UNIVERSITÀ DEGLI STUDI DI TORINO

The definitive version is available at:
http://linkinghub.elsevier.com/retrieve/pii/S0167527314001831

Screening of depression in cardiac patients: Is the HADS an effective tool?

Valentina Tesio [a,b,*,1], Stefania Molinaro [a,b,1], Lorys Castelli [c,1], Monica Andriani [d,1], Anna Laura Fanelli [d,1], Sebastiano Marra [d,1], Riccardo Torta [a,b,1]

[a] Clinical Psychology and Psycho-Oncology Unit, "Città della Salute e della Scienza" Hospital of Turin, Italy

[b] Department of Neuroscience, University of Turin, Italy

[c] Department of Psychology, University of Turin, Turin, Italy

[d] Cardiology Unit, Cardiovascular and Thoracic Department, "Città della Salute e della Scienza" Hospital of Turin, Turin, Italy

[*] Corresponding author at: Clinical Psychology and Psycho-Oncology Unit, "Città della Salute e della Scienza" — Molinette Hospital of Turin, Corso Bramante 88/90, 10126, Turin, Italy. Tel.: +39 3331461865; fax: +39 011 6334349. E-mail address: valentina.tesio@unito.it (V. Tesio).

[1] This author takes responsibility for all aspects of the reliability and freedom from bias of the data presented and their discussed interpretation.

Depression can have a significant and negative impact on the course, mortality and quality of life in patients with cardiovascular disease (CVD) [1] and [2]. Literature reports a 20% prevalence of Major Depressive Disorders (MDD) in patients with myocardial infarction [3] and a prevalence ranging from 35% to 70% in hospitalized patients with heart failure [4]. Despite the fact that it has been suggested that the presence of depression is strongly linked with adverse cardiovascular disease (CVD) outcomes and has a two-fold increase in the risk of new cardiac events in coronary heart disease (CHD) [1] and [2], the presence of depression is still under-diagnosed, especially in the cardiology hospital setting. Conducting diagnostic interviews to all patients would be costly for the healthcare system in terms of both time and money. It is therefore crucial that an early assessment with a self-report scale promotes an easy but accurate first-step screening. A useful questionnaire widely used in CVD patients is the "Hospital Anxiety and Depression Scale" (HADS) [5]. The HADS is an easy and rapid self-report instrument specifically constructed for physically ill patients [5]. Unlike anyone else, in fact, it does not include somatic symptoms (i.e. sleep disorders, loss of appetite), which can be related not only to depression, but also to the medical illness itself and that could unjustifiably increase the score, leading to an overestimation of depression. To date, no definitive conclusions have been drawn regarding the best cut-off value for the depressive subscales of the HADS (HADS-D) [6], [7] and [8]. Recently, Bunevicius and colleagues suggested that "5" was the best cut-off for screening for Major Depressive Episodes (MDE) in Coronary Artery Disease (CAD) patients who are undergoing cardiac rehabilitation [6]. In the same study, the fact that was emphasised was that this cut-

off value could not be generalized to other cardiac pathologies, such as ACS, given the different clinical features.

On these bases, we aimed to investigate the best cut-off value for depression screening in chronic CAD and also in Acute Coronary Syndrome (ACS) inpatients, another relevant cardiac disease.

Receiver Operating Characteristics (ROC) curves were plotted, using, as criterion, one of the gold-standard clinician-rated diagnostic tools: the Montgomery–Asberg Depression Rating Scale (MADRS) [9].

Included in the analyses were 106 patients with chronic CAD and 244 patients with ACS, from a pool of 616 consecutive inpatients evaluated in the Cardiology Unit of the "Città della Salute e della Scienza" Hospital of Turin. Within 3 days of admission, all patients that gave their written informed consent completed the HADS and then had an interview with an expert psychologist who filled in the MADRS.

The MADRS is a semi-structured clinical interview rated by an expert clinical psychologist/psychiatrist. Following the recommendations, the cut-off value of 11 was used to tally a patient as depressed (≥ 11) or not (< 11). The HADS is a self-rating instrument divided into two subscales assessing anxiety (HADS-A) and depressive (HADS-D) symptoms. For the purpose of our study, only the depression subscale score (HADS-D) was analysed. The demographic characteristics of the final sample are presented in Table 1.

