



Effect of job strain and depressive symptoms upon returning to work after acute coronary syndrome

Yoshimi Fukuoka*, Kathleen Dracup, Masako Takeshima, Noriko Ishii, Miyuki Makaya, Linda Groah, Erick Kyriakidis

Physiological Nursing, University of California San Francisco, 2 Koret Way, Box 0610, San Francisco, CA 94143, USA

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ABSTRACT

The purpose of this study was 2-fold: to assess whether job strain and depressive symptoms were independent predictors of the timing of return to work after acute coronary syndrome, and to determine whether the association of job strain and timing of return to work was moderated by depressive symptoms. In this 6-month longitudinal study, a total of 240 employed women and men who were admitted to hospital with acute coronary syndrome were consecutively recruited in the United States and Japan. A structured interview and medical record review were conducted to collect baseline data during hospitalization. At 2 and 6 months post-hospitalization, we mailed a questionnaire to assess the timing of first day of return to work and presence of depressive symptoms. It was found that job strain was a significant independent predictor of a later return to work, even after controlling for potential confounding variables. In addition, when depressive symptoms were treated as a time-dependent covariate, patients who had Beck Depression Inventory-II scores of ≥ 6 to < 16 or ≥ 16 were slower to return to work than patients with scores < 6 . An earlier return to work might be promoted by interventions focused on reducing psychological job demand, increasing perceived job control, and treating depressive symptoms.

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Introduction

Coronary heart disease carries an enormous worldwide social and financial burden. It is a leading cause of premature and permanent disability among workers in industrialized countries, accounting for 19% of social security disabilities in the United States alone (American Heart Association, 2003). It is estimated that the total costs associated with coronary heart disease in the United States during 2004 were \$132.2 billion; the estimated indirect costs, including lost wages and fringe benefits, amounted to \$57.8 billion (American Heart Association, 2003).

In general, the probability of return to work is inversely proportional to the length of absence from work, regardless of medical conditions (de Gaudemaris, 2000; Stay-at-Work and Return-to-Work Process Improvement Committee, 2006). For example, the chance of a patient ever returning to work drops by 50% by the 12th week of work absence (Stay-at-Work and Return-to-Work Process Improvement Committee, 2006). Interventions to

promote return to work rarely succeed if patients have been absent from work for a long period of time. Thus, it is important to understand why some patients return to work, while others delay their return to work, become permanently disabled, or prematurely exit the workforce. Previous studies have shown that traditional medical indicators of disease severity (e.g., left ventricular ejection fraction) do not necessarily predict return to work rates and patterns (Mark, Lam, Lee, Clapp-Channing, Williams, Pryor et al., 1992; Soejima, Steptoe, Nozoe, & Tei, 1999), while psychosocial factors such as depressive symptoms play an important role in whether patients return to work after hospitalization for acute coronary syndrome (Cay & Walker, 1988; Soderman, Lisspers, & Sundin, 2003).

Over the past three decades Karasek's demand-control model (Karasek, 1979), which incorporates the concept of worksite support (Johnson & Hall, 1988), has been used to assess job stress. Increasing evidence from industrialized countries suggests that psychological job strain, which is defined as the combination of greater psychological job demand and lower job control (decision latitude) is linked to coronary heart disease (Belkic, Landsbergis, Schnall, & Baker, 2004) and its risk factors, such as smoking, obesity, and high blood pressure (Bastian, Owens, Kim, Barnett, & Siegler,

* Corresponding author. Tel.: +1 415 514 1794; fax: +1 415 476 8899.
E-mail address: yoshimi.fukuoka@ucsf.edu (Y. Fukuoka).

2001; Kouvonen, Kivimaki, Vaananen, Heponiemi, Elovainio, Ala-Mursula et al., 2007; Landsbergis, Schnall, Pickering, Warren, & Schwartz, 2003a, b). Although Karasek's demand-control model was not originally developed to predict recovery of illnesses, the lack of a comprehensive theoretical model that applies to the predictors of return to work (Franché & Krause, 2002; Janssen, van den Heuvel, Beurskens, Nijhuis, Schroer, & van Eijk, 2003) and the acknowledged importance of psychosocial factors on return to work, prompted researchers to investigate whether job strain predicts the rate of return to work. Further, studies from several countries report that job strain is associated with an increased chance of developing psychological disorders, particularly depression, in general worker cohorts (Virtanen, Honkonen, Kivimaki, Ahola, Vahtera, Aromaa et al., 2007).

