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A preliminary study of negative appraisals and dysfunctional coping associated with post-traumatic stress disorder symptoms following myocardial infarction

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ABSTRACT

OBJECTIVES: To investigate associations between PTSD symptoms following myocardial infarction (MI) and subjective experience of MI, negative perception of consequences, negative appraisals of symptoms, and use of dysfunctional coping strategies, as described by Ehlers and Clark's (2000) model of PTSD. **DESIGN:** Cross-sectional questionnaire study of people who experienced a MI within the previous 12 weeks (n = 74; 51% response rate). **METHODS:** Participants completed questionnaires assessing PTSD symptoms, subjective experience of MI, perception of consequences, appraisal of symptoms, and dysfunctional coping strategies. **RESULTS:** Sixteen percent of participants met DSM-IV criteria for PTSD and a further 18% reported moderate to severe PTSD symptoms. People with PTSD symptoms also had more somatic symptoms, anxiety, depression, and social dysfunction. PTSD symptoms were associated with perceived severity and danger of MI, a history of psychological problems, previous trauma, negative appraisal of symptoms, perceived severe consequences, and dysfunctional coping strategies. These variables were entered into a regression with MI and past history variables on Step 1, and appraisal and coping variables on Step 2. This showed that perceived consequences and dysfunctional coping were strongly associated with PTSD symptoms after controlling for MI and past history variables. **CONCLUSION:** The results of this preliminary study suggest perception of consequences and dysfunctional coping may be important in PTSD symptoms following MI.

INTRODUCTION

Approximately 150,000 people in the United Kingdom survive the acute stage of a heart attack or myocardial infarction (MI) every year (British Heart Foundation, 2000). It is widely acknowledged that psychological factors can significantly affect recovery (Petrie & Weinman, 1997). Anxiety and depression following MI are associated with failure to return to work, decreased levels of social activities (Melamed, Heruti, Shiloh, Zeidan & David, 1999), subsequent MI, increased hospitalisation costs and increased mortality (NHS Centre for Reviews and Dissemination, 1998). Furthermore, psychological problems following MI may contribute to poorer psychosocial adjustment over and above the actual severity of the MI (Melamed et al., 1999). Therefore, it is important to understand the psychological impact of MI, to identify patients who are significantly distressed following MI, and to provide appropriate and effective interventions (Mayou, Gill, Thompson, Day, Hicks, Volmink & Neil, 2000).

Recently there has been increasing interest in the occurrence of post-traumatic stress disorder (PTSD) following MI (Ginzberg, 2006; Owen, Koutsakis & Bennett, 2001; Spindler & Pedersen, 2005). Two reviews of PTSD following MI report prevalence rates of between 0% and 22%, with an average prevalence of around 15% (Gander & von Kanel, 2006; Spindler & Pedersen, 2005) with a larger number of people experiencing subclinical levels of PTSD symptoms (Dew, Roth, Schulberg, Simmons, Kormos, Trzepacz & Griffith, 1996; Green, Epstien, Krupnick and Rowland, 1997). PTSD symptoms following MI are associated with impaired social functioning, poor physical health (Ginzburg, Solomon, Koifman, Keren, Roth, Kriwisky, Kutz, David & Bleich, 2003), increased psychological distress, depression, anxiety, and somatic complaints (Chung, Berger & Rudd, 2007; Ginzburg 2006; Kutz, Garb & David, 1988), and adverse prognosis (Shemesh, Rudnick, Kaluski, Milovanov, Salah, Alon, Dinur, Blatt, Metzkort, Golik, Verd & Cotter, 2001; Shemesh, Yehuda & Milo, 2004).

Evidence suggests that survival rates following MI are greatly increased if medical care is sought within an hour of onset and PTSD symptoms may affect this in a number of ways. For example, research into PTSD in medical samples finds that PTSD symptoms are often associated with poor adherence to treatment or rehabilitation programmes and avoidance of medical consultations (Tedstone & Tarrier, 2003). In contrast, other research has shown that PTSD symptoms are associated with over-use of health care services (Deykin, Keane, Kaloupek, Fincke, Rothendler, Siegfried & Creamer, 2001). This could be due to a number of factors such as distress-related attendance, increased physical health problems or, in the case of MI, misinterpretation of PTSD symptoms, such as hyperarousal or re-experiencing, as a sign that another heart attack is about to happen (Green et al., 1997, Kutz, Shabtai, Solomon, Neumann & David, 1994).

