

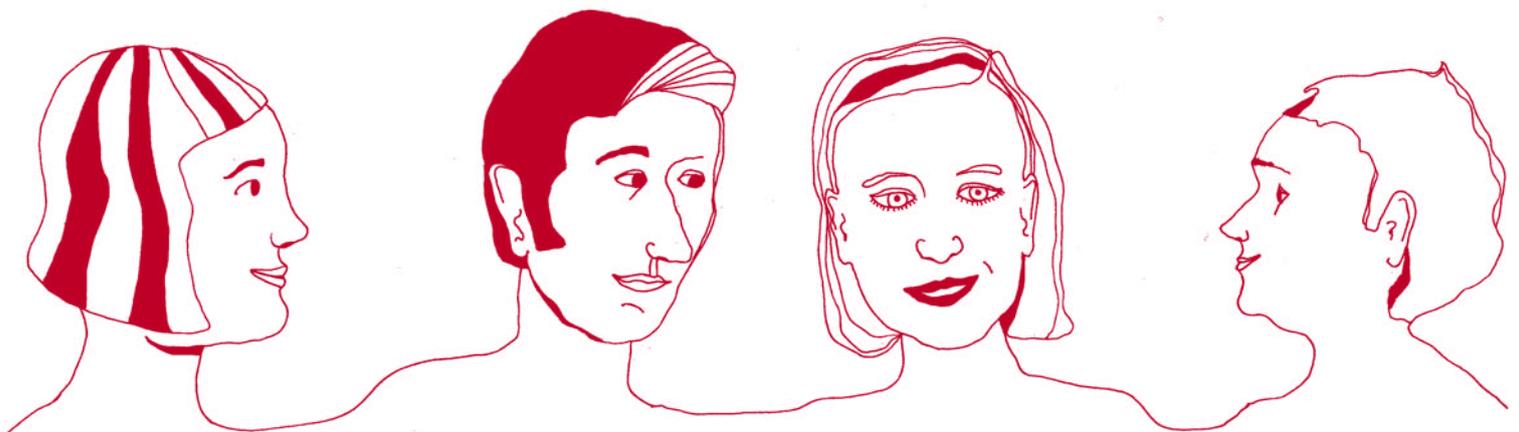
# Work characteristics and work-related psychosocial stress among general practitioners in Lithuania

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## Master of Public Health

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### Sammanfattning

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**Methods.** A cross-sectional study was made of 300 Lithuanian general practitioners. Psychosocial stress was investigated with a questionnaire based on the Reeder scale. Job demands were investigated with the Karasek scale. The analyses included descriptive statistics, interrelationship analysis between the different characteristics, and multivariate logistic regression to estimate odd ratios for each of the independent variables in the model.

**Results.** The study shows that 48% of the respondents could be classified as suffering from work related psychosocial stress by the Reeder scale. The highest job strain prevalence was among widowed, single and female GPs. The lowest job strain prevalence was among males and GPs of older age. Job strain occurs when job demands are high and job decision latitude is low.

**Conclusions.** The greatest risk to physical and mental health from stress occurs to general practitioners facing high psychological workload demands combined with low decision latitude in meeting those demands. High job demands, patient load more than 18 patients per day and young age of general practitioners can predict a statistically significant effect on job strain.

### Nyckelord

general practice, psychosocial stress, work characteristics, Lithuania



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### Key words

general practice, psychosocial stress, work characteristics, Lithuania

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## **INTRODUCTION**

Lithuania is one of the three Baltic States, which regained independence in 1990. Back in 1989, at the Congress of Physicians of Lithuania, the necessity to reform the health care system was discussed. To implement these reforms, a National Health Care Concept was adopted in 1991 by the Parliament. The main goal of the reform was to optimise the health care resources and services for a better health of the population. The development and reform of primary health care was underlined as a key factor in the total health care reform. The main concept urges development of primary health care services, reorienting them from disease centred episodic activities to patient needs, continuity, comprehensiveness, health promotion and disease prevention.

Primary health care services in Lithuania are delivered in primary health care centres by GPs, school and community medical posts (paramedical centres), ambulatories and polyclinics, women's consultancies, nursing hospitals, as well as ambulance service (stations and divisions). One of the health reform goals was that all practising physicians in primary health care (district internists and paediatricians) should be replaced by general practitioners (GPs) by 2005.

More than 300 public and private GP clinics are now in operation. At the moment, the vast majority of the health care facilities are publicly owned, but there are plans to partially privatise primary health care. For the most part private primary care takes the form of solo or small group physician-owned practices (1). Currently, more than 1000 GPs are practising in primary health care. Many GPs have still more than 2000 patients in their lists in spite of the reform statement that suggested an appropriate average of 1600

patients per GP. Not all of the GP graduates are practising family medicine; there is still a lack of GPs in rural areas. The financing principle of the health care system is based on compulsory health insurance and does not cover practice needs. Primary health care services are covered by capitation fees only. The average is about €20 per capita per year.

In 1996–97 operational service standards for GPs were defined. New tasks to deliver paediatric, gynaecologic and many other services were defined for GPs as primary health care. Since 1998, an existing partial gate-keeping role for GPs was switched to complete gate-keeping in 2002. The tasks of this new role have increased workload and responsibilities for Lithuanian GPs. The primary role of the Lithuanian GPs today continues to be in diagnosis and ongoing management of medical conditions, with consultations accounting for about 50% of their workload. The other 50% of their working time is consumed by patients' list and paperwork (2).

A number of studies have argued that general practice has become an increasingly stressful place to work (3-11) because of the increasing demands and constraints (6;11-17).