Approximately one in three patients who experience an acute coronary syndrome presents with mild to severe depressive symptoms during hospitalization (Thombs, Bass, Ford, Stewart, Tsilidis, Patel et al., 2006). Depressive symptoms are associated with a significantly increased risk of worse prognosis of their cardiac disease in patients recovering from acute coronary syndrome (Lichtman, Bigger, Blumenthal, Frasure-Smith, Kaufmann, Lesperance et al., 2008). There is substantial evidence that depressive symptoms are the most important psychosocial predictors on return to work (Soderman et al., 2003). However, there is little information regarding delay in returning to work or failure to return to work after acute coronary syndrome in relation to job strain and depressive symptoms. We hypothesized that the timing of return to work in relation to job strain might vary according to the level of depressive symptoms after acute coronary syndrome. In particular, this information might help identify a subgroup of patients for an intervention to prevent prolonged absence or permanent withdrawal from work.

The purpose of this study was 2-fold: (1) to examine whether job strain (high job demand and low job control) prior to acute coronary syndrome and depressive symptoms after acute coronary syndrome were independent predictors of the timing of return to work, as well as failure to return to work; and (2) to determine whether the association of job strain and timing of return to work after acute coronary syndrome was moderated by depressive symptoms.

Methods

Study design and sample

A 6-month prospective longitudinal design was used. The data were collected during hospitalization, and at 2 and 6 months following hospital admission. The investigators received approval from the Institutional Review Boards of all participating medical centers prior to data collection. Three clinical sites in the United States and 5 clinical sites in Japan participated in the study. All clinical sites were able to provide cardiac catheterization, 24-hour continuous cardiac care, and were qualified as either a secondary or tertiary emergency medical center. We initially approached 301 patients. Of those, 35 patients declined to participate, and 26 did not meet all inclusion criteria (3 worked less than 20 h/week prior to hospital admission, 4 did not intend to return to work after discharge, 13 were laid off or on disability, and 6 were not able to speak and/or read English and/or Japanese). Thus, a total of 240 patients from the United States and Japan who met all inclusion criteria were consecutively enrolled in the study during their hospitalizations from January 2004 to March 2006. Of these, 28 patients were lost to 6-month follow-up. Subjects lost to follow-up ($n = 28$) did not differ from respondents with respect to age, sex, cardiac risk factors, baseline depressive symptom score, job demand and job control scores, and job strain ($p > 0.05$).

Inclusion criteria

Study participants met the following inclusion criteria: (1) diagnosed with acute coronary syndrome (ST-elevation myocardial infarction (STEMI), non-ST elevation myocardial infarction (NSTEMI), or unstable angina); (2) hemodynamically stable (3) alert and oriented; (4) free from complicating malignancy or other debilitating illness; (5) able to speak and read English and/or Japanese; (6) currently employed and working >20 h/week prior to hospital admission; and (7) intending to return to work after discharge.

Procedures

Baseline data

A written explanation for this study was presented to participants by the researcher during the hospital stay. In addition, any questions were clarified, and a signed consent form was obtained. The structured interview was conducted at the bedside by research nurses who administered the following instruments: Beck Depression Inventory-II (BDI-II), Job Content Questionnaire, and Duke Activity Status Index and then reviewed patients' medical records. We also collected patients' home telephone number, e-mail address and home address, as well as the telephone number of an alternate contact person.

Follow-up

At 2 months and 6 months after hospital admission, all patients were mailed written questionnaires (BDI-II, Job Content Questionnaire, Duke Activity Status Index) including questions about their work status and the date they returned to work. If the patient had not returned to work at the 2 month point, they were directed not to answer the Job Content Questionnaire. A self-addressed envelope and reimbursement (\$5 in cash at 2 and 6 months) were sent with the questionnaires. Patients were asked to return the questionnaire within 7 days of receipt. Patients also received a phone call from the research nurse shortly after the questionnaires were mailed, to answer any questions. If the patient's telephone was disconnected or the research nurse could not reach the patient after three attempts, the research nurse called the secondary contact number.

Measures

Predictors

Job strain/characteristics. We used the Job Content Questionnaire to measure job demand (5 items), job control (9 items), the degree of support of the supervisor (4 items) and co-workers (4 items), job satisfaction (1 item) and job security (1 item). The Job Content Questionnaire is the most widely and internationally used instrument to assess job strain in relation to an increased risk of cardiovascular disease (Karasek, Brisson, Kawakami, Houtman, Bongers, & Amick, 1998) and has been validated in Japanese samples. This questionnaire was developed based upon the Karasek Job Strain Model (Karasek, 1979). All Job Content Questionnaire items were scored on a Likert-scale of 1 to 4, from strongly disagree to strongly agree. The score was calculated by each domain using the sum of equally weighted scores. To create an indicator of job strain, the job demand and job control scales were dichotomized at their median split and then four subgroups were created: (1) low strain (low demands and high control), (2) active (high demands and high control), (3) passive (low demands and low control), and (4) high strain (high demands and low control). We also dichotomized both total scores of supervisor and coworker support at work at their median, thereby creating high and low supervisor or coworker support at work groups for analysis. Since some patients

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