Given the potential impact of PTSD symptoms following MI, understanding the circumstances under which PTSD symptoms develop may lead to improved outcome. Studies of PTSD symptoms following MI have identified various social risk factors, such as sociodemographic factors and lack of social support; individual risk factors, such as a history of psychological problems or trauma; and factors related to the event, such as dissociative symptoms and perceived severity of the MI (Spindler & Pedersen, 2005).

One potential area of study is the association between cognitive factors, in particular how individuals conceptualise and cope with their experience of MI and PTSD. Within the literature on adjustment following MI, emphasis is placed on the importance of individuals' perceptions and beliefs about their MI (Petrie & Weinman, 1997) and the type of coping strategies they employ (Bennett, Lowe, Mayfield & Morgan, 1999). For example, Chung, Berger & Rudd (2008) found that people who used emotion-focused or avoidant coping strategies were more likely to report PTSD symptoms and other symptoms of psychological distress.

This focus on appraisal and coping is also found in the literature on the development and maintenance of PTSD symptoms, where negative appraisals and the use of dysfunctional coping strategies are thought to be important (Ehlers & Clark, 2000). Ehlers and Clark (2000) identify several types of negative appraisals associated with PTSD. Negative appraisals related to the event itself include appraisals of actions taken or emotions experienced at the time of the event. Negative appraisals related to the sequelae of a traumatic event include interpretations of PTSD symptoms, other people's reactions and the consequences of the trauma. Ehlers and Clark (2000) go on to suggest that such negative appraisals are maintained when individuals engage in a number of cognitive and behavioural control strategies such as avoidance and thought suppression. These strategies are maladaptive because they exacerbate and maintain PTSD symptoms. They also prevent change in negative appraisals because the individual does not expose himself or herself to new information.

The role of negative appraisals and dysfunctional coping strategies in the development and maintenance of PTSD symptoms has been supported by research into PTSD symptoms in various samples, including assault victims (Ehlers & Clark, 2000; Dunmore, Clark & Ehlers, 1997, 1999 & 2001), ambulance staff (Clohessy & Ehlers, 1999), hospital accident and emergency department personnel (Laposa & Alden, 2003), and former political prisoners (Ehlers, Maercker & Boos, 2000). There is also support for appraisals and coping being associated with PTSD symptoms following health events such as spinal cord injury (Agar, Kennedy & King, 2006), road traffic accidents (Ehlers & Steil, 1995; Steil & Ehlers, 2000; Ehlers, Mayou & Bryant, 1998; Stallard & Smith, 2007), stroke (Field, Norman & Barton, 2008), and pre-eclampsia in pregnancy (Engelhard, van Rij, Boullart, Ekhart, Spaanderman, van den Hout & Peeters, 2002). However, the variables proposed by Ehlers & Clark (2000) have not been examined in relation to MI.

The present study therefore aimed to add to the literature on the development and maintenance of PTSD symptoms following MI by examining differences in appraisals of symptoms, perceptions of consequences and dysfunctional coping strategies in people with and without PTSD symptoms following MI. Following on from the above it was hypothesised that PTSD symptoms would be associated with negative appraisals, perceptions of consequences and dysfunctional coping strategies.

METHOD

Design

Cross-sectional study of 74 people who had experienced a MI within the previous 12 weeks (mean 7.88 weeks, SD = 2.37). Participants completed questionnaires assessing PTSD symptoms, subjective experience of MI, perceptions of consequences, appraisal of symptoms, dysfunctional coping strategies, and demographic characteristics.

Participants

Participants were attending cardiac rehabilitation programmes at two hospitals. Inclusion criteria were that they experienced a MI, as recorded in medical notes, within the previous 12 weeks. People were excluded if they had a concurrent serious illness, experienced a previous MI, or did not speak English. One hundred and forty six eligible people were identified (46 from site one; 100 from site two), of which 74 (51%) agreed to participate. Participants did not differ from non-responders in age, gender, depression or anxiety[1].

