals.

Results In total, 349/499 (70%) patients with diabetes completed the questionnaire. Patients who did not take up the screening were younger, smoked more often and had higher HbA_{1c} values. 'No-shows' for clinical appointments accounted for 74% of non-participation. Of the 104 (30% of 349) patients screening positive, 45 accepted an invitation for an interview. Finally, 36/104 (35%) would like a referral for psychological care. Seven per cent of patients were referred to psychological care during screening compared with 1% when screening was withdrawn.

Conclusions Results raise questions as to whether screening is the most efficient way to identify patients with psychological problems. Many patients did not take up the screening, especially those with low adherence to diabetes care in general. Furthermore, few patients screening positive wanted to be referred. Screening should be evaluated in the context of consideration of alternative ways to identify at-risk patients, including providing resources to deal with patients with already known adjustment and adherence problems.

Diabet. Med. 30, 88–94 (2013)

Introduction

Psychological problems such as depressive symptoms and diabetes-related distress are common in both patients with Type 1 and Type 2 diabetes [1,2]. These problems compromise diabetes care tasks and negatively impact health status. Yet, patients with psychological problems do not typically self-identify, and they often go unrecognized by care providers [3], leading to under-treatment [4]. Therefore, international diabetes guidelines [5,6] now recommend routinely screening patients with diabetes for depressive symptoms and diabetes-related distress. The rationale is that these problems are common and detectable, and efficient treatments are available,

such as cognitive behavioural therapy and antidepressant medication [7].

Guidelines recommend routine screening for psychological problems in diabetes care on the assumption that implementation (1) increases the detection of patients with diabetes with psychological problems and (2) leads to referral to appropriate and effective mental health care, and ultimately to improvement in patient outcomes [8]. Yet, for screening to function efficiently, as assumed, several conditions must be met.

First, patients with diabetes must be willing to participate in each of the two stages of screening. The first stage involves completion of a short screening questionnaire; the second stage entails a follow-up interview with a specialized healthcare worker to discuss high scores and any associated need for additional care [9]. Thus, for the goals of screening to be met,

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patients with diabetes must be willing to complete a screening questionnaire in which they volunteer their mood state, and those with elevated scores must be willing to further discuss their problems in an interview with a specialized healthcare worker. If patients with diabetes find either component of psychological screening unacceptable, there will be a smaller yield of patients than anticipated.

Second, patients with diabetes who screen positive must be willing to accept a possible referral for additional psychosocial care. However, there are indications from studies in patients with diabetes [10,11] and other medical conditions (e.g. [12,13]) that only a minority of patients with elevated levels of psychological problems will accept formal psychological services. In these studies, many patients screening positive were found to be already in treatment, did not feel that a particular healthcare setting was an appropriate place for receiving help, or did not view themselves as needing help. This suggests that a substantial portion of patients with diabetes with heightened distress levels do not present with unmet needs that could be met with available and acceptable psychological treatment [14–16]. If this is the case for patients with diabetes, then screening might prove a costly and inefficient method to identify what could be a relatively small group of patients with diabetes with an addressable unmet need.

The aim of this paper is to investigate whether screening functions as efficiently as assumed and, thus, if it should be recommended as part of standard diabetes care. Therefore, we investigate:

1. the willingness of patients with diabetes to participate in screening;
2. the extent to which patients with diabetes who screen positive for psychological problems (1) have unmet needs, (2) have no need for help or (3) already are receiving help;
3. the extent to which introduction of screening improves referral to psychological care relative to a comparable period of clinical care as usual.

Patients and methods

Patients and procedure

For 9 weeks between March and June 2009, consecutive patients with diabetes visiting the diabetes outpatient clinic of the University Medical Center Groningen, in the Netherlands, were approached for this study. The University Medical Center Groningen is a tertiary referral centre with a relatively high percentage of complex patients with Type 2 diabetes under treatment. Exclusion criteria were: age younger than 18 years or older than 70 years, a chart notation of serious psychiatric problems such as schizophrenia or autism, not being able to read Dutch, visual problems, and pregnancy.