Stress research has significantly added to the medical literature over the past twenty years or so. It is known now that work can be an exciting source of challenge, where potentials and capabilities of the self are discovered and utilised. This positive stress perspective has been termed “eustress” (18). Yet, work is more commonly indicated as one of the most universal and intense kinds of `distress'. Distress is viewed in the “west” as a malady, needing treatment. Thus said, definitions and theories have evolved in the recent past with models explaining the aetiology of work related stress and

the subsequent negative psychological (anxiety and depression) and physical (heart disease and hypertension) effects.

The importance of understanding work stress and health as a problem for the GPs was yielded by Appleton (19) in a study among 406 GPs. There was found that 2/3 of the respondents had general symptoms of stress and 52% of respondents reported mental distress. The results of different studies showed that general practice is one of the most stressful workplace among health care workers (20-22) and has higher rates of job strain than in the reference population (8). Beside these significant findings, to understand the whole phenomenon, it is needed to take into account all characteristics, which can be specific to each occupation. In addition respondents can be influenced by quite similar working conditions and health status differently (7;23).

There are a number of studies showing that about half of the investigated GPs were not satisfied with their work (24-28) due to high job requirements. In recent literature important sources of psychosocial stress for GPs are mentioned: excessive paperwork, health reforms, bureaucratic interference (6), job demands, decision latitude, workplace location (29), job pressure, patient load (6;24;30;31), lack of organisational support (32-38), dealing with difficult patients (39;40) and objective personal characteristics such as age, gender and marital status (41-44).

Independence and flexibility, as provided by the continuing Lithuanian health care reform, with regard to the primary care services as a small business are now being undermined by high workload requirements to general practitioners due to new tasks, excessive paperwork and high patient load, which can lead to low job satisfaction and high psychosocial stress.

## **STUDY BACKGROUND**

### **Stress**

Stress may be contained within the body's normal homeostatic limits. Many symptoms of stress are uncomfortable and reduce the quality of life without causing irreversible damage to the individual. People vary in the length of time and magnitude of stress needed to cause ill health.

On the most general level, one can differentiate between four stress concepts:

1. The stimulus concept.
2. The response concept.
3. The transactional concept.
4. The discrepancy concept.

The stimulus concept focuses on situational conditions or events. Within this conceptualisation certain stimuli are stressful, for example high time pressure, interpersonal conflict at work, or accidents. However, the stimulus concept is problematic because not all individuals react in a uniform manner to the same stressor. Nearly every situational condition or every event may evoke strain in some individuals. In spite of the problems in stimulus conceptualisation, many researchers agree that there are subsets of stimuli which evoke strain in most individuals (45).

The response concept focuses on physiological reactions as the crucial constituent of stress, i.e. stress exists if an individual shows a specific reaction pattern, irrespective of situational characteristics (46). However, this conceptualisation also has its shortcomings. It does not take into account that very different situations can result in the same physiological responses, and that an individual's coping efforts may have an effect on this individual's reactions, thus altering the stress response.

The transactional concept - brought forward by Lazarus (47) - assumes that stress results from a transaction between the individual and the environment, including the individual's perceptions, expectations, interpretations, and coping responses. In terms of operationalisation and measuring stress in empirical studies this concept did not fully develop its potential yet. Often, proponents of the transactional concept actually rely in their research practice exclusively on verbal responses or physiological measures of strain as indicators of stress. By doing so, they implicitly apply the reaction concept.

The discrepancy concept describes stress as an incongruence between what the individual desires and the environment (48). However in operationalising such a discrepancy, researchers face great difficulties.

Recent models of stress have incorporated an understanding of the relationship between a person and his/her environment. The outcome of a stressor depends very much on whether the individual perceives the situation as stressful, (49) and whether he or she can cope with the situation. (50)

Work environment has been defined as the most important source of psychosocial stress. Cox defined work related stress as *a persons recognition of their inability to cope with demands relating to work, and in their subsequent experience of discomfort* (50). As with the broader area of stress, the concept includes an *external demand*, and an *internal perception* that the *response* to the demand is uncomfortable.

## **Stress at individual and organisational level**

The causation of work related stress can be investigated at the level of the individual or that of the organisation. Although it has been suspected that those with type A personalities are a greater risk of developing adverse stress responses, there seems a substantial doubt as to whether studies in the area have sufficiently addressed the variable perspectives of the stress process (22). Eliashof and Streltzer (51) have interviewed 26 patients in Hawaii with workers' compensation stress claims and found two distinct groups. Over half (56%) of their sample felt that their symptoms were precipitated by interpersonal conflict. A large proportion of this group had criteria satisfying a personality disorder, and was focused on issues related to the settlement of their claim. The smaller group that had suffered significant stress on the job, lacked personality disorders and were less likely to be pursuing compensation.

There have been many theories as to the base cause of the epidemic in work related stress. Van Onciul (52) believes that the reason lies in a disturbance in the balance between physical and mental activity, which has come about from a change in the work environment. She sees the modern workplace as being stressful and characterised by, *'lack of time, more uncontrollable factors... general uncertainty and more administrative work.'*

Peterson's substantial review found that detrimental work environments had social and psychological consequences for all workers; particularly those at lower levels (22). He has grouped the major influences as lack of control over workplace process or demands; the extent of decision making power, and issues related to role ambiguity, overwork and under-utilisation.

The organisational effects of downsizing were investigated in a recent longitudinal cohort study. Data were collected before, during and after a downsizing initiative that impacted on 1100 Finnish municipal workers. Measures included sick days, work characteristics, social relationships and health behaviours. The strongest effects on sickness absence were increases in physical demands, job insecurity and opportunities to participate in decision-making. (53-57)

### **Stress at work place and job strain**

A number of specific stressful working conditions, such as repetitive work, assembly-line work, electronic monitoring or surveillance, involuntary overtime, piece-rate work, inflexible hours, arbitrary supervision, and de-skilled work, have been studied (15;22;24;38;58-60). Stress is a broad term, which conveys a variety of meanings. A lot of models have been developed in this field to relate different elements of work environment to stress.