The majority of participants were male (n=56, 76%), married (n=52, 70%), Caucasian (n=67, 91%), and not employed or retired (n=48, 65%). Forty three percent (n=33) had no educational qualifications and 54% (n=38) were qualified at GCSE level or above. The

average age was 62 years (SD = 11.3). Eight percent (n=6) were hospitalised for cardiac problems other than MI. Overall, participants were comparable to other studies of MI patients (Bennett et al., 1999; Bennett & Brooke, 1999).

Measures

Background information (e.g. demographic details, history of psychological problems) was measured using a few items incorporated into the questionnaire pack. Standard questionnaires were used to measure general psychological health and PTSD symptoms, and specifically designed questionnaires were used to measure subjective experience of MI, cognitive appraisal, and coping processes as follows:

Psychological health was measured using the General Health Questionnaire – 28 item version (GHQ-28; Goldberg & Hillier, 1979). This measures symptoms of anxiety, depression, somatic symptoms and social dysfunction and also provides a combined total score of psychological distress. The GHQ-28 is a reliable and validated screening tool for psychiatric symptoms in medical settings (Goldberg, Gater, Ustun, Sartorius, Piccinelli, Gureje & Rutter, 1997). The scale provides both a continuous measure of symptoms and a measure of psychiatric disorder, using the recommended cut-off of seven or above for each subscale (Goldberg et al., 1997).

PTSD SYMPTOMS and Trauma History was measured using the Posttraumatic Diagnostic Scale (PDS: Foa, 1995). The PDS has been used in research investigating cognitive factors associated with PTSD symptoms (e.g. Dunmore et el., 1997, 1999, 2001) and in a previous study on PTSD symptoms following MI (Bennett & Brooke, 1999). The PDS is a self-report questionnaire that measures trauma history and PTSD symptoms in accordance with DSM-IV criteria (American Psychiatric Association, 1994). The PDS has 17 items corresponding to the 17 PTSD symptoms listed in the DSM-IV with a response

scale of 0 “not at all” to 3 “almost always”. Further items measure impairment of functioning, perceived threat to life, symptom duration, time of onset of symptoms, and a checklist of prior trauma history. Participants who fulfil DSM-IV criteria A to F are identified if they report perceived threat and a response of helplessness or horror; indicate the presence of 1 or more re-experiencing symptoms; 3 or more avoidance and numbing symptoms; 2 or more arousal symptoms (as measured by a score of 1 or more on items within that subscale); duration longer than one month; and symptoms causing significant impairment. The PDS has established reliability and when used as a diagnostic measure it has a specificity of .75, a sensitivity of .89, and an 82% agreement with structured clinical interviews (Foa, Cashman, Jaycox & Perry, 1997). Symptom severity can also be calculated through combining scores for symptoms of re-experiencing, avoidance and numbing, and arousal, and using the following recommended cut-offs of: 0 = no PTSD, 1-10 = mild symptoms, 11-20 = moderate symptoms, 21-35 = moderate to severe symptoms and 36-51 = severe symptoms (Foa, 1995). All participants were asked to complete the PDS in relation to their MI.

Subjective Experience of MI was measured using four items that asked participants to rate the perceived severity of the MI, the extent to which they believed their life was in danger, how helpless and how terrified they felt during the MI. Items followed DSM-IV criterion A and were rated on a scale of 0-100.

Appraisal and coping were measured using a questionnaire based on measures used in previous research looking at these factors in samples with PTSD (e.g. Dunmore et al, 1999, 2001). Three subscales measured (1) negative appraisal of symptoms, (2) perceptions of consequences and (3) dysfunctional coping strategies as reported below. The questionnaire was piloted on six MI patients and reviewed by two cardiac rehabilitation nurses to check for ease of completion, face validity, and relevance to MI.