Patients who met the inclusion criteria received a letter 2 weeks prior to their appointment, inviting them to complete an online screening questionnaire assessing depressive symptoms and diabetes-related distress, as part of standard clinical

care. A web link to the questionnaire and a unique identification code were provided. The letter also indicated that a computer would be available at the outpatient clinic so that patients without the Internet at home could complete the questionnaire. For those patients who were unwilling to use the computer, paper questionnaires were available at the outpatient clinic, which could be completed either on the day of their appointment with the physician or at home (a prepaid return envelope was provided). Clinic schedules were checked daily to see whether the patients who had an appointment had already completed the screening questionnaire. If they had not, a research assistant approached them in the waiting room to once more invite them to complete the screening questionnaire.

Patients who scored above the cut-off scores on either depressive symptoms or diabetes-related distress received a phone call within 1 week from a psychologist to invite them for an interview at the University Medical Center Groningen. Patients who missed their diagnostic interview, or who were unable to attend, were offered a new appointment. The purpose of the interview was to identify the source of their depressive symptoms or diabetes-related distress, discuss whether they had a need for additional care, and to refer them to additional services when needed. The choice of additional services was tailored to the specific needs of patients, and could vary from watchful waiting to referral to a psychiatrist, or rehabilitation.

The comparison of rates of referral during screening to after screening was withdrawn and rates of referral to psychosocial care without screening were assessed 1 year later, i.e. for 9 weeks between March and June 2010. During this 1-year period, no changes to the provision of psychosocial care were implemented. A research assistant contacted each physician weekly and provided the list of patients who had been seen during that week. Physicians had to indicate whether each patient was referred to psychosocial psychiatry, psychology, social services or rehabilitation. We used similar criteria to select patients as in the screening study.

Patient identity was protected by unique patient identifiers. According to Dutch law, no further Institutional Review Board approval was required.

Measures

Data on diabetes (i.e. type of diabetes, duration of diabetes, HbA_{1c} values, treatment for diabetes, other chronic diseases) and lifestyle (BMI, smoking, alcohol use) were obtained from medical records, and demographics (i.e. age, gender) were provided by patients.

Depressive symptoms were measured with the Center of Epidemiologic Studies Depression (CES-D) scale [17]. The CES-D scale is a 20-item self-report questionnaire measuring depressive symptoms in the general population and in the medically ill. A total sum score is used (0–60), with higher scores indicating more depressive symptoms. A cut-off point of

≥ 16 is generally used to define patients at risk for clinical depression [18].

Diabetes-related distress was measured using the Problem Areas in Diabetes (PAID) scale [19,20]. The PAID consists of 20 Likert scale items. A total sum score is used (20–100), with higher scores indicating more diabetes-related distress. A cut-off point of ≥ 40 is generally used to define patients at risk for high diabetes-related distress.

Statistical analyses

Statistical analyses were performed using SPSS 16.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were calculated: means, frequencies and percentages. Chi-square tests and *t*-tests compared groups (i.e. respondents vs. non-respondents; interview vs. no interview) on socio-demographics, diabetes-related variables, the CES-D and the PAID scales. A χ^2 -test was also used to compare referral rates during screening vs. after cessation of screening.

Results

Willingness of patients to participate in the first stage of screening

A total of 499 patients with diabetes met the inclusion criteria and were invited to complete a screening questionnaire; 347 (69.5%) completed the screening questionnaire (Fig. 1).

The 152 patients with diabetes not completing the questionnaire included six with incomplete responses. Another 19 (13%) explicitly declined participation in screening when approached by a research assistant in the waiting room. Reasons for non-response were not directly assessed for the other 127 patients. However, 113 of these 127 non-respondents (88.9%; 74.3% of 152 non-respondents) did not show up at the outpatient clinic for their appointment with the physician.

