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# Study of the relationship between job stress, psychosocial variables, and different dimensions of physical health.

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## Introduction

From the scientific literature in health psychology one may conclude that chronic (job) stress has a negative influence on health status. It also appears that psychosocial dimensions are an important factor for the development of health complaints. Keeping this in mind, we have tried to figure out how the interaction between job stress and a number of psychosocial variables could be related to subjective health dimensions.

Studies in psychoneuroimmunology have shown that stress and also depression have an impact on the immune system. This was the starting point for our own immunological study. The aim of this study was to look at immunological differences between subjects reporting high and low levels of job stress and to evaluate to what extent psychological distress influences the relationship between stress and immunity.

In addition, we also studied the relationship between job stress and a number of physiopathological mechanisms that play a part in somatisation, specifically in functional dyspepsia. These two studies constitute the biological dimension of our research over the past 4 years.

## Method: subjects & measures

The *first population* studied consisted of nurses. There were 606 nurses in the target population. The actual response rate was 79%. Exclusion of subjects reporting a chronic medical or psychiatric disorder resulted in a total number of 452 subjects (mean age: 33 years; 23% were men, 77% were women) who filled out a number of questionnaires regarding job stress, psychological distress, lifetime somatisation, presence of somatoform disorders, fatigue, pain, and activity limitations.

For the immunological study, extreme groups were formed on the basis of the job stress and psychological distress dimensions. This resulted in a sample of 60 subjects split up into 3 groups: (1) high stress & high distress (n = 25); (2) low stress & low distress (n = 28); (3) high stress & low distress. Three distinct types of immune parameters were measured: peripheral blood mononuclear cell immunophenotypes, including NK cells and lymphocyte activation markers; acute phase proteins; interleukins.

The *second population* consisted of 56 patients, still professionally active, with a diagnosis of functional dyspepsia (functional upper abdominal complaints). The mean age in this population was 38 years; 48% were men and 52% were women. Each patient filled out a number of questionnaires regarding job stress, psychosocial variables, current somatisation, intensity of dyspepsia symptoms, fatigue, quality of life, and absenteeism. In addition, three physiopathological mechanisms known to play a part in functional dyspepsia were studied: visceral hypersensitivity, fundus relaxation, and gastric emptying.

The *third population* consisted of 700 nurses. Only 207 nurses returned their questionnaires (the mean age in this population was 34 years; 20% were men, 80% were women). The dimensions studied in this population were the same as in the functional dyspepsia patients with the exception of quality of life and the physiopathological mechanisms described above.

## Results

### *First study in a population of nurses.*

Both job stress and psychological distress were found to correlate significantly with lifetime somatisation, pain, fatigue, and activity limitations. A high level of job stress was associated with a higher prevalence of several somatoform disorders, such as chronic fatigue syndrome, irritable bowel syndrome (functional lower abdominal complaints), and fibromyalgia (diffuse muscle aches). With respect to the immunological study, a high level of job stress (irrespective of the degree of psychological distress) appeared associated with signs of immune activation (inflammation). In addition, there was also an indication of immune suppression (NK). Finally, significant correlations were found between immune activation markers on the one hand and subjective health indicators on the other.

### *Study in a population of functional dyspepsia patients*

Several dimensions of job stress correlated significantly with the intensity of functional dyspepsia symptoms and with the measured physiopathological mechanisms. Most of these associations remained significant upon application of multivariate techniques checking for psychosocial variables. Significant correlations were also found between several dimensions of quality of life and job stress. In this respect two dimensions of job stress appeared especially interesting: job insecurity and lack of social support from colleagues. Finally, logistic regression analysis with self-reported absenteeism as a dependent variable revealed that within this particular population current somatisation was the strongest predictor of absenteeism.

### *Second study in a population of nurses*

Logistic regression analyses with somatisation (defined as the presence of at least 4 medically unexplained somatic symptoms during the past month) and functional dyspepsia as dependent variables demonstrated that dimensions of job stress as well as specific personality variables (neuroticism in the case of somatisation and alexithymia in the case of functional dyspepsia) were significant predictors. The irritable bowel syndrome, on the other hand, was predicted only by the personality factor alexithymia. Within this population, lastly, absenteeism appeared equally predicted by somatisation (defined as the number of medically unexplained somatic symptoms experienced during the past month) and the job stress dimension 'lack of social support from colleagues'.

## Conclusions

From the biological dimension of the study we can conclude that professional stress is associated with signs of immune activation (or inflammation), irrespective of the degree of psychological distress. Secondly, job stress is significantly related to several physiopathological mechanisms studied in a population of functional dyspepsia patients, even after checking for psychosocial variables.

These studies done in a clinical population (functional dyspepsia patients) and a non-clinical population (nurses) have shown that dimensions of job stress on the one hand and psychosocial variables (such as psychological distress but especially the personality factors neuroticism and alexithymia) on the other are clear predictors of subjective health indicators, particularly somatisation and somatoform disorders. In this respect it is especially important to note that even when we checked for psychosocial variables, job stress still remained a strong predictor of somatisation.

Finally, the study of self-reported absenteeism has revealed that this dimension is best predicted by somatisation (patient population) or a by combination of job stress and somatisation (population of nurses).