Negative appraisals of symptoms were measured by 10-item subscale (alpha = 0.73) that assessed participants' appraisals of post-traumatic symptoms following MI. For example "My reactions since the heart attack mean that I cannot cope", "If I cannot control my thoughts about the heart attack, I will go crazy". Participants were asked to rate how much they agreed with each item over the previous four weeks. Items were rated on a 7-point scale (ranging from 'totally disagree' to 'totally agree'). Scores on individual items were summed to provide a total score (range 0-42), where a higher score indicated more negative appraisals of symptoms.

Negative perceptions of consequences were measured by 8-item subscale (alpha = 0.91) that assessed participants' beliefs that the MI would have a permanent, negative impact on their life. For example "I will have problems with relationships", "I will have persistent problems dealing with medication and self care." Participants rated each item on the 7-point scale described above (range 0-48) with higher scores indicating more negative perceptions of consequences.

Dysfunctional coping strategies were measured by 14-item subscale (alpha = 0.85) that assessed how often participants used dysfunctional cognitive and behavioural control strategies in the previous month. Items included strategies of avoidance ("I have avoided stressful events"), cognitive avoidance ("I have tried to distract myself from distressing thoughts") and detachment ("I have tried to numb my emotions"). Participants rated how frequently they engaged in each strategy on a 4-point scale from 0 'never' to 3 'always' (range 0-42) with higher scores indicating more frequent use of dysfunctional coping strategies.

Procedure

Ethical approval was obtained from both hospitals. Eligible cases were identified from cardiac rehabilitation records, in consultation with medical staff. At site 1,

questionnaires were given to eligible individuals when they attended cardiac rehabilitation sessions. At site 2, the researcher was not present at cardiac rehabilitation sessions so questionnaire packs were sent by post. All participants received an information sheet, consent form and questionnaire pack. Once completed, the consent form and questionnaires were returned to cardiac rehabilitation staff or in a prepaid envelope. Participants who had not returned the questionnaires within three weeks were contacted again to maximise response rate. Thereafter, no further contact was made with individuals who did not return the questionnaires.

RESULTS

Data screening showed that a few variables were not normally distributed so nonparametric tests were used where possible. For parametric analyses PTSD symptom scores were transformed using a square root transformation (srPTSD), which restored the variable to normality. Less than 1% of the data was missing so these were substituted with means.

Presence of PTSD symptoms and other psychological distress

Twelve participants (16.2%) met DSM-IV criteria for PTSD as measured by the PDS (see methodology section). A further 13 (17.6%) of participants reported moderate or severe symptoms (a score of >10 on the PDS), and 49 (66.2%) reported no or low symptoms of PTSD ($\leq$10 on the PDS). Table 1 shows mean scores on measures of PTSD and other psychological distress for the whole sample and for participants with different levels of PTSD symptoms. It can be seen that participants with diagnostic PTSD reported significantly more symptoms of PTSD and psychological distress.

- insert Table 1 about here -

Relationship between experience of MI, appraisals, coping strategies and PTSD symptoms

Table 2 shows correlations between PTSD symptoms and main study variables. This shows that PTSD symptoms were associated with perceived severity and danger of the MI, appraisal and coping variables, and a previous history of psychological problems and trauma. PTSD symptoms were not associated with demographic characteristics such as sex, age, marital status, ethnic group, education, employment status, and social class.

- insert Table 2 about here -

The association between appraisal and coping variables and PTSD symptoms supports the hypotheses and Ehlers and Clark's model. Appraisal and coping variables were also related with each other. Negative appraisal of symptoms was strongly associated with negative perceptions of consequences (.68, $p<.001$), and moderately associated with use of dysfunctional coping strategies (.40, $p<.001$). Perceptions of consequences and use of dysfunctional coping strategies were also strongly associated (.56, $p<.001$).

However, dysfunctional coping strategies, assumed to be important in the development and maintenance of PTSD symptoms, overlap with avoidance symptoms of PTSD (Steil & Ehlers, 2000). A partial correlation between PTSD symptom severity and use of dysfunctional coping strategies was therefore carried out, controlling for the avoidance subscale of the PDS. The partial correlation was significant (.29, $p=0.014$) suggesting the association between dysfunctional coping strategies and PTSD symptom severity cannot be solely attributed to an overlap between avoidance control strategies and avoidance symptoms of PTSD.