The 152 patients with diabetes not completing the first stage of screening were significantly younger, had higher HbA_{1c}

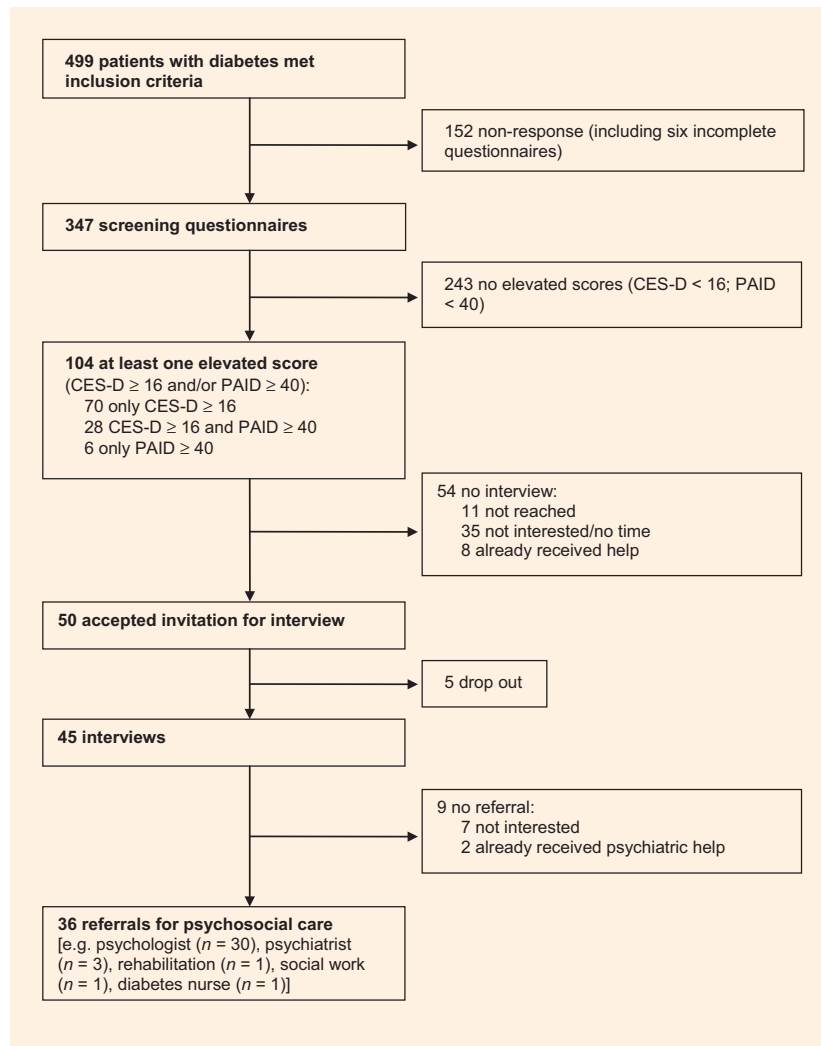


FIGURE 1 Screening flow chart. CES-D, Center of Epidemiologic Studies Depression; PAID, Problem Areas in Diabetes.

Table 1 Comparison of patients who completed the screening questionnaire ('respondents') vs. those who did not ('non-respondents')

	Respondents (n = 347*)	Non-respondents (n = 152*)	Significance
Age (mean ± sd)	50.4 ± 13.2	46.3 ± 13.3	(t = -3.16; P = 0.002)
Gender, n (%)			
Male	181 (52.2%)	79 (52.0%)	(χ ² = 0.001; P = 0.97)
Female	167 (47.8%)	73 (48.0%)	
Type of diabetes, n (%)			
Type 1	166 (48.0%)	69 (45.4%)	(χ ² = 0.28; P = .60)
Type 2	180 (52.0%)	83 (54.6%)	
Duration of diabetes (mean ± sd)	16.9 ± 12.3	15.8 ± 11.7	(t = -0.92; P = 0.36)
HbA1c mmol/mol	62 ± 8	66 ± 6	(t = 2.70; P = 0.007)
(mean ± sd)			
% (mean ± sd)	7.8 ± 1.4	(8.2 ± 1.6)	
Treatment, n (%)			
Tablets	31 (9.0%)	13 (8.6%)	(χ ² = 0.19; P = 0.91)
Tablets + insulin	80 (23.3%)	38 (25.0%)	
Insulin	233 (67.7%)	101 (66.4%)	
≥ 1 other chronic disease, n (%)			
No	183 (52.7%)	82 (53.9%)	(χ ² = 0.06; P = 0.80)
Yes	164 (46.3%)	60 (46.1%)	
BMI (mean ± sd)	29.6 ± 6.6	29.7 ± 7.3	(t = 0.08; P = 0.94)
Smoking			
No	270 (79.6%)	101 (67.3%)	(χ ² = 8.51; P = 0.004)
Yes	69 (20.4%)	49 (32.7%)	
Alcohol drinking			
Not at all	134 (39.6%)	62 (41.6%)	(χ ² = 0.23; P = 0.89)
Sometimes	159 (47.0%)	69 (46.3%)	
Daily	45 (13.3%)	18 (12.1%)	

*Number is slightly variable because of missing data.

values and were more likely to smoke than the 347 patients with diabetes who responded. The groups did not differ on other demographic, diabetes or lifestyle variables (Table 1).