Table 1
Demographic and clinical characteristics of patients with Acute Coronary Syndrome (ACS) and chronic Coronary Artery Disease (CAD).

Variable		CAD (N = 106)	ACS (N = 244)
Age	Mean (SD)	70.13 (9.87)	67.61 (12.07)
Sex	N (%)		
Male		72 (67.9)	186 (76.2)
Female		34 (32.1)	58 (23.8)
Educational level	Mean (SD)	9.10 (4.19)	9.33 (4.28)
Marital status	N (%)		
Single		9 (8.5)	19 (7.8)
Married/cohabiting		81 (76.4)	177 (72.2)
Divorced		11 (10.4)	15 (6.1)
Widowed		5 (4.7)	33 (13.5)
Employment status	N (%)		
Employed		21 (21.6)	61 (28)
Unemployed/homemaker		9 (9.3)	15 (7)
Retired		67 (69.1)	142 (65.1)

Patients with chronic CAD reported a mean (SD) MADRS and HADS-D raw score of 6.73 (5.31) and 4.13 (3.60), respectively, while ACS patients reported a mean (SD) score of 5.37 (4.64) and 3.89 (3.60), respectively. According to the MADRS, 17.9% of CAD and 12.7% of ACS patients were found to be depressed. As far as ROC curves were concerned, area Under the Curve (AUC) was .794 for CAD and .882 for ACS group, confirming that the accuracy of the test was good. Sensitivity, specificity, positive (PPV) and negative (NPV) predicted values for each possible cut-off values are presented in Table 2. Provided that screening instruments are primarily expected to be highly sensitive, data showed that the best compromise between high sensitivity and high specificity was the cut-off of 5 for CAD and the cut-off of 6 for ACS patients. In both cases, the PPVs were low (35% in CAD and 37% in ACS), but this result is not surprising given the relatively low prevalence of depression in these samples.

Table 2
Psychometric properties at each cut-off values of the Hospital Anxiety and Depression Scale – depression subscale (HADS-D) for the screening of clinically relevant depressive symptoms in Coronary Artery Disease (CAD) and Acute Coronary Syndrome (ACS) patients.

		N (%)	Sensitivity % (95% CI)	Specificity % (95% CI)	PPV % (95% CI)	NPV % (95% CI)	Accuracy %	AUC (95% CI)
Coronary Artery Disease (CAD)	≥4	54 (50.9)	84.2 (59.5–95.8)	56.3 (45.3–66.8)	29.6 (18.4–43.8)	94.2 (83.1–98.5)	62.5	.794
	≥5	**40 (37.7)**	**73.7 (48.6–89.9)**	**70.1 (59.2–79.2)**	**35 (21.1–51.7)**	**92.4 (82.5–97.2)**	**72.1**	(.67–.92)
	≥6	29 (27.3)	68.4 (43.5–86.5)	81.6 (71.6–88.8)	44.8 (27–64)	92.2 (83.2–96.8)	80.8	
	≥7	19 (17.9)	57.9 (34–78.9)	90.8 (82.2–95.7)	57.9 (34–78.9)	90.8 (82.2–95.7)	86.5	
	≥8	16 (15)	42.1 (21.1–66)	90.8 (82.2–95.7)	50 (25.5–74.5)	87.8 (78.8–93.4)	83.7	
	≥9	14 (13.2)	36.8 (17.2–61.4)	91.9 (83.6–96.4)	50 (24–76)	87 (77.9–92.8)	87.7	
Acute Coronary Syndrome (ACS)	≥4	105 (43)	90.3 (73.1–97.5)	63.8 (57–70.2)	26.7 (18.7–36.3)	97.8 (93.3–99.4)	67.2	.882
	≥5	86 (35.2)	83.9 (65.5–93.9)	71.80 (65.2–77.6)	30.2 (21–41.2)	96.8 (92.4–98.8)	73.4	(.81–.95)
	≥6	**68 (27.9)**	**80.6 (61.9–91.9)**	**79.8 (73.7–84.9)**	**36.8 (25.6–49.4)**	**96.6 (92.4–98.6)**	**79.9**	
	≥7	50 (20.5)	74.2 (55–87.5)	87.3 (81.9–91.3)	46 (32–60.5)	95.9 (91.7–98)	85.7	
	≥8	37 (15.2)	67.7 (48.5–82.7)	92.5 (87.9–95.5)	56.8 (39.6–72.5)	95.2 (91–97.5)	89.3	
	≥9	24 (9.8)	54.8 (36.3–72.2)	96.7 (93.1–98.6)	70.8 (48.8–86.6)	93.6 (89.3–96.3)	91.4%	

PPV, positive predictive value; NPV: negative predictive value; AUC: area under the receiver operating curve. Optimal cut-off values in bold.