Likewise, depression and PTSD are often co-morbid (Yule, Williams & Joseph, 1999). Depression is also associated with MI (Bennett et al., 1999). Therefore, it is possible

that the significant correlations between PTSD symptoms and the three main variables could be partly attributable to the presence of depressive symptoms. Further partial correlations were therefore carried out between PTSD symptom severity and the three variables in turn, controlling for GHQ-28 depression score. These were all significant: negative appraisals of symptoms (.24, p=0.04), negative perceptions of consequences (.44, p<.005), use of dysfunctional coping strategies (.24, p<.001), suggesting that the associations between PTSD symptom severity and negative appraisals of symptoms, negative perceptions of consequences and use of dysfunctional coping strategies were not solely attributable to the presence of depression.

Determinants of PTSD symptom severity

Hierarchical multiple regression analyses were conducted to evaluate whether appraisal variables predicted PTSD symptoms after controlling for MI severity and previous history.

Step 1 of the regression comprised MI severity, perceived danger, a history of previous psychological problems and previous trauma. Step 2 consisted of appraisal and coping variables. Results are shown in Table 3. It can be seen that in the first step a history of psychological problems was a significant predictor of srPTSD. However, when cognitive appraisal variables were entered on Step 2 this was no longer significant, and only negative perceptions of change and use of dysfunctional coping strategies were significantly associated with srPTSD severity. Negative appraisal of symptoms was not significantly associated with srPTSD severity. Overall, this model explained 77% of the variance in srPTSD scores.

- insert Table 3 about here -

DISCUSSION

In summary, this study found that 16% participants met criteria for acute PTSD following MI, which is consistent with the prevalence of 15% reported in reviews (Gander & von Kanel, 2006; Spindler & Pedersen, 2005). A further 18% reported moderate to severe PTSD symptoms. People who developed PTSD symptoms following MI were more likely to have a history of psychological problems and trauma, as well as greater current symptoms of depression, anxiety, somatic symptoms and social dysfunction. This is consistent with literature looking at vulnerability and comorbidity of PTSD in a range of samples. The findings of interest from this study are that appraisal of negative consequences and use of dysfunctional coping strategies are more predictive of PTSD symptoms than perceived severity of the MI, perceived danger during the MI, and a history of psychological problems or trauma. In contrast, negative appraisal of symptoms did not add significantly to the prediction of PTSD symptoms.

The finding that PTSD symptoms were not associated with perceived severity of the MI after appraisal and coping are included in the model is in contrast with research showing subjective perception of severity to be more important in PTSD than objective measures of illness severity (Kutz et al., 1994; Tedstone & Tarrier, 2003). However, it is consistent with a study of PTSD symptoms after MI carried out by Doerfler, Paraskos & Piniarski (2005) who also found that perceived severity of MI and perceived danger were not significantly associated with PTSD symptoms. This suggests perceived severity may be less important for predicting PTSD symptoms following MI than for predicting PTSD symptoms following other events. Alternatively it may be that whilst perceived severity is associated with general psychological distress, the pathway between perceived severity and PTSD is more complex and influenced by other factors, such as appraisal and coping. It would be interesting in future research, for example, to incorporate measures of objective severity of the MI,

conscious awareness or sedation during MI, and additional stress and support after MI.

The finding that negative appraisal of consequences and dysfunction coping were predictive of PTSD symptoms supports Ehlers and Clark's (2000) model of PTSD and is consistent with research looking at these factors in other samples (e.g. Agar et al., 2006; Ehlers, Mayou & Bryant, 1998; Ehlers & Steil, 1995; Steil & Ehlers, 2000; Laposa & Alden, 2003; Stallard & Smith, 2007). However, the finding that negative appraisals of symptoms did not contribute significantly to this model is inconsistent with this theory which argues that if individuals interpret their symptoms as evidence that they are 'going crazy' or cannot cope, it will increase distress and serve to maintain a sense of current threat from the traumatic event. Other research largely supports the importance of negative appraisals of symptoms in predicting PTSD symptoms up to six months after the event (e.g. Ehring, Ehlers & Glucksman, 2008). However, there are a few conflicting findings. For example, Field et al. (2008) did not find a longitudinal relationship between appraisal variables and PTSD in people following stroke. Thus the role of negative appraisals of symptoms in PTSD following MI requires further examination.