Willingness of patients to participate in second stage of screening

Of the 347 patients with diabetes who completed the screening questionnaire, 104 (30.0%) scored above the cut-off of the CES-D and/or PAID scales. Of these 104 patients with elevated scores, 70 (67.3%) were identified as at risk for a clinical depression (CES-D ≥ 16), 28 (26.9%) were identified as at risk for both a clinical depression and high diabetes-related distress (CES-D ≥ 16 and PAID ≥ 40) and six (5.8%) were identified as at risk for high diabetes-related distress (PAID ≥ 40) (Fig. 1).

All 104 patients with elevated scores were telephoned to invite them for a psychological interview. Eleven (10.6%) could not be reached, despite several attempted telephone calls and a letter. Thirty-five (33.7%) were not interested or had no time, and eight (7.7%) already received help. Five patients accepted the invitation for the interview, but did not show up for their appointment; four patients cancelled because of physical problems that required attendance first, and one patient forgot the appointment and was not interested in a new appointment. In total, 45 patients (43.3%) with elevated scores accepted an interview.

Patients who received an interview did not differ from those who did not on the CES-D or the PAID scales, or on demographic, disease or lifestyle variables (all $P > 0.05$, data not reported).

Need for psychological care

Of the 104 patients with diabetes with heightened depressive symptoms or diabetes-related distress, 36 (34.6%) indicated an unmet need for which they would like a referral for additional psychosocial care. Fifty-eight patients (55.7%) were either not interested in additional care ($n = 42$), could not be reached after several attempts ($n = 11$) or dropped out before interview ($n = 5$), and 10 (9.6%) had already received help (Fig. 1).

Comparison with rates of referrals after cessation of formal screening

Of the 528 patients meeting the inclusion criteria in the comparison period 1 year after cessation of formal screening, six (1.1% of 528 patients) were referred for additional psychosocial services (i.e. three to a psychiatrist, two to a psychologist and one to rehabilitation) by their physician. This was significantly lower than the percentage of patients referred to psychosocial care during screening in 2009 ($n = 36$ of 499, 7.2%; $\chi^2 = 24.16$, $P < 0.0001$).

Discussion

International guidelines recommend routine screening as a method to identify patients with diabetes in need of psychological care [5,6]. However, there is no randomized trial yet demonstrating that routine screening improves patient outcomes over what is obtained in routine care with patients having similar access to discussions with professionals and services [21]. Our results raise questions as to whether screening is an efficient means to identify these patients. Many patients were missed by screening, despite being offered multiple ways to obtain it, and only a relatively small proportion of patients who screened positive desired a referral. In part, because of this low percentage of patients with a meetable unmet need, referral rates only increased from 1 to 7% when screening was implemented, compared with usual care.

The 30% of patients missed by screening had higher HbA_{1c} values, were younger and were more likely to smoke. Furthermore, three quarters of these patients did not show up at the outpatient clinic for their appointment with the physician, perhaps indicating low adherence to diabetes care in general, and not specifically low enthusiasm for screening or psychological services. Low treatment adherence, as well as high HbA_{1c}, young age and smoking have been associated with depression [22,22–24]. Thus, it seems that a group with specific characteristics indicative of a need for greater outreach to them, is being missed with screening.

Taken together, our results suggest that screening may not be as efficient as anticipated, nor cost-effective. Although this study did not incorporate a formal cost analysis, it shows that, to complete a referral, diabetes outpatient clinics would have to meet considerable costs. In this study, to refer 36 patients, 499 questionnaires had to be sent out; research assistants had to be present at the outpatient clinic on a daily basis to approach the non-responders; over 104 calls had to be completed to those with elevated scores, with many patients requiring multiple calls to reach them; and 45 psychological interviews had to be conducted by trained psychologists, some with multiple rescheduling after 'no-shows' or cancellation. Diabetes clinics contemplating implementation of a screening programme should thus compare the introduction of routine screening to alternative uses of resources.

