Symptom Reporting on the Beck Depression Inventory Among Post-Myocardial Infarction Patients: In-hospital Versus Follow-up Assessments

Running head: Depressive Symptom Reporting Post-Myocardial Infarction

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ABSTRACT

Objective: Depressive symptoms following myocardial infarction (MI) are often assessed using self-report questionnaires, such as the Beck Depression Inventory (BDI). No studies have examined whether depressive symptom scores assessed by self-report questionnaires during hospitalization post-MI are influenced by factors related to the acute event or hospitalization compared to subsequent outpatient assessments of the same patients. The objective of this study was to compare BDI total scores, somatic scores, and cognitive/affective scores among post-MI patients in-hospital versus at post-discharge follow-up.

Methods: Secondary analysis of data from two existing cohorts of post-MI patients (Groningen, The Netherlands and Toronto, Canada). In-hospital BDI scores and follow-up scores were compared using paired samples *t*-tests.

Results: There were 1,556 patients from the Groningen sample with BDI data in-hospital and at 3-months post-MI and 229 patients from Toronto with data in-hospital and at 6-months post-MI. BDI total, somatic, and cognitive/affective scores did not differ significantly between in-hospital and follow-up assessments in either sample. Similarly, there were no substantive differences in symptom composition in either sample. Somatic symptoms accounted for 66.3% of total BDI scores in-hospital versus 64.9% at 3-months post-MI for Groningen patients and for 62.1% of total scores in-hospital versus 64.3% at 6-months post-MI for Toronto patients.

Conclusion: Overall BDI total scores, somatic scores, and cognitive/affective scores did not differ between in-hospital and subsequent outpatient assessments. The timing of when depressive symptoms are assessed post-MI does not appear to influence the overall level of BDI scores or the composition of symptoms that are reported.

Key words: Beck Depression Inventory; Cardiovascular disease; Depression, Myocardial infarction; Psychometrics.

INTRODUCTION

Major depressive disorder (MDD) may be present in 1 in 5 patients following myocardial infarction (MI) [1-3]. Both MDD as assessed by a diagnostic interview and symptoms of depression as assessed by self-report questionnaires are associated with an increased risk of morbidity and mortality post-MI [4-7]. MDD and symptoms of depression are also associated with greater disability [8], poorer quality of life [9], and higher health care costs [10] post-MI.

Depressive symptoms are often assessed during hospitalization for acute MI using self-report questionnaires [4-7]. Among these, the Beck Depression Inventory (BDI) [11] has been used more than any others in post-MI research [4, 7, 12-14]. A 2011 meta-analysis on post-MI depression and cardiovascular outcomes [4], for instance, reported that 13 of 27 studies that used a self-report questionnaire to measure depressive symptoms used the BDI. Only 2 studies used the revised version of the BDI, the BDI-II [15]. Given the extensive data on the BDI in patients with cardiovascular disease, a 2006 report from the U.S. NHLBI [12] recommended that the instrument be used in epidemiologic studies on depression in this population.

The BDI assesses both somatic and cognitive/affective symptoms of depression. Somatic symptoms of depression may overlap substantially with symptoms that are common following MI, including appetite disturbances, sleep disturbances, and fatigue. This has led some experts to suggest that scores on self-report depression symptom questionnaires may reflect both symptoms of depression and cardiac disease severity [5, 16, 17]. This may be of particular concern when assessing depressive symptoms during hospitalization for acute MI because at that time cardiovascular-related symptoms may be the most severe and some symptoms, such as appetite and sleep, may be exacerbated by the hospitalization itself [18-20]. Alternatively, it has been suggested that assessing depressive symptoms during hospitalization compared to outside of the hospital several months following the cardiovascular event could also result in elevated

cognitive/affective symptoms, such as sadness [18], because emotions related to the cardiovascular event or the hospitalization itself may be most intense closer to the time of the event.

Several studies [21-22] have reported depression rates or depressive symptom levels during hospitalization for acute MI versus outside of the hospital subsequent to discharge, but no studies have compared the characteristics of symptoms elicited on self-report depression symptom questionnaires, such as the BDI, during hospitalization versus at a later time point. Thus, the objective of the present study was to assess whether total scores, somatic symptom scores, and cognitive/affective symptom scores on the BDI among post-MI patients were higher in-hospital versus at 3- or 6-month follow-ups when patients were no longer in the hospital.