The issue of job strain is of utmost importance to the public health community and working people. In this essay “stress reactions” and the term “strains” has been used synonymously. The economic costs of stress caused by job strain in general (absenteeism, lost productivity) are difficult to estimate, but could be as high as several hundred-billions/per year (61). Most importantly, there is the potential for preventing much illness and death.

Work related stress is the result of a conflict between the role and needs of the individual employee and organisational, personal or other factors in their work place. There can also be an unacceptable tension between the demands of work and the

individuals' life outside work. Stress is also often typified by a lack of control over conditions at work. Since the “demand/control” model was introduced to characterise the psychosocial work environment (62-64), many empirical studies have tested the predictive validity of the model with respect to the physical and psychological health of the workers. Job strain—the combination of a psychologically demanding workplace and low job control—is hypothesised as leading to adverse health outcomes. Studies using both dimensions generally have provided better predictions than studies using either dimension alone. However, job control—the opportunity to use and develop skills and to exert authority over workplace decisions—emerged as the more robust component of a health-promoting work environment.

The effects of work related stress might result in a reduction in productivity in combination with a galaxy of emotional and/or physical symptoms. Mendelson (65) summarised the vast literature on work related stress and found that the adverse effects of stress at work vary depending on the degree and duration of stress; the type of occupation and individual personality traits.

### **Models for Job Strain Evaluation**

To analyse psychosocial work related stress there were created a lot of models and studies among physicians were done all over the world. The studies showed that work-related stress influences physicians' health, job satisfaction and takes turnover to patient's care and patient's satisfaction on quality of care (66-70).

Theories can be differentiated in models that describe the stress process itself and models that explain stress reactions, i.e. the relationship between stressors and strains. The first type of models describes what happens when an individual is exposed to a

stressor, while the second type of models specifies configurations of stressors that are associated with strains. Typically, this second type of models neglects process aspects. It can be distinguished between models focusing on the stress process and models on the relationship between stressful situations and strains (71).

### **Theoretical Models Focusing on the Stress Process.**

These models are aiming at a detailed description of what happens during the stress process. Major models in the area are the transactional stress model (47;72) and (other) cybernetic models (48).

*The Transactional Stress Model.* One of the most prominent models of the stress process is the transactional model by Lazarus (47;72). Lazarus and Folkman define psychological stress as “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being”. Thus, Lazarus and Folkman assume that cognitive appraisals play a crucial role in the stress process. Appraisal processes refer to an individual’s categorisation and evaluation of an encounter with respect to this individual’s well-being. Specifically, primary and secondary appraisal can be differentiated. By primary appraisal, encounters are categorised as irrelevant, benign-positive or stressful. Stress appraisals comprise harm/loss, threat, and challenge. By secondary appraisals, individuals evaluate what can be done in the face of the stressful encounter, i.e. they tax their coping options. On the basis of primary and secondary appraisals, individuals start their coping processes, which can stimulate reappraisal processes.

To arrive at a better understanding of the stress process and even how it develops over time, Lazarus (73) suggested putting more emphasis on an intra-individual analysis of the stress phenomenon, for example by studying the same persons in different contexts over time. A few studies followed such an approach (72). The majority of empirical studies in the area of organisational stress, however, did not adopt such a process perspective but treated stressful situations and individuals' reactions to them as stable. Moreover, it has been questioned whether a focus on individual processes offers enough to the understanding of workplace stress (45).

*Cybernetic Model.* Edwards (48) proposed a cybernetic model of organisational stress. Edwards summarised earlier approaches of stress, which implicitly assumed cybernetic principles (74;75) and explicitly built on Carver and Scheier's (76) work on cybernetics as a general theory of human behaviour. Crucial components in Carver and Scheier's model are an input function, a reference value, a comparator, and an output function. The input function refers to perceptions of one's own state or of situational features in the environment. The reference value comprises the individual's desires, values or goals. The comparator compares the input function with the reference value. The output function refers to the behaviour, which is activated when a discrepancy between the input function and the reference value is detected.

This model defines stress as “a discrepancy between an employee's perceived state and desired state, provided that the presence of this discrepancy is considered important by the employee” (48). Thus, stress occurs when the comparison between an individual's perception and his or her desire results in a discrepancy. The perception is assumed to be influenced by the physical and social environment, personal characteristics

of the individual, the individual's cognitive construction of reality, and social information. The discrepancy between perception and desires (i.e., stress) affects two outcomes: the individual's wellbeing and his or her coping efforts. Additionally, reciprocal effects between wellbeing and coping are assumed. Moreover, coping may have an effect on the person and the situation, the individual's desires, and the duration of the stressful situation as well as the importance attached to it. The effects of the discrepancy on well-being and coping efforts are moderated by additional factors such as the importance of the discrepancy and its duration.

Although there is empirical research on isolated aspects of the cybernetic model (48), to our knowledge, no study on organisational stress has yet examined the cybernetic framework as a whole. One reason is that it is difficult to examine the crucial assumptions of this model in one single study. Such a study must include separate measures of perceptions, desires, importance, duration, well-being, and coping. The greatest challenge will be to design non-confounded measures of individual perception, objective characteristics of the environment, of the individual's cognitive construction of reality, and social information processes.