One alternative approach to using a screening questionnaire in the first stage of routine screening for depression and diabetes-related distress would be to ask patients during consultation about their well-being [6], and whether they have an unmet need for psychological care or for support that they wish to have addressed [25,26]. Yet, it has not been established whether patients perceive an appointment with their physician as an appropriate occasion for seeking or receiving a referral for psychological treatment.

Another alternative would be to identify patients who consistently miss appointments or whose medical records indicate problems with adherence and offer them additional diabetes

education. There is some indication that a patient-tailored approach to diabetes education, which does not specifically target depressive symptoms, may nevertheless cause a significant improvement in glycaemic control and reduction in depression [27,28]. Reductions in depression after diabetes education have been found to be comparable with what is obtained with cognitive behaviour therapy [29], fluoxetine [30] and nortriptyline [31]. It might thus be sensible to monitor emotional well-being in more vulnerable patients, such as those with a history of depression or adjustment problems. A history of depression is an important risk factor for incident depression [32]. Bot *et al.* [33] have shown that the 2-year incidence of major depression was 42% in patients with diabetes with sub-threshold depression.

A recent review also concluded that, despite the promulgation of recommendations for screening patients with diabetes for depression, there is a lack of evidence that screening improves outcomes [21]. The review endorsed collaborative care for depression in patients with diabetes. Over 40 studies have now demonstrated that collaborative care involving a dedicated care manager improves outcomes for depression in primary care [34], and this work has been extended to patients with diabetes, demonstrating improvement in both depression and diabetes-specific outcomes [35]. However, despite its demonstrated efficacy, it should be noted that collaborative care requires considerable resources and there are very few instances of sustained implementation outside of research projects and especially well-organized and resourced clinical settings.

Perhaps there are lessons to be learned for diabetes care from guidelines for screening for depression in primary care. The United States Preventive Services Task Force (USPSTF) only recommends screening of patients for depression where there is an integrated depression management system, but not where such resources are not available.

Limitations

Results of this study should be interpreted in the context of its limitations. First, one of the endpoints of this study was referral to mental health services, based on a positive score on a depression questionnaire, which is not equivalent to a diagnosable depression for which empirically based treatment guidelines have been firmly established. While the CES-D scale is widely used for screening and is recommended by the International Diabetes Federation [6] as instrument of choice for screening of depression, it has a positive predictive value (i.e. the proportion of correct positive screening outcomes) of only approximately 40% for major depression [36]. Although there are alternative screening instruments available, such as the shorter Patient Health Questionnaire (PHQ-9), there are currently no indications that one scale performs better as a depression screener than another [37]. Second, we have no information as to whether patients' referrals were completed, or that they remained in mental health treatment long enough to obtain an adequate exposure to treatment or whether the

treatment was evidence based. Thus, our simple registry of whether a referral was made probably overestimates whether referral actually led to patient improvement.

Third, our two-stepped screening procedure using validated and reliable screening instruments is consistent with recommendations from literature. However, we put considerable effort into approaching patients and granted greater flexibility in scheduling and rescheduling follow-up interviews than might be sustained in routine care. This might have led to an overestimation of the number of patients willing to complete a screening questionnaire, or to participate in a psychological interview.

Finally, although low, the referral rates we found in usual clinical care 1 year later may nonetheless have been increased by the fact that screening previously had been in place. This may have sensitized physicians to psychological problems and, thus, to an increase in referral rates in usual clinical care.

Conclusions

Our results raise questions as to whether screening is the most efficient way to identify patients with diabetes with depressive symptoms and diabetes-related problems. Many patients were missed despite being offered multiple means for screening, especially those with low adherence to diabetes care in general. Furthermore, few patients screening positive desired a referral. Screening should be evaluated in the context of consideration of alternative ways to identify at-risk patients, including providing resources to deal with patients with already known adjustment and adherence problems, and integration of screening in collaborative care.

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None.

Competing interests

None declared.