METHOD

Patients/Participants and Procedure

This was an exploratory, secondary analysis of data from existing post-MI cohorts from Groningen, The Netherlands [7, 23] and Toronto, Canada [24].

Groningen Post-MI Patients. The Groningen post-MI sample consisted of patients with confirmed MI admitted to 1 of 10 hospitals throughout Groningen, The Netherlands between September 1999 and November 2002. Patients were eligible for enrollment if they met the World Health Organization (WHO) Multinational Monitoring of Trends and Determinants in Cardiovascular Disease (MONICA) criteria for MI [25]. Eligible patients were approached for informed consent and enrollment during hospitalization for acute MI. Study participants completed self-administered questionnaires, including the BDI, during hospitalization and at 3-, 6-, 9-, and 12-months post-MI. Beginning at 3 months post-MI, patients with scores on the BDI of 10 or higher were assessed for a depressive disorder with a standardized psychiatric interview and those with a depressive disorder were randomized to receive treatment for depression or

usual care. Thus, no patients received treatment as part of the study intervention until after the 3-month assessment. Only hospitalization and 3-month post-MI data were used in this study and only patients who completed all BDI items in-hospital and at 3-months post-MI were included in analyses. The data collection protocol for this study was approved by the institutional review board at each study hospital.

Toronto Post-MI Patients. The Toronto post-MI sample consisted of patients with a confirmed MI admitted to 1 of 12 coronary care units in Toronto, Ontario, Canada between January 1997 and April 1999. Post-MI patients were selected from a cohort of post-acute coronary syndrome (ACS) patients who were hospitalized with either MI or unstable angina. As with the Groningen post-MI patient sample, all patients diagnosed with MI met the WHO MONICA criteria for MI. Patients were eligible for enrollment if they were medically stable and able to read or speak English. Research nurses approached eligible patients for informed consent and enrollment on the 2^{nd} to 5^{th} day of hospitalization, at which time study participants completed self-report questionnaires, including the BDI. Patients were also contacted 6- and 12-months post-MI and completed the questionnaires again. This study used hospitalization and 6-month post-MI data. Only patients who completed all BDI items in-hospital and at 6-months post-MI were included in analyses. This study was approved by the institutional review boards at the University of Toronto and the University Health Network.

Measures

BDI. Symptoms of depression were assessed using the 21-item BDI [11]. BDI items consist of four statements, scored 0 to 3, with higher scores indicating increasing symptom severity. Respondents are instructed to describe the way they have been feeling during the past week. There is extensive evidence for the validity and reliability of the BDI in both psychiatric and non-psychiatric populations [26], including post-MI patients [12]. A cutoff score of ≥ 10 is

typically used to identify patients with at least mild symptoms of depression [26]. Studies have reported several different factor structures for the BDI. A recent meta-analysis of these factor structures [27] found that the BDI appears to be measuring three factors reflecting negative attitudes towards the self, performance impairment, and somatic symptoms. For the purpose of this study, negative attitudes towards the self and performance impairment were combined to create a cognitive/affective component. Following this, scores on items 1 to 10 and 12 to 14 (*sadness, pessimism, past failure, loss of pleasure, guilty feelings, punishment feelings, self-dislike, self-blame, suicidal thoughts or wishes, crying, withdrawal, indecisiveness, physical appearance concerns*) were summed to calculate cognitive/affective symptom scores. Items 11 and 15 to 21 (*irritability, work ability, sleep disturbances, tiredness or fatigue, appetite disturbances, weight disturbances, health worries, sexual disinterest*) were summed to calculate somatic symptom scores.

Medical Variables. Killip class [28], measured on a 4-point scale, was used to indicate the presence of heart failure at the time of the MI. Killip class and diabetes mellitus, history of angina, history of MI, hypercholesterolemia, and hypertension were determined during hospitalization for MI.

