

# Item nonresponse to psychosocial questionnaires was associated with higher mortality after acute myocardial infarction

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## Abstract

**Objective:** To examine the relationship between selective nonresponse to a psychosocial questionnaire and mortality after acute myocardial infarction (AMI).

**Study Design and Setting:** Two thousand six hundred and ninety AMI survivors after AMI hospitalization were recruited to complete a 30-day follow-up interview. Patients were classified into four groups (survey nonparticipation and complete, partial, and no item nonresponse) according to their degree of response to the Medical Outcomes Study (MOS) Social Support Survey (MOS-SSS). Cox proportional hazard models, adjusted for baseline sociodemographic, clinical, and psychosocial (i.e., social isolation) characteristics, were used to examine all-cause mortality, 3 years post-AMI, across the response levels.

**Results:** 13.9% of the eligible patients refused follow-up participation; MOS-SSS item nonresponse was present in up to 14.7% of participants and was more frequent among the elderly, socially disadvantaged, and those with higher clinical risk. A nonresponse mortality gradient existed, ranging from 8.9% (no item nonresponse) to 18.7% (complete item nonresponse) ( $P < 0.001$ ). After adjusting for baseline characteristics, complete item nonresponse remained significantly associated with mortality (hazard ratio: 1.33; 95% confidence interval: 1.02–1.73).

**Conclusions:** Item nonresponse to a social support questionnaire is associated with higher mortality post-AMI. Although explanatory factors may include age and baseline clinical risk, additional psychosocial and/or unmeasured factors may account for the poorer prognosis. © 2011 Elsevier Inc. All rights reserved.

**Keywords:** Psychosocial factors; Survey methodology; Response bias; Prospective cohort study; Acute myocardial infarction; Mortality

## 1. Introduction

Psychosocial factors are associated with increased mortality in various populations. For example, socioeconomic

status [1,2], depression [3], and social support [4–10] have been shown to reduce the likelihood for survival after acute myocardial infarction (AMI). Data for psychosocial variables, such as depression or social support, are acquired from questionnaires. Invariably, a proportion of potential respondents will not respond or will respond selectively to components of psychosocial questionnaires.

Nonresponse to psychosocial questionnaires may occur with disproportionate frequency in some subgroups more so than in others, including the elderly, those with greater comorbidity, and those with increased psychosocial distress [11–16]. Although previous studies have demonstrated poorer survival associated with nonparticipation in consent-based registries [17], clinical trials [18,19], and general health surveys [11,20–22], no study has systematically quantified the prognostic impact associated with selective nonresponse to psychosocial questionnaires.

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### What is new?

#### Key findings

- Selective item nonresponse to a psychosocial questionnaire was independently associated with increased mortality after acute myocardial infarction.

#### What this adds to what is known?

- Survey and/or item nonresponse to psychosocial questionnaires among those who have already consented to participate in a prospective cohort study may indicate underlying clinical risk or psychosocial factors with important prognostic implications.

#### What are the implications?

- Potential biases may be introduced into studies that include psychosocial measures if item nonresponse is ignored.
- Analyses that discard missing data may bias their results toward null, given that missing items may serve as a marker toward higher mortality.
- Nonresponse to items within psychosocial questionnaires may signify higher baseline risk for long-term mortality, which in turn, may warrant enhanced surveillance, evaluation, and management attentiveness among such high-risk individuals.

Accordingly, the purpose of this study was to examine the relationship between selective nonresponse to psychosocial questionnaires and mortality after an AMI, within a prospective cohort study. Given the association between social support and mortality after AMI, we used the validated MOS Social Support Survey (MOS-SSS) as our test case [23]. We hypothesized that selective nonresponse to the MOS-SSS would be associated with increased mortality. A secondary objective was to examine the extent to which the relationship between psychosocial nonresponse and mortality (if present) could be explained by traditional cardiovascular risk factors and demographic and psychosocial characteristics.

## 2. Methods

### 2.1. Data sources and study sample

We used data collected as part of the Socio-Economic and Acute Myocardial Infarction (SESAMI) study, a prospective longitudinal study of patients hospitalized with AMI throughout Ontario, Canada [24]. Specifically, data came from three sources: (1) a self-completed baseline questionnaire; (2) a telephone interview administered 30 days post-AMI, which addressed functional status,

psychosocial health (e.g., depression, social support), and health care use; and (3) health administrative databases to which patients were linked using encrypted health card numbers.

Complete details of the SESAMI study sample have been described previously [2,24,25]. Briefly, eligible patients were recruited from 53 hospitals between December 1999 and February 2003. Patients were included if they were English speaking and if two of the three AMI criteria were met: presence of symptoms, abnormal electrocardiographic findings, or elevated serum levels of cardiac enzymes. Patients who were younger than 19 years or older than 101 years, lacked a valid Ontario health card number, or were transferred to the recruiting hospital, were excluded. Patients unable to complete the baseline questionnaire because of death within 24 hours of admission, severe illness, or early discharge or transfer from hospital were also excluded. The original SESAMI sample consisted of 3,431 patients who consented to the baseline survey and subsequent data linkage. The focus of our study was on the response to the social support scale included in the 30-day follow-up interview. SESAMI baseline participants ineligible for the 30-day follow-up interview because of death ( $N = 87$ ) or insufficient follow-up information ( $N = 654$ ) were, therefore, excluded (Fig. 1). However, in general, the sociodemographic and clinical risk profile of ineligible subjects was similar to those of the subjects who were eligible but refused participation in the 30-day follow-up [24]. A total of 2,690 subjects remained available for analysis.

### 2.2. Social support and classification of survey response

Social support was assessed during the 30-day follow-up interview using the MOS-SSS. This is a 19-item self-reported measure, addressing four dimensions of perceived social support: informational/emotional, tangible, affectionate, and positive social interactions [23]. Patients indicated how often each type of support was available to them, if needed, according to the following five response options: None of the time (1), a little of the time (2), some of the time (3), most of the time (4), and all of the time (5). “Don’t know” and “not stated” options were also available. The responses to all questions were averaged and converted to a score out of 100 to obtain an overall score, with higher scores indicating greater support. The MOS-SSS has shown to have good internal consistency and reliability in populations with chronic ambulatory conditions, including coronary artery disease, cancer [23], and human immunodeficiency virus [26].

Depending on the degree of participation to the 30-day interview, we classified the patients into four types of respondents: survey nonparticipation because of refusal to consent (herein termed “survey nonparticipation,”  $N = 374$ ); survey participation but complete nonresponse to the MOS-SSS (herein termed “complete item

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