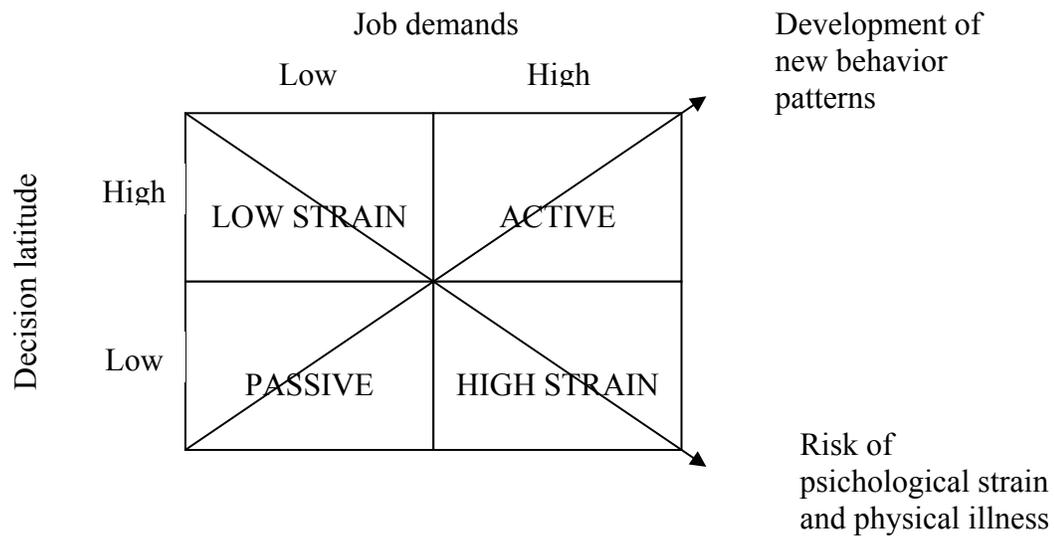
### **Theoretical Models on the Relationship between Stressful Situations and Strains.**

There are four major theoretical orientations toward organisational stress, namely: the Job Strain Model, The Occupational Stress Index (OSI) Model, Person-Environment Fit (PEF) Model and The Effort-Distress Model.

*Job Strain Model.* One of the most notable contributors to the field of occupational stress, Karasek (64), says that job stress occurs because the 'demands' of employment exceed the 'controls' of the individual needed to interact with those demands. Simply stated, if the demands placed on a person at work are higher than the perceptions of job demands, job strain will occur. In recent studies, this model has included a third factor: the beneficial effects of workplace social support.

The Job Strain Model (Figure 1) states that the combination of high job demands and low job decision latitude will lead to negative physical and psychological health outcomes. In addition, the model contains important predictions regarding the socialization of personality traits and behaviour patterns, which occurs at work. Chronic adaptation to low control-low demand situations ("passive" jobs in Figure 1) can result in reduced ability to solve problems or tackle challenges, and feelings of depression, or "learned helplessness" (77). Conversely, when high job demands are matched with greater authority and skill use (controllable stressors, or "active" jobs), more active learning and greater internal locus of control develops. This can enable individuals to develop a broader range of coping strategies. The discussion below on formulations of the "job strain" concept will primarily focus on studies of negative physical health outcomes, which have been more thoroughly reviewed.

**Fig 1.** Karasek’s Job Strain Model (78).



The Job Strain Model emphasizes the interaction between demands and control in causing stress, and objective constraints on action in the work environment. Karasek's model emphasizes another major negative consequence of work organization: showing how the principles of Taylorism, with its focus on reducing workers' skills and influence, can produce passivity, learned helplessness, and lack of participation (at work, in the community, and in politics). This model provides a justification and a public health foundation for efforts to achieve greater worker autonomy as well as increased workplace democracy (61).

*The Occupational Stress Index Model.* The OSI is an additive burden model, which focuses on work stressors (79). The OSI incorporates elements of the Job Strain Model (77), and derives more from cognitive ergonomics and brain research, attempting to describe, in quantitative terms, the burden of work processes upon the human being. The underlying motivation for developing such an approach is to help to pinpoint areas for intervention, by striving to reflect actual work experiences.

The OSI can be tailored to specific occupations, thus allowing comparison among occupations of the stress burden faced by workers” (80) We can make comparisons regarding the total burden, as well as in the nature of the occupational stress burden. These questions are of interest not only in the research setting, but are also those articulated by working people themselves.

*Person-Environment Fit Model.* The model incorporates: both perceived and objective stressors; the potential moderating effects of social support, personality factors, non-work factors, and demographic measures; feedback loops; and a wide variety of outcome measures. Issues of self-reported vs. objective job characteristics and effect modification are, of course, also important issues for the "job strain" model. However, the "job strain" model, in contrast to the PEF model, emphasises the need to distinguish features of the work environment that can be categorised as demands or control (and instead of a simple list of all job factors as potential stressors). The model also examines the interaction between demands and control, and emphasises the stress-producing properties of these objective factors, and not solely individual perceptions, or person-environment fit (78).

*The Effort-Distress Model.* Marianne Frankenhauser and her colleagues in Sweden have confirmed the involvement of two neuroendocrine systems in the stress response - the sympathoadrenal medullary system (which secretes the catecholamines, adrenalin and noradrenalin), and the pituitary-adrenal cortical system (which secretes corticosteroids such as cortisol) (78).

Building on the work of Henry and Stephens (81), Frankenhauser has shown that under demanding conditions where the organism can exert control, i.e., in the face of

controllable and predictable stressors (analogous to "active" work in the Karasek model), adrenalin levels increase, but cortisol decreases. Effort without distress is experienced. However, in demanding low control situations (analogous to Karasek's "high strain" jobs), where demands are perceived as excessive or threatening, both adrenalin and cortisol are elevated and effort with distress is experienced (78). In Frankenhauser's model, low demand-low control situations (analogous to Karasek's "passive" jobs or Seligman's concept of "learned helplessness") create feelings of depression and helplessness and elevated cortisol, although only mild elevations in catecholamines (78).

Personal control may exert a positive effect by reducing the duration of the stress response. Repetitive and machine-paced jobs, as well as excessive overtime, tend to prolong "unwinding", the return of neuroendocrine levels to baseline (78).