In contrast, the finding that negative appraisal of consequences, such as perceptions of permanent change, contributed to PTSD symptoms is consistent with theory and research into PTSD, and research into MI. For example, Kutz et al. (1994) found that people who anticipated significant disability in the early stages of recovery following MI were more likely to develop PTSD symptoms, regardless of the objective severity of the MI. Thus people who believe that their MI will have a permanent negative impact on their life will be less successful in adjusting and may go on to experience PTSD symptoms. This finding is consistent with both this aspect of Ehlers and Clark's (2000) theory of PTSD, and self-regulation theory, which looks at the impact of illness perceptions on psychosocial outcome. In particular, illness representations about perceived consequences of the illness overlap with

negative perceptions of consequences as measured here. Research in this area shows that perceptions of severe consequences in MI are associated with negative outcome. For example, Petrie, Weinman, Sharpe and Buckley (1996) found the belief that an MI had severe consequences was negatively associated with return to work after MI. Similarly, Sheldrick, Tarrier, Berry & Kincey (2006) found that PTSD symptoms after MI or subarachnoid haemorrhage were associated with more negative perceived consequences, illness identity, emotional response to the illness, and belief that it would be chronic.

Thus, the findings of this study are broadly consistent with other research into MI and PTSD and with theories of illness representations and PTSD, although Ehlers and Clark's (2000) model of PTSD is only partly substantiated. Ultimately, teasing out the direction of causality between appraisal processes, coping, and psychological distress has inherent difficulties, including construct overlap, which can be partly addressed by triangulation between studies using different measures and methods. For example, future research could look at appraisals from narratives, or be restricted only to people who report symptoms, and/or use more specific measures of different mood states, rather than measures of general psychological distress as in the current study. Prospective research is also needed to tease out the issue of causality following MI. In sum, the limited amount of research investigating these factors following MI, and the problem of construct overlap, means it is worth re-examining this using different measures and methods.

Limitations

There are a number of methodological factors that need to be considered before drawing conclusions from this study. First, the prevalence of PTSD symptoms in this sample should be treated with caution because it is based on a self-report questionnaire, a low response rate of 51% and, although the PTSD questionnaire was completed in reference to the MI, it is difficult to determine whether PTSD symptoms measured were only in relation to

the MI or influenced by other factors such as ongoing physical health problems. Secondly, other possible predictors of PTSD symptoms were not included in this study, such as objective MI severity, support, and neuroticism. no objective measure of MI severity was included so the contribution of actual MI severity to PTSD symptoms following MI could not be investigated. However, as stated, research into MI and other medical illnesses finds that PTSD is associated with perceived severity rather than medical severity of the illness (Kutz et al., 1994; Tedstone & Tarrier, 2003), although this was not found in the current study. Thus, future research should consider controlling for objective severity of MI when assessing the relationship between the variables investigated in this study and PTSD symptoms. Finally, the cross-sectional design prevents conclusions about the causality of PTSD symptoms. For example, it is possible that causality works in the opposite direction i.e. that PTSD symptoms result in negative appraisals; or that relationships between PTSD symptoms and other variables are due to content overlap such as between coping strategies and avoidance symptoms. Thus further research is necessary to clarify these points and conclusions from the present study should be cautious.

Summary and conclusion

In summary, this questionnaire study found that 16% of patients have PTSD following MI and a further 18% report moderate to severe PTSD symptoms. Perceived severity of the MI, previous psychological problems or trauma, and negative appraisal of symptoms were not associated with PTSD symptoms once negative appraisal of consequences and coping were included in the model, which explained 77% of the variance in PTSD symptoms after MI. This suggests that negative perceptions of consequences, such as permanent change, and dysfunctional coping may be important in PTSD symptoms after MI but further prospective research is needed to examine this in more detail to ascertain whether these variables are important in long-term PTSD symptoms following MI.