Analysis of the Data

To compare sociodemographic and clinical characteristics between patients who completed the BDI in-hospital and at follow-up and those who completed the BDI in-hospital, but not at follow-up, independent samples 2-tailed *t*-tests were performed for continuous variables (e.g., age), and chi-square tests were performed for discrete variables (e.g., gender). To test whether total BDI scores, somatic symptom BDI scores, and cognitive/affective symptom BDI scores changed from the in-hospital assessment to the follow-up assessment, paired samples 2-tailed *t*-tests were performed. The proportion of patients who scored 10 or higher on the BDI

in-hospital versus at follow-up was assessed using McNemar's test. We also tested whether individual item scores differed between in-hospital and follow-up assessments using the Mann-Whitney U-test. The Mann-Whitney U-test was used because BDI item scores are ordinal with only four response options (0 to 3). Hochberg's Sequential Method [29] was used to maintain a family-wise Type I error rate of $\alpha < .05$ for multiple item comparisons.

As a sensitivity analysis we examined whether total scores, somatic symptom scores, and cognitive/affective symptom scores changed from in-hospital to follow-up assessments among men and women separately in the Groningen post-MI patient sample using paired samples 2-tailed *t*-tests. This was not done for the Toronto post-MI patient sample as there were fewer women in the sample.

Because of concern about whether patient dropout may have influenced results, we reran all analyses using inverse probability weighting generalized estimating equations (GEE) [30] to account for missing-at-random patient dropout. Among patients with complete data, this method weights data more heavily from patients more similar to patients who dropped out between in-hospital and follow-up assessments compared to data from patients less similar to patients who dropped out. To obtain patient weights for the GEE model, a logistic regression model was fit for the probability of response at follow-up using all in-hospital patient characteristics (Table 1) and cognitive and somatic BDI scores to compute weights separately by sample. This method was used rather than multiple imputation, for instance, due to the large number of categorical variables used in the analysis, including all 21 BDI items and sociodemographic variables, in the context of a relatively small sample size in the Toronto sample.

RESULTS

Sample Characteristics

Groningen Post-MI Patients. Of the 2,177 post-MI patients in the Groningen sample, 1,778 (81.7%) completed all BDI items in-hospital, and 1,556 of the 1,778 (87.5%) completed all BDI items both in-hospital and at 3-months post-MI. Mean age for the 1,556 patients who had in-hospital and follow-up data available was 60.5 years (standard deviation [SD] = 11.4), and 1,265 (81.3%) were male. Patient sociodemographic and clinical characteristics are shown in Table 1. The mean age for the 222 patients who completed the BDI in-hospital, but not at follow-up, was 62.5 years (SD = 13.0), and 159 (71.6%) were male. Patients who completed the BDI in-hospital and at follow-up were significantly younger compared to patients who completed the BDI in-hospital, but not at follow-up ($t(1772) = 2.5$, $p = .013$). Men were more likely than women to provide follow-up data (($\chi^2(1) = 11.4$, $p = .001$).

Toronto Post-MI Patients. Of the 913 post-ACS patients in the Toronto sample, 482 were post-MI patients. Of these, 417 (86.5%) completed all BDI items in-hospital, and 229 of the 417 (54.9%) completed all BDI items both in-hospital and 6-months post-MI. Mean age for the 229 patients who had in-hospital and follow-up data available was 60.3 years (SD = 11.3), and 184 (80.3%) were male (Table 1). The mean age for the 188 patients who completed the BDI in-hospital, but not follow-up, was 61.2 years (SD = 12.6), and 129 (68.6%) were male. There was no significant difference in age between patients who completed both assessments and those who completed the BDI in-hospital, but not at follow-up ($t(415) = 0.8$, $p = .443$). Men were more likely than women to provide follow-up data ($\chi^2(1) = 7.6$, $p = .006$).

BDI Scores In-hospital Versus at Follow-Up

Groningen Post-MI Patients. The mean total BDI score in-hospital was 6.9 (SD = 6.2) for all 1,778 patients who completed the BDI in-hospital, of whom 479 (26.9%) scored 10 or higher. For the 1,556 patients who had complete BDI data in-hospital and at the 3-month follow-up, the mean total BDI score in-hospital was 6.7 (SD = 6.1) compared to 6.8 (SD = 6.1) at

follow-up ($t(1555) = -0.9$, $p = .392$). Of patients with in-hospital and follow-up data, 407 (26.2%) scored 10 or higher in-hospital compared to 393 (25.3%) at follow-up ($p = .450$). Specifically, 155 (10.0%) patients scored 10 or higher in-hospital only, 141 (9.1%) scored 10 or higher at follow-up only, 252 (16.2%) scored 10 or higher at both time points, and 1008 (64.8%) scored 9 or lower at both time points.