Given the negative effects of depression on cardiac patients, several clinical guidelines have recommended early screening and evaluation for treatment of depression [10]. In order to efficiently carry out the two-step procedure recommended by the clinical guidelines [10], the choice of a rapid, but accurate, first-step screening tool is crucial.

Results of our study suggest that 5 is the best cut-off value for the screening of depression in chronic CAD patients during the hospitalization period, confirming the results found by Bunevicius and colleagues in CAD patients [6]. However, as the authors suggested in their study [6], it seems that this cut-off value cannot be generalized to other CVDs. Going further with previous studies, our data showed that the cut-off with the best psychometric properties for ACS inpatients is 6.

As well as a high sensitivity, both these optimal cut-off values showed a high specificity in addition to high NPVs. In both the pathologies, in fact, more than 9 out of 10 negative cases according to the HADS were really non-depressed patients according to the MADRS (NPV = 92% in CAD and 96% in ACS). Clinically, the high sensibility and specificity of these cut-off values allow the healthcare provider to reduce the number of the clinical interviews necessary to complete the assessment of depression, reducing considerably the burden in terms of both time and money.

In conclusion, our study suggests that the HADS may be considered a good first-step self-rating screening tool in the attempt to detect cardiac inpatients with clinically relevant depressive symptoms who would benefit from a more accurate second-step assessment. Besides, in order to perform a more accurate screening procedure, a specific cut-off value should be used according to the different cardiovascular pathologies. Specifically, we recommend a cut-off of 5 for CAD patients and a cut-off of 6 for ACS patients. This result confirms once again that CVDs cannot be considered as a unique monolithic clinical pathology, not only from a cardiological standpoint, but also from a psychological one.

Acknowledgements

References

[1]   B.D. Thombs, P. de Jonge, J.C. Coyne, et al. Depression screening and patient outcomes in cardiovascular care: a systematic review. JAMA, 300 (18) (2008), pp. 2161–2171

[2]   N. Frasure-Smith, F. Lespérance. Depression and cardiac risk: present status and future directions. Postgrad Med J, 86 (1014) (2010), pp. 193–196

[3]   B.D. Thombs, E.B. Bass, D.E. Ford, et al. Prevalence of depression in survivors of acute myocardial infarction. J Gen Intern Med, 21 (1) (2006), pp. 30–38

[4]   N. Lossnitzer, W. Herzog, S. Störk, et al. on Behalf of the Competence Network Heart Failure. Incidence rates and predictors of major and minor depression in patients with heart failure. Int J Cardiol, 167 (2013), pp. 502–507

[5]   A.S. Zigmond, R.P. Snaith. The hospital anxiety and depression scale. Acta Psychiatr Scand, 67 (1983), pp. 361–370

[6]   A. Bunevicius, M. Staniute, J. Brozaitiene, R. Bunevicius. Diagnostic accuracy of self-rating scales for screening of depression in coronary artery disease patients. J Psychosom Res, 72 (2012), pp. 22–25

[7]   K.Z. Bambauer, S.E. Locke, O. Aupont, M.G. Mullan, T.J. McLaughlin. Using the Hospital Anxiety and Depression Scale to screen for depression in cardiac patients. Gen Hosp Psychiatry, 27 (2005), pp. 275–284

[8]   J.E. Haworth, E. Moniz-Cook, A.L. Clark, M. Wang, J.G. Cleland. An evaluation of two self-report screening measures for mood in an out-patient chronic heart failure population. Int J Geriatr Psychiatry, 22 (2007), pp. 1147–1153

[9]   S.A. Montgomery, M. Asberg. A new depression scale designed to be sensitive to change. Br J Psychiatry, 134 (1979), pp. 382–389

[10] J.H. Lichtman, J.T. Bigger Jr., J.A. Blumenthal, 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, 118 (17) (2008), pp. 1768–1775