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References

- Barnard KD, Skinner TC, Peveler R. The prevalence of co-morbid depression in adults with Type 1 diabetes: systematic literature review. *Diabet Med* 2006; **23**: 445–448.
- Ali S, Stone MA, Peters JL, Davies MJ, Khunti K. The prevalence of co-morbid depression in adults with Type 2 diabetes: a systematic review and meta-analysis. *Diabet Med* 2006; **23**: 1165–1173.
- Pouwer F, Beekman AT, Lubach C, Snoek FJ. Nurses' recognition and registration of depression, anxiety and diabetes-specific emotional problems in outpatients with diabetes mellitus. *Patient Educ Couns* 2006; **60**: 235–240.
- Li C, Ford ES, Zhao G, Balluz LS, Berry JT, Mokdad AH. Under-treatment of mental health problems in adults with diagnosed diabetes and serious psychological distress: the behavioral risk factor surveillance system, 2007. *Diabetes Care* 2010; **33**: 1061–1064.
- American Diabetes Association. Standards of medical care in diabetes. *Diabetes Care* 2009; **32**: S13–S61.
- International Diabetes Federation. *Global Guideline for Type 2 Diabetes*. 2005. Available at <http://www.idf.org/guidelines/type-2-diabetes> Last accessed 25 January 2012.
- Holland WW, Stewart S. *Screening in Disease Prevention: What Works?* Oxford: Radcliffe Publishing, 2005.
- Palmer SC, Taggi A, Demichele A, Coyne JC. Is screening effective in detecting untreated psychiatric disorders among newly diagnosed breast cancer patients? *Cancer* 2012; **118**: 2735–2743.
- Pouwer F, Tack CJ, Geelhoed-Duijvestijn PH, Bazelmans E, Beekman AT, Heine RJ *et al*. Limited effect of screening for depression with written feedback in outpatients with diabetes mellitus: a randomised controlled trial. *Diabetologia* 2011; **54**: 741–748.
- Snoek FJ, Kersch NY, Eldrup E, Harman-Boehm I, Hermanns N, Kokoszka A *et al*. Monitoring of Individual Needs in Diabetes (MIND): baseline data from the Cross-National Diabetes Attitudes, Wishes, and Needs (DAWN) MIND study. *Diabetes Care* 2011; **34**: 601–603.
- de Wit M, Delemarre-van de Waal HA, Bokma JA, Haasnoot K, Houdijk MC, Gemke RJ *et al*. Follow-up results on monitoring and discussing health-related quality of life in adolescent diabetes care: benefits do not sustain in routine practice. *Pediatr Diabetes* 2010; **11**: 175–181.
- Luttik ML, Jaarsma T, Sanderman R, Fleer J. The advisory brought to practice routine screening on depression (and anxiety) in coronary heart disease; consequences and implications. *Eur J Cardiovasc Nurs* 2011; **10**: 228–233.
- Tuinman MA, Gazendam-Donofrio SM, Hoekstra-Weebers JE. Screening and referral for psychosocial distress in oncologic practice: use of the Distress Thermometer. *Cancer* 2008; **113**: 870–878.
- van Scheppingen C, Schroevers MJ, Smink A, van der Linden YM, Mul VE, Langendijk JA *et al*. Does screening for distress efficiently uncover unmet needs in cancer patients? *Psychooncology* 2011; **20**: 655–663.
- Brown JS, Elliott SA, Boardman J, Ferns J, Morrison J. Meeting the unmet need for depression services with psycho-educational self-confidence workshops: preliminary report. *Br J Psychiatry* 2004; **185**: 511–515.
- Forsell Y. The pathway to meeting need for mental health services in Sweden. *Psychiatr Serv* 2006; **57**: 114–119.
- Radloff LS. The CES-D Scale: A self-report depression scale for research in the general population. *Appl Psychol Meas* 1977; **1**: 385–401.
- Beekman AT, Deeg DJ, Van Limbeek J, Braam AW, De Vries MZ, Van Tilburg W. Criterion validity of the Center for Epidemiologic Studies Depression scale (CES-D): results from a community-based sample of older subjects in The Netherlands. *Psychol Med* 1997; **27**: 231–235.
- Welch GW, Jacobson AM, Polonsky WH. The Problem Areas in Diabetes Scale. An evaluation of its clinical utility. *Diabetes Care* 1997; **20**: 760–766.
- Snoek FJ, Pouwer F, Welch GW, Polonsky WH. Diabetes-related emotional distress in Dutch and US diabetic patients: cross-cultural validity of the problem areas in diabetes scale. *Diabetes Care* 2000; **23**: 1305–1309.
- Pouwer F. Should we screen for emotional distress in type 2 diabetes mellitus? *Nat Rev Endocrinol* 2009; **5**: 665–671.
- Gottlieb SS, Khatta M, Friedmann E, Einbinder L, Katzen S, Baker B *et al*. The influence of age, gender, and race on the prevalence of depression in heart failure patients. *J Am Coll Cardiol* 2004; **43**: 1542–1549.