Among the 1,556 patients who completed the BDI at both time points, somatic symptom scores did not differ significantly between in-hospital (mean = 4.5, SD = 3.4) and follow-up assessments (mean = 4.4, SD = 3.2; $t(1555) = 0.4$, $p = .700$), nor did cognitive/affective symptom scores (in-hospital mean = 2.3, SD = 3.5; follow-up mean = 2.4, SD = 3.6; $t(1555) = -1.9$, $p = .057$). Overall, somatic symptoms accounted for 66.3% of total BDI scores in-hospital versus 64.9% at 3-months post-MI, a raw difference of 1.4% (Table 2). The results were substantively unchanged when men and women were compared separately (not presented). Mean somatic symptom item scores in-hospital and at follow-up are shown in Table 3 and mean cognitive/affective symptom item scores in-hospital and at follow-up are shown in Table 4. When only data from 548 patients who scored 10 or higher on the BDI in-hospital, at follow-up, or at both time points were considered, somatic symptoms accounted for 64.6% of total scores in-hospital versus 62.2% at follow-up, a raw difference of only 2.4%.

Toronto Post-MI Patients. The mean total BDI score in-hospital was 7.7 (SD = 6.8) for all 417 patients who completed the BDI in-hospital, of whom 119 (28.5%) scored 10 or higher. Among the 229 patients with BDI data both in-hospital and at 6-month follow-up, mean in-hospital score was 6.7 (SD = 6.9) compared to 6.6 (SD = 6.7) at follow-up ($t(228) = 0.3$, $p = .785$). In-hospital, 53 (23.1%) scored 10 or higher compared to 55 (24.0%) at follow-up ($p = .864$). Specifically, 16 patients (7.0%) scored 10 or higher in-hospital only, 18 (7.9%) scored 10

or higher at follow-up only, 37 (16.2%) scored 10 or higher at both time points, and 158 (69.0%) scored 9 or lower at both time points.

Among the 229 patients with data at both time points, there were no differences between somatic symptom scores in-hospital (mean = 4.2, SD = 3.4) and at follow-up (mean = 4.3, SD = 3.4; $t(228) = -0.4$, $p = .663$) or cognitive/affective symptom scores in-hospital (mean = 2.6, SD = 4.3) and at follow-up (mean = 2.4, SD = 4.2; $t(228) = 1.0$, $p = .333$). Somatic symptoms accounted for 62.1% of total BDI scores in-hospital versus 64.3% at 6-months post-MI, a raw difference of 2.2% (Table 2). Mean somatic symptom item scores in-hospital and at follow-up are shown in Table 3 and mean cognitive/affecitve symptom item scores in-hospital and at follow-up are shown in Table 4. Considering only data from 71 patients who scored 10 or higher in-hospital or at follow-up, the proportion of total scores accounted for by somatic scores was 59.0% in-hospital and 59.9% at follow-up, a raw difference of 0.9%.

For both the Groningen and Toronto samples, conducting the analyses with inverse probability weighting did not change the results, either in terms of magnitude of estimated in-hospital and follow-up score differences or by generating a different conclusion based on p values (not presented).

DISCUSSION

The main finding of the present study was that total BDI scores, somatic symptom BDI scores, and cognitive/affective symptom BDI scores did not differ between in-hospital assessments and follow-up assessments several months later, when patients were no longer in the hospital. Furthermore, the proportion of symptoms accounted for by somatic symptoms versus cognitive/affective symptoms did not differ meaningfully between the in-hospital assessments and post-discharge assessments several months later. The raw difference in percentage of total scores accounted for by somatic item scores was less than 3% for both the Groningen and

Toronto samples, even when only patients who scored at least 10 on the total BDI in-hospital or at follow-up were considered. One reason why these findings are important is because they may challenge assumptions that depressive symptoms at the time of the acute event can be dismissed as just a reaction to the acute event.