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Table 1. Mean scores for symptoms of PTSD and other psychological distress (N=74)

	Range	Total sample (n=74) Mean (SD)	Diagnostic PTSD[1] (n=12) Mean (SD)	Symptoms of PTSD[2] (n=13) Mean (SD)	No PTSD[3] (n=49) Mean (SD)
PTSD Symptoms (PDS)					
Re-experiencing	0-12	2.35 (2.82)	5.75 (2.96)	4.38 (3.23)	0.98 (1.23)*
Arousal	0-15	3.01 (3.34)	7.08 (3.73)	5.54 (3.71)	1.35 (1.28)*
Avoidance	0-19	3.62 (4.49)	10.25 (5.10)	6.15 (3.72)	1.33 (1.76)*
Total symptoms	0-41	8.99 (9.47)	23.08 (10.6)	16.08 (5.84)	3.65 (3.11)*
Other psychological distress (GHQ)					
Anxiety	0-21	4.82 (4.88)	10.17 (6.29)	8.08 (3.77)	2.25 (2.66)*
Depression	0-18	1.85 (4.14)	4.17 (5.94)	3.62 (4.86)	0.79 (2.87)*
Social dysfunction	0-21	9.30 (3.9)	13.25 (4.62)	10.0 (4.12)	8.13 (2.97)*
Somatic symptoms	0-21	4.62 (4.25)	8.67 (6.34)	5.77 (4.55)	3.23 (2.56)*
Total symptoms	5-71	20.24 (14.85).	36.25 (21.93)	27.46 (13.7)	14.4 (8.26)*

[1] Participants who fulfilled full diagnostic criteria for PTSD as measured by the PDS.

[2] Participants who reported moderate or severe symptoms on the PDS but did not fulfil diagnostic criteria for PTSD.

[3] Participants who did not fall in groups 1 or 2.

* Kruskal-Wallis test, $p<.005$

Table 2. Correlations between symptoms of PTSD, symptoms of psychopathology, demographic data, subjective experiences during MI, and cognitive factors

Factor	Correlation with total PTSD symptoms
Experience of MI	
Perceived severity of MI at the time it occurred	0.28*
Perceived danger of MI	0.38**
Time since MI	0.23
Appraisal and coping measures	
Negative perceptions of consequences	0.60**
Negative appraisals of symptoms	0.49**
Use of dysfunctional coping strategies	0.67**
Other psychological distress (GHQ-28)	
Total psychopathology	0.79**
Anxiety	0.75**
Depression	0.62**
Social dysfunction	0.55**
Somatic symptoms	0.55**
Previous history	
Previous psychological problems	0.32*
Experience of previous trauma (not including MI)	0.27*

Spearmans rank order correlations with 1-tailed significance levels for appraisal and coping measures, and 2-tailed significance levels for other variables; * $p<.05$, ** $p<.001$.

Table 3. Multiple regression analysis examining the role of subjective perception of MI, previous psychological problems and trauma, and appraisal and dysfunctional coping in PTSD symptoms following MI

	Beta	R square	R square change	F	Significance p
Step 1		0.50		5.66	<.001
Perceived severity of MI	.125				
Perceived danger of MI	.246				
Psychological problems prior to MI	.253*				
Experience of previous trauma	.157				
Step 2		0.77	0.349	13.95	<.001
Perceived severity of MI	.161				
Perceived danger of MI	.083				
Psychological problems prior to MI	.099				
Experience of previous trauma	.104				
Negative perceptions of consequences	.260*				
Negative appraisal of symptoms	.076				
Use of dysfunctional coping strategies	.412**				

* p<.05; ** p<.001; (N=74)

Footnote

1 Analysis on age and gender were based on all responders (n=74) compared to nonresponders (n=72). Data on anxiety and depression were only available at one hospital where they were measured as part of routine clinical assessment (Hospital Anxiety and Depression Scale; Zigmond & Snaith, 1983). Therefore analyses on anxiety and depression were based on a smaller sample of responders (n=22) compared to nonresponders (n=18) at this site.

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