*Model selection.* A number of specific stressful working conditions, such as repetitive work, assembly-line work, electronic monitoring or surveillance, involuntary overtime, piece-rate work, inflexible hours, arbitrary supervision, and deskilled work, have been studied. Over the last 15 years, a new model of job stress developed by Robert Karasek has highlighted two key elements of these stressors, and has been supported by a growing body of evidence. Karasek's "job strain" model states that the greatest risk to physical and mental health from stress occurs to workers facing high psychological workload demands or pressures combined with low control or decision latitude in meeting those demands (63;64;82). While there are a variety of models of "job stress, the "job strain" model emphasizes the interaction between demands and decision latitude in causing stress, and it seems to be a more objective model to measure constraints on

action in the GPs work environment, rather than individual perceptions or person-environment fit.

In connection with the models it should be added that there have been two major approaches in occupational psychosocial research using self-reports. One has been to develop occupation-specific questions. This can provide rich, detailed information useful in identifying key areas for intervention. However, these job-specific questionnaires generally cannot measure job stressors across various occupations. The other approach has been to measure generic job characteristics using questions of a general nature. However, "this approach is less useful for intervention studies, because questions are more 'remote from actual work experiences'" (80).

### **Stress in general practice**

Factors making GPs more vulnerable to stress also can be analysed from individual and organisational perspective. At individual level in a recent literature as sources of psychosocial stress were mentioned age, gender and marital status. At organisational level as sources of psychosocial stress were shown work place location, type of practice, job demands, and decision latitude.

Two different studies, Wilhelmsson (8;17) and Buxrud (8;17;83), showed that the major source of GPs stress at work was high workload. Other studies showed that high level of job stress and/or low level of social support were associated with a high number of reported symptoms of psychological distress in GPs' practice. Low levels of problem solving and of emotional support from people at the workplace were also associated with a high number of reported symptoms (7;21;58;84-87).

The results also point to important gender differences. Compared with their male colleagues, the female GPs experienced higher job strain. Female GPs reported a high workload, low job control and low social support at work (7;8;21;58;84-88). Also studies showed that 12.8% of GPs had scores indicative of severe psychiatric disturbances. 53% of the respondents considered leaving their current workplace and 53% considered abandoning general practice as a basic cause of occupational stress (24).

The most frequently mentioned sources of job stress to GPs were increasing workload, paperwork, insufficient time to do justice to the job (6) and new models and conditions of work. But it is still unknown how health care reform and the new conditions may influence the level of stress among GPs in Lithuania and their relationship to work characteristics (89).

### **AIM**

To explore the psychosocial stress level among Lithuanian GPs and to examine the relationship between their psychosocial stress and work characteristics.

### **RESEARCH QUESTIONS**

1. What is the prevalence of psychosocial stress regarding the sociodemographic characteristics of GPs?
2. How do work demands and decision latitude influence the presence of psychosocial stress and the quality of life among GPs?
3. What characteristics can be predictors of psychosocial stress among GPs?

## **METHODS**

The GP's exposure to work related psychosocial stress can be assessed from self-report via a questionnaire, with the dimensions operationalised in the form of short, general instruments, highly reliably with the Karasek and Reeder scales.

*Target group:* Lithuanian GPs.

*Study design:* A cross-sectional study. A mailed survey of random national samples. Computerised randomisation was performed from the registry of Lithuanian physicians. The data collected through the questionnaires filled in by the GPs.

*Questionnaire.* The study involved the development and administration of a questionnaire for GPs. The questionnaire was designed using the Karasek, Reeder and Quality of Life scales. A questionnaire was pilot tested among a group of ten GPs and showed good reliability of the questionnaire to the research questions posed.

*Sample size.* Sample size was calculated using EpiInfo 2000 Statcalc software, which argued a sample size of 192 GPs with 95% confidence level. From the previous studies the expected response rate was 63%. Therefore, it was decided to send questionnaires to 300 Lithuanian GPs. The observed response rate was 66%. 197 filled-in questionnaires were collected.

*Assessment of Psychosocial Stress.* Psychosocial stress in this study was investigated by a questionnaire based on the Reeder scale(90-92). The Reeder scale uses four statements experienced in everyday stressful situations as "usually tense or nervous", "daily activities are extremely trying and stressful". The respondents should indicate whether each of the statements describes them. Each question has four alternative

responses, which were coded using Likert-like scale. A simple summation method was used for scoring(93).

*Assessment of work characteristics.* Work characteristics were investigated with the Karasek scale (62-64;82). It is based on the model, also known as the "job strain" model (fig. 1).

The Lithuanian version of Karasek's scale of 11 questions was adopted by prof. A. Goštautas in 1992. This scale measures job character — decision latitude and psychological workload demands (Table 1).

The first scale - decisions latitude scale is composed of two subscales: skill discretion and decision making authority available to the worker.

Skill discretion, measured by six items such as “keep learning new things”, “can develop skills”, “job requires skills”, “task variety”, “repetitious”, and “job requires creativity”, and decision authority, measured by three items, such as “have freedom to make decisions”, “choose how to perform work”, and “have a lot of say on the job”.

The second scale is psychological job demands, defined by five items such as “excessive work”, “conflicting demands”, “insufficient time to work”, “work fast”, and “work hard”.

A four point Likert - like scale was used with the coding from 4 to 1 for series, so that the responses were summarised to give a score (94).

**Table 1.** Basic components of R. Karasek Job Strain Model

<b>Component</b>	<b>Demand</b>
Decision latitude	<ul style="list-style-type: none"> <li>Skills discretion</li> <li>Job requires learning new things</li> <li>Job requires high level of skills</li> <li>Job requires creativity</li> <li>Job entails a variety of things to do</li> </ul>
Decision authority	<ul style="list-style-type: none"> <li>Job allows making one's own decision</li> <li>Job provides a lot of freedom as to how the work gets done</li> </ul>
Job demands	<ul style="list-style-type: none"> <li>Job requires very hard work</li> <li>Job requires very fast work</li> <li>Job requires excessive work</li> <li>Job involves conflicting demands</li> <li>Job involves not having enough time to get the job done</li> </ul>

*Data* were also collected on supplementary aspects of stress and work characteristics, including: practice characteristics (partnership size, workplace location, patient load); and personal characteristics (gender, age and marital status).