One previous study [18] compared the composition of depressive symptoms from a structured clinical interview among 35 patients diagnosed with depression in-hospital following MI to the symptoms reported by 35 different patients diagnosed with depression 6 months or 12 months post-MI, but who were not depressed during the index admission. That study found that loss of interest was much less common in-hospital (49%) than post-discharge (83%) and that appetite disturbances were more frequent in-hospital (86%) compared to post-discharge (63%), but noted no other differences in symptom profiles. The authors concluded that, generally, depression symptomatology is similar in-hospital and post-discharge. Key differences between that study and the present study were that a structured diagnostic interview was used in the prior report versus a self-report measure in the current study and that symptom profiles were compared across two relatively small groups of patients rather than within the same patients at different time points, as in the present study. Nonetheless, the conclusions of the two studies are consistent and show that, although there is some variation in individual symptoms, there are not substantively meaningful differences in overall levels of symptoms or in the proportion of somatic versus cognitive/affective scores between in-hospital and post-discharge assessments.

In the present study, 88% of patients from the Groningen sample completed the BDI in-hospital and at the 3-month follow-up, whereas only 55% of patients from the Toronto sample with in-hospital data completed the 6-month follow-up. In both samples, when only patients with both in-hospital and follow-up data were considered, symptom levels and the proportion of patients who scored 10 or higher on the BDI were similar. Inverse probability weighting GEE

analyses supported the conclusion that symptom profiles are similar whether assessed in-hospital or subsequently once patients have been discharged. If one were to look at all patients reporting data at either time point, on the other hand, results from the Groningen sample were stable over time, whereas data from the Toronto sample would suggest that patients with higher BDI scores in-hospital are less likely to provide data at follow-up assessments. A 2006 systematic review [13] on the prevalence of depression post-MI included only one study that reported symptoms of depression based on a self-report questionnaire at multiple time points. That study [31], which used the BDI-II, reported that the proportion of patients who scored at least 10 on the BDI-II was 35% in-hospital (n=550), 39% at 30 days post-MI (n=466), 39% at 6 months post-MI (n=464), and 30% at 1 year post-MI (n=486), although the composition of patients at each time point differed. Although results from the present study suggest that the level of depressive symptoms does not differ between in-hospital and subsequent assessments, more studies are needed that assess depressive symptoms or depression rates at multiple time points and use current analytical methods to account for missing data in models. There are few existing studies that have tracked symptoms or diagnoses over time, and they have generally been limited by a small number of assessments and by using either all data available at each time point, meaning a different sample at each time point, or by using only data from patients who completed all time points, which is an important limitation [32].

The findings of this study suggest that the timing of assessment of depressive symptoms among post-MI patients does not meaningfully influence the results and that it should not be assumed that symptoms present during hospitalization are simply reactive. This study did not address, more broadly, whether self-report questionnaires may be overly influenced by somatic symptoms common to both depression and cardiovascular disease, regardless of the timing of the assessment. The results of two previous studies [33, 34] suggest that the degree to which somatic

symptom influence scores may be measure specific. One study found that BDI-II somatic symptom scores of post-MI patients were not higher than somatic scores of psychiatry outpatients matched on cognitive/affective symptom scores, sex, and age [34]. A second study [33], which used similar methods, on the other hand, found that somatic symptoms had a substantially greater influence on scores on the original BDI, which includes several somatic symptom items that were removed in developing the BDI-II.

There are potential limitations that should be considered in interpreting the results of this study. One is that the findings of this study are based on a self-report questionnaire and, therefore, may not generalize to studies using a diagnostic interview for MDD. However, the majority of studies on depression in cardiovascular disease use self-report questionnaires [4], and the results of this study are directly relevant in that context. A second limitation is that we included only patients with completed data both in-hospital and at follow-up in the main analyses, and it is possible that these patients differed from those with incomplete data at these time points. In the Toronto sample, for instance, patients who did not provide follow-up data had higher BDI scores than those who provided data at both time points. Results based on inverse probability weighting GEE analyses, however, did not differ from analyses with only patients with complete data. A third limitation is that there were differences between the Groningen and Toronto samples in loss to follow-up such that the dropout rate was higher among the Toronto sample compared to the Groningen sample. One possible reason for this is that more time passed between the in-hospital assessment and the follow-up assessment for the Toronto sample than Groningen sample. Another possible reason was that the Toronto study was a longitudinal, observational study, whereas the Groningen study was a clinical trial. Although for the present study, only pre-treatment data from the Groningen study was used, the research infrastructure of the trial may have helped to maintain a low loss to follow-up. A fourth limitation is that we did

not evaluate changes in overall BDI scores across time for individual patients. A previous study of 475 post-MI patients [21], however, analyzed patterns of BDI scores every 3 months up to a year post-MI and, consistent with results from the present study, found that they were generally stable. They classified 82% of patients as having no significant symptoms of depression or a stable level of mild symptoms across time. A fifth limitation is that comorbidity and disease severity were not considered in analyses. Other possible limitations were that information regarding at what time point during hospitalization the Groningen sample was assessed was unavailable and that information regarding treatment or changes in treatment from in-hospital to follow-up for both the Groningen and Toronto samples was also unavailable. Finally, the results of this study may not apply to the revised BDI-II as a number of recent studies have underlined important differences between the BDI and the BDI-II in post-MI settings [33-35].