- 23 Lustman PJ, Anderson RJ, Freedland KE, de Groot M, Carney RM, Clouse RE. Depression and poor glycaemic control: a meta-analytic review of the literature. *Diabetes Care* 2000; **23**: 934–942.
- 24 Korhonen T, Broms U, Varjonen J, Romanov K, Koskenvuo M, Kinnunen T *et al.* Smoking behaviour as a predictor of depression among Finnish men and women: a prospective cohort study of adult twins. *Psychol Med* 2007; **37**: 705–715.
- 25 Garssen B, De Kok E. How useful is a screening instrument? *Psychooncology* 2008; **17**: 726–728.
- 26 Garssen B, Van der Lee M. Re: Screening for emotional distress in cancer patients: a systematic review of assessment instruments. *J Natl Cancer Inst* 2010; **102**: 506–508.
- 27 Rubin RR, Peyrot M, Saudek CD. The effect of a diabetic education program incorporating coping skills training on emotional well-being and diabetes self-efficacy. *Diabetes Educ* 1993; **19**: 210.
- 28 Peyrot M, Rubin RR. Modeling the effect of diabetes education on glycaemic control. *Diabetes Educ* 1994; **20**: 143–148.
- 29 Lustman PJ, Griffith LS, Freedland KE, Kissel SS, Clouse RE. Cognitive behavior therapy for depression in type 2 diabetes mellitus. A randomized, controlled trial. *Ann Intern Med* 1998; **129**: 613–621.
- 30 Lustman PJ, Freedland KE, Griffith LS, Clouse RE. Fluoxetine for depression in diabetes: a randomized double-blind placebo-controlled trial. *Diabetes Care* 2000; **23**: 618–623.
- 31 Lustman PJ, Griffith LS, Clouse RE, Freedland KE, Eisen SA, Rubin EH *et al.* Effects of nortriptyline on depression and glycaemic control in diabetes: results of a double-blind, placebo-controlled trial. *Psychosom Med* 1997; **59**: 241–250.
- 32 Nefs G, Pouwer F, Denollet J, Pop V. The course of depressive symptoms in primary care patients with type 2 diabetes: results from the Diabetes, Depression, Type D Personality Zuidoost-Brabant (DiaDDZoB) Study. *Diabetologia* 2012; **55**: 608–616.
- 33 Bot M, Pouwer F, Ormel J, Slaets JP, de Jonge P. Predictors of incident major depression in diabetic outpatients with subthreshold depression. *Diabet Med* 2010; **27**: 1295–1301.
- 34 Gilbody S, Beck D. Implementing screening as part of enhanced care: screening alone is not enough. In: Mitchell AJ, Coyne JC, ed. *Screening for Depression in Clinical Practice – An Evidence-Based Guide*. Oxford: Oxford University Press, 2010: 335.
- 35 Katon WJ, Von KM, Lin EH, Simon G, Ludman E, Russo J *et al.* The Pathways Study: a randomized trial of collaborative care in patients with diabetes and depression. *Arch Gen Psychiatry* 2004; **61**: 1042–1049.
- 36 Fechner-Bates S, Coyne JC, Schwenk TL. The relationship of self-reported distress to depressive disorders and other psychopathology. *J Consult Clin Psychol* 1994; **62**: 550–559.
- 37 Roy T, Lloyd CE, Pouwer F, Holt RI, Sartorius N. Screening tools used for measuring depression among people with Type 1 and Type 2 diabetes: a systematic review. *Diabet Med* 2012; **29**: 164–175.