*Statistical analysis.* The data were computed - coded and analysed, using Statistical Package for the Social Sciences for Windows version 11.0 (SPSS Inc). The analysis included descriptive statistics, interrelation analysis and multivariate logistic regression as useful tool to predict the presence or absence of a characteristic or outcome

based on values of a set of predictor variables. Logistic regression coefficients were used to estimate the odd ratios for each of the independent variables in the model.

Nonparametric tests were used to test for significant differences at the  $p = 0.05$  level.

### **ETHICAL CONSIDERATIONS**

The purpose of the present mailed questionnaire study has been to discover relationships between psychosocial stress and work characteristics in general practice. All respondents of this study were under informed consent and received written information about the purpose of the study as well as the confidentiality taken by the researchers. Local Ethical Committee has approved the research plan. Participation was voluntary. Participants were informed about their possibility not to answer some of the questions or the whole questionnaire. No names were used during the coding, the data analysis and in the reports. All gathered information is confidential and no individual information is given to the authorities.

### **RESULTS**

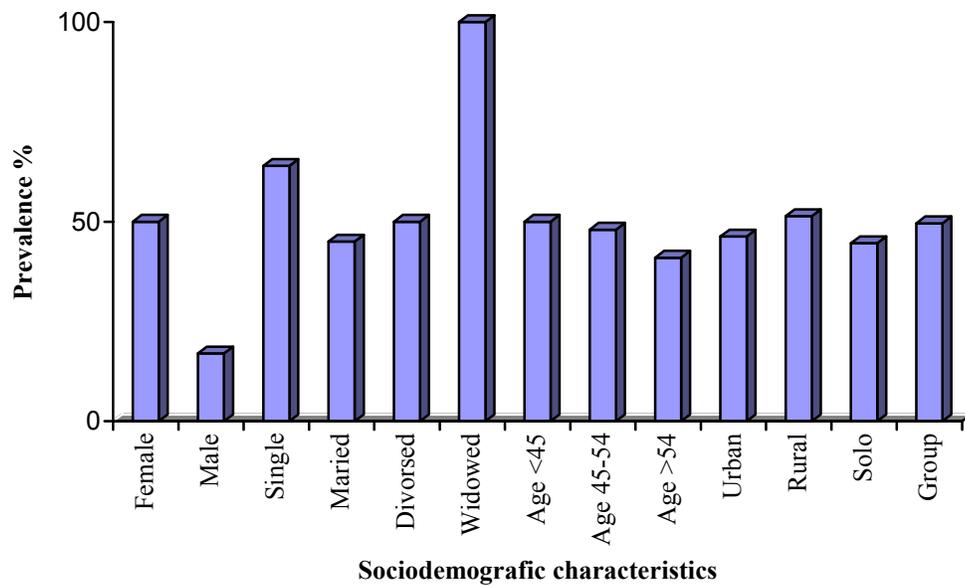
Of the 197 respondents, 162 (82.2%) GPs were female, and 35 (17.8%) male. The GPs' ages ranged from 31 to 66 years (mean 44.2 years, 95% CI 42.9 – 45.4). This reflects to the whole GP population in Lithuania. Significant gender difference was found for mean age (males 47.1 years, 95% CI 43.5 – 50.7; females 43.5 years, 95% CI 42.2 – 44.9;  $p < 0.03$ ). All descriptive measures are shown in Table 2.

**Table 2.** Characteristics of general practitioners who responded to a questionnaire survey on stress in general practice (N=197).

<b>Variables</b>	<b>Number</b>	<b>%</b>
Gender		
Male	35	17.8
Female	162	82.2
Age (years)		
less 45	90	45.7
45-54	85	43.1
more 54	22	11.2
Years worked as a GP		
less 8	40	20.3
8- 28	115	58.4
more 28	42	21.3
Marital status		
Single	22	11.2
Married	150	76.1
Divorced	22	11.2
Widowed	3	1.5
Practice ownership type		
Solo practice	56	28.4
Group practice	141	71.6
Workplace		
City	123	62.4
Rural	74	37.6
Patient load (patient/day)		
less 18	21	10.7
18-28	140	71.1
more 28	36	18.3

### Prevalence of psychosocial stress among GPs by sociodemographic characteristics

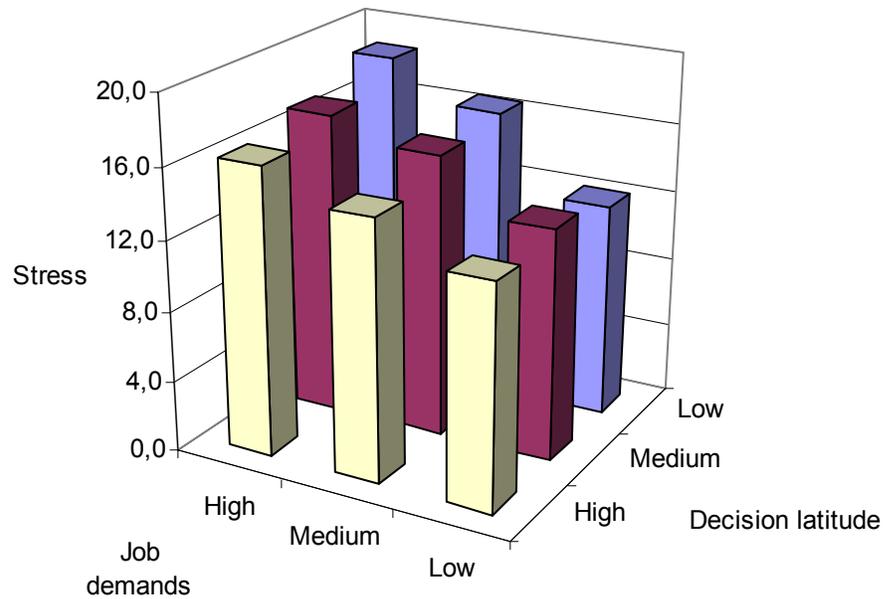
Forty-eight per cent of respondents could be classified as suffering from work related psychosocial stress by the Reeder scale. Figure 2 shows that there are considerable variations in job strain measures regarding to sociodemographic characteristics of the GPs. The highest percentage of psychosocial stress by sociodemographic characteristics was found among widowed, single and female GPs.