In summary, this study found that depressive symptoms on the BDI following MI are stable over time and that there is no reason to believe that assessing symptoms in the hospital will generate higher scores than out of the hospital. In addition, the composition of symptoms reported does not appear to be meaningfully different between in-hospital and subsequent outpatient assessments. This study did not address whether scores generated by self-report depression questionnaires may be influenced by the confounding of somatic symptoms post-MI with somatic symptoms of depression, although previous studies have addressed this issue with the BDI and BDI-II [33, 34]. Additional studies assessing the influence of somatic symptoms on the BDI, BDI-II, and other self-report depression measures that are commonly used in cardiovascular settings, such as the Patient Health Questionnaire-9 [36], are needed. Furthermore, although results from this study suggest that the level of depressive symptoms does not differ between in-hospital and subsequent assessments, additional studies are needed that

assess depressive symptoms or depression rates at multiple time points and use current analytical methods to account for not-missing-at-random data in models.

ACKNOWLEDGEMENTS

Ms. Delisle was supported by a Master's Training Award from the Fonds de la Recherche en Santé Québec. Dr Grace was supported by a New Investigator Award from the CIHR. Dr. Ziegelstein was supported by Grant R24AT004641 from the National Center for Complementary and Alternative Medicine and by the Miller Family Scholar Program of the Johns Hopkins Center for Innovative Medicine. Dr. Thombs was supported by a New Investigator Award from the CIHR and an Établissement de Jeunes Chercheurs award from the Fonds de la Recherche en Santé Québec. The Toronto study was supported by the Heart and Stroke Foundation of Canada. There was no industry funding for the study. The authors are grateful to Dr. Johan Ormel for allowing us to use data from the Groningen post-MI patient sample.

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Table 1. Sociodemographic and Clinical Characteristics

	Groningen Post-MI Patients (N = 1,556)	Toronto Post-MI Patients (N = 229)
Sociodemographic Characteristics		
Age in years, mean (SD)	60.5 (11.4)[a]	60.3 (11.3)
Male sex, n (%)	1,265 (81.3)	184 (80.3)
Clinical Characteristics		
Diabetes mellitus, n (%)	180 (11.6)[b]	41 (19.0)[g]
History of angina, n (%)	-----	42 (18.3)
History of MI, n (%)	212 (13.7)[c]	39 (17.0)
Hypercholesterolemia, n (%)	1,199 (77.7)[d]	75 (35.5)[h]
Hypertension, n (%)	503 (32.5)[e]	69 (32.1)[i]
Killip class I, n (%)	1,393 (90.3)[f]	185 (83.7)[j]

MI = myocardial infarction.

[a]n = 1,553; [b]n = 1,548; [c]n = 1,544; [d]n = 1,543; [e]n = 1,546; [f]n = 1,543; [g]n = 216; [h]n = 211; [i]n = 215; [j]n = 221.

Table 2. Proportion of Somatic versus Cognitive/Affective Symptom Scores In-hospital and at Follow-Up

		In-hospital Mean Scores			Follow-up Mean Scores			
Setting	N	Total BDI Score	Somatic Score[1] (% Total Score)	Cognitive/ Affective Score[1] (% Total Score)	Total BDI Score	Somatic Score[1] (% Total Score)	Cognitive/ Affective Score[1] (% Total Score)	Difference in Proportions of Somatic Scores[2]
Groningen	1,556	6.74	4.47 (66.3)	2.27 (33.7)	6.84	4.44 (64.9)	2.40 (35.1)	-1.4
Toronto	229	6.73	4.18 (62.1)	2.55 (37.9)	6.64	4.27 (64.3)	2.37 (35.7)	2.2

BDI = Beck Depression Inventory.

[1]Definition of somatic and cognitive/affective scores in text. [2]Difference is follow-up proportion minus in-hospital proportion.

Table 3. Somatic Symptom Item Scores In-hospital and at Follow-Up

	Groningen				Toronto			
Item	In-hospital (Mean/SD)	3-Months Post-MI (Mean/SD)	Difference in Somatic Item Scores[1]	*p*-value	In-hospital (Mean/SD)	6-Months Post-MI (Mean/SD)	Difference in Somatic Item Scores[1]	*p*-value
11. Irritability	0.44/0.79	0.51/0.75	0.07	.001[2]	0.50/0.76	0.46/0.70	-0.04	.562
15. Work ability	0.66/0.76	0.71/0.71	0.05	.023	0.50/0.71	0.55/0.68	0.05	.195
16. Sleep disturbances	0.65/0.83	0.60/0.78	-0.05	.045	0.66/0.83	0.64/0.85	-0.02	.690
17. Tiredness or fatigue	0.90/0.63	0.89/0.59	-0.01	.517	0.77/0.64	0.73/0.60	-0.04	.376
18. Appetite disturbances	0.28/0.52	0.20/0.46	-0.08	<.001[2]	0.26/0.52	0.13/0.44	-0.13	<.001[2]
19. Weight disturbances	0.45/0.83	0.45/0.89	0.00	.693	0.31/0.73	0.72/1.08	0.41	<.001[2]
20. Health worries	0.48/0.63	0.48/0.63	0.00	.871	0.41/0.61	0.38/0.57	-0.03	.570
21. Sexual disinterest	0.61/0.91	0.60/0.87	-0.01	.485	0.76/0.97	0.66/0.94	-0.10	.092

MI = myocardial infarction.

[1]Definition of somatic scores in text. Difference is follow-up proportion minus in-hospital proportion. [2]Statistically significant based on Hochberg's Sequential Method.

Table 4. Cognitive/Affective Symptom Item Scores In-hospital and at Follow-Up

	Groningen				Toronto			
Item	In-hospital (Mean/SD)	3-Months Post-MI (Mean/SD)	Difference in Cognitive/ Affective Item Scores[1]	*p*-value	In-hospital (Mean/SD)	6-Months Post-MI (Mean/SD)	Difference in Cognitive/ Affective Item Scores[1]	*p*-value
1. Sadness	0.20/0.47	0.16/0.43	-0.04	<.001[2]	0.21/0.47	0.18/0.40	-0.03	.334
2. Pessimism	0.13/0.44	0.16/0.49	0.03	.014	0.18/0.49	0.21/0.54	0.03	.362
3. Past failure	0.09/0.35	0.11/0.38	0.02	.025	0.14/0.51	0.17/0.50	0.03	.227
4. Loss of pleasure	0.35/0.53	0.41/0.57	0.06	<.001[2]	0.39/0.65	0.35/0.58	-0.04	.324
5. Guilty feelings	0.11/0.38	0.09/0.34	-0.02	.102	0.12/0.37	0.10/0.42	-0.02	.533
6. Punishment feelings	0.22/0.74	0.15/0.61	-0.07	<.001[2]	0.18/0.63	0.08/0.42	-0.10	.013
7. Self-dislike	0.11/0.32	0.11/0.32	0.00	.595	0.21/0.48	0.17/0.44	-0.04	.250
8. Self-blame	0.15/0.41	0.16/0.43	0.01	.297	0.24/0.50	0.26/0.54	0.02	.542
9. Suicidal thoughts or wishes	0.05/0.24	0.05/0.24	0.00	.442	0.06/0.29	0.05/0.23	-0.01	.366
10. Crying	0.27/0.60	0.26/0.60	-0.01	.767	0.20/0.55	0.15/0.50	-0.05	.139
12. Withdrawal	0.12/0.37	0.18/0.42	0.06	<.001[2]	0.24/0.51	0.23/0.50	-0.01	.720
13. Indecisiveness	0.39/0.67	0.46/0.68	0.07	<.001[2]	0.24/0.52	0.26/0.59	0.02	.698
14. Physical appearance	0.09/0.40	0.10/0.38	0.01	.838	0.13/0.43	0.15/0.47	0.02	.390

concerns	

MI = myocardial infarction.

[1]Definition of somatic scores in text. Difference is follow-up proportion minus in-hospital proportion. [2]Statistically significant based on Hochberg's Sequential Method.