**Figure 2.** Prevalence of psychosocial stress among GPs by sociodemographic characteristics

### Work demands, decision latitude and presence of psychosocial stress among GPs

The job strain model suggests that high job demands, and low job control, are indicators of job strain.



**Figure 3.** Interrelationship between job demands, decision latitude and psychosocial stress  
( $\chi^2 = 18,9$ ;  $p < 0,01$ )

Figure 3 shows a statistically significant interrelationship between job demands, decision latitude and psychosocial stress. Our results confirmed the Job strain model's hypothesis and highlighted that job strain occurs when job demands are high and job decision latitude is low.

## Predictors of psychosocial stress among GPs

Table 3. Multivariate logistic regression model to predict psychosocial stress among Lithuanian GPs (n=197)

Variables	B	P-value	OR	95,0% CI for OR
Constant	-4.782	<0,001		
Female gender (male – reference)	0,465	0,337	1,593	0,616-4,117
Rural workplace (city - reference)	0,261	0,478	1,298	0,632-2,665
Solo practice (group – reference)	0,342	0,373	1,408	0,664-2,987
Age less 45 (reference to age group 45-54)	1,928	0,024	6,874	1,292-36,582
Age more 54 (reference to age group 45-54)	0,010	0,980	1,010	0,459-2,226
Practice duration 8- 28 (more 28 – reference)	1,770	0,015	5,873	1,407-24,523
Practice duration less 8 (more 28 – reference)	1,627	0,054	5,089	0,975-26,552
Patient load 18-28 p/d (less 18 p/d –reference)	1,769	0,009	5,863	1,549-22,188
Patient load > 28 p/d (less 18 p/d –reference)	1,845	0,014	6,330	1,450-27,630
Low ability to use skills	0,198	0,609	1,219	0,571-2,600
Low decision latitude	0,317	0,343	1,373	0,713-2,644
High job demands	1,418	<0,001	4,128	2,102-8,104

The multivariate analysis shows that gender, work place location, practice ownership type, low ability to use skills and low decision latitude did not exhibit a statistically significant effect on job strain and did not have a significant effect even when no other variables were controlled for. The model highlighted high job demands, patient load more than 18 patients per day and young age of GPs as significant predictors for job strain.

## **DISCUSSION**

GPs are the physicians at the forefront of helping patients to manage urgent health problems. In the current social and political climate Lithuanian GPs face many stressors that are peculiar to the medical profession. As a consequence of the health care reform, GPs are required to have more competence than before in diagnosis and ongoing management of medical conditions. This means increased responsibilities, which may contribute to higher psychosocial stress for Lithuanian GPs. GPs as gatekeepers have to make decisions on patient's health, also whether to send them to hospitals. Sometimes it can interfere with their personal life that can cause negative feelings about work, frustration, tension and lack of time to make appropriate decisions (67).

This study has highlighted that forty-eight per cent of the respondents could be classified as suffering from work related psychosocial stress by the Reeder scale. The highest job strain prevalence was among widowed, single and female GPs. The lowest job strain prevalence was among males and GPs of older age. The greatest risk to physical and mental health from stress occurs to GPs facing high psychological workload demands combined with low decision latitude in meeting those demands. High job demands, patient load more than 18 patients per day and young age of GPs can predict a statistically significant effect on job strain. Gender, work place location, practice ownership type, low ability to use skills and low decision latitude does not exhibit for GPs in Lithuania a statistically significant effect on job strain development.

To evaluate the results of the present study correctly, some weaknesses of the study design have to be mentioned. The most important one is its cross-sectional nature, which precludes an evaluation of temporal precedence and causality of the observed

associations. Karasek's Job Strain Model guided the hypotheses about causal relationships between job strain and other work characteristics. The explored causal relations should be interpreted carefully and longitudinal studies should be carried out in the future research.

Another limitation is Karasek's questionnaire itself. It was designed to be broadly applicable to a wide range of occupations. However, this generalisability inevitably means that factors that are specific to particular occupations may be overlooked. For example, job demands as it has been conceptualised and operationalised in this survey would not take into account some emotional demands that could be source of stress to GPs such as dealing with difficult patients or caring for the dying patients (21;38).

The third limitation is the exclusive reliance on self-reported rating scales, which raises the issue of systematic positive or negative response tendencies. Furthermore, as no scale is perfectly reliable, the associations between self-reported measures and self-reported workload appear to be weaker than they could be in reality. Several authors have argued, though, that this phenomenon is not a major threat if interactions has been found (33;95).

Otherwise, on the positive side, it is important to mention that generalisability of Karasek's model allows us to make comparisons among different medical and non-medical occupational groups and this has been an important factor in selecting the job strain model. Our results were obtained among a sample of people working in general practice. As strength of the investigation can be seen similar education level that respondents had. The sample size was sufficient regarding to sample size calculation and to allow exploration of tendencies. The participation rate was acceptable, and the scales

used were previously validated instruments (90) that retained their psychometric properties in our population. Findings from this research have hopefully emphasized the importance of examining changes and associations between work characteristics and job strain among GPs before health care reform in Lithuania will be definitely implemented.

## REFERENCES

- (1) European observatory on health care systems. Health care systems in transition. Lithuania. Copenhagen: World health organization, 2000.
- (2) Vanagas G, Bihari-Axelsson S. Cross-sectional study on quality of life, work demands and psychosocial stress of Lithuanian general practitioners. *Eur J Gen Pract* 2004; 10(4):179-80.
- (3) Dowell AC, Westcott T, McLeod DK, Hamilton S. A survey of job satisfaction, sources of stress and psychological symptoms among New Zealand health professionals. *N Z Med J* 2001; 114(1145):540-543.
- (4) Firth-Cozens J. Individual and organizational predictors of depression in general practitioners. *Br J Gen Pract* 1998; 48(435):1647-51.
- (5) Iversen L, Farmer JC, Hannaford PC. Workload pressures in rural general practice: a qualitative investigation. *Scand J Prim Health Care* 2002; 20(3):139-144.
- (6) Simoens S, Scott A, Sibbald B. Job satisfaction, work-related stress and intentions to quit of Scottish GPs. *Scott Med J* 2002; 47(4):80-86.
- (7) Sundquist J., Johansson SE. High demand, low control, and impaired general health: working conditions in a sample of Swedish general practitioners. *Scand J Public Health* 2000; 28(2):123-31.
- (8) Wilhelmsson S, Foldevi M, Akerlind I, Faresjo T. Unfavourable working conditions for female GPs. A comparison between Swedish general practitioners and district nurses. *Scand J Prim Health Care* 2002; 20(2):74-78.
- (9) Williams ES, Konrad TR, Linzer M, McMurray J, Pathman DE, Gerrity M et al. Physician, practice, and patient characteristics related to primary care physician physical and mental health: results from the Physician Worklife Study. *Health Serv Res* 2002; 37(1):121-143.
- (10) Sibbald B, Bojke C, Gravelle H. National survey of job satisfaction and retirement intentions among general practitioners in England. *BMJ* 2003; 326(7379):22.
- (11) Vanagas G, Bihari-Axelsson S. Interaction among general practitioners age and patient load in the prediction of job strain, decision latitude and perception of job demands. A Cross-sectional study. *BMC Public Health* 2004; 4(1):59.
- (12) Norman P, Fitter M, Wall T. General practitioners' subjective experience of surgery workload. *Soc Sci Med* 1991; 33(2):161-166.

- (13) Peters B. Primary care: new demands for a new era. *Mich Health Hosp* 1995; 31(4):18-20.
- (14) Schieman S, Van Gundy K, Taylor J. Status, role, and resource explanations for age patterns in psychological distress. *J Health Soc Behav* 2001; 42(1):80-96.
- (15) Shanley BC, Schulte KM, Chant D, Jasper A, Wellard R. Factors influencing career development of Australian general practitioners. *Aust Fam Physician* 2002; 31(1):49-54.
- (16) Sturmberg JP. Remuneration systems and GPs: can we adapt to future demands? *Aust Fam Physician* 1999; 28(7):650.
- (17) Wilhemsson S, Faresjo T, Foldevi M, Akerlind I. The personal doctor reform in Sweden: perceived changes in working conditions. *Fam Pract* 1998; 15(3):192-197.
- (18) Mesler R. *Eustress Health and healing at the individual level*. United States International University, San Diego, California., 1994.
- (19) Appleton K, House A, Dowell A. A survey of job satisfaction, sources of stress and psychological symptoms among general practitioners in Leeds. *Br J Gen Pract* 1998; 48(428):1059-1063.
- (20) Buxrud EG. [Community health services--more stressing for female than male physicians?]. *Tidsskr Nor Laegeforen* 1990; 110(25):3260-3264.
- (21) Calnan M, Wainwright D, Forsythe M, Wall B, Almond S. Mental health and stress in the workplace: the case of general practice in the UK. *Soc Sci Med* 2001; 52(4):499-507.
- (22) Peterson CL. Work factors and stress: a critical review. *Int J Health Serv* 1994; 24(3):495-519.
- (23) Metcalfe C., Smith GD, Wadsworth E, Sterne JA, Heslop P, Macleod J et al. A contemporary validation of the Reeder Stress Inventory. *Br J Health Psychol* 2003; 8(Pt 1):83-94.
- (24) Schattner PL, Coman GJ. The stress of metropolitan general practice. *Med J Aust* 1998; 169(3):133-137.
- (25) Chambers R, Wall D, Campbell I. Stresses, coping mechanisms and job satisfaction in general practitioner registrars. *Br J Gen Pract* 1996; 46(407):343-348.
- (26) Cooper CL, Rout U, Faragher B. Mental health, job satisfaction, and job stress among general practitioners. *BMJ* 1989; 298(6670):366-370.

- (27) Gosden T, Williams J, Petchey R, Leese B, Sibbald B. Salaried contracts in UK general practice: a study of job satisfaction and stress. *J Health Serv Res Policy* 2002; 7(1):26-33.
- (28) Jacobs S. Addressing the problems associated with general practitioners' workload in nursing and residential homes: findings from a qualitative study. *Br J Gen Pract* 2003; 53(487):113-119.
- (29) Sexton R. Maintaining the wellbeing of rural GPs. *BMJ* 2003; 326(7391):s101.
- (30) Scott A, Vale L. Increased general practice workload due to a primary care led National Health Service: the need for evidence to support rhetoric. *Br J Gen Pract* 1998; 48(428):1085-1088.
- (31) Charles-Jones H, Houliker M. Out-of-hours work: the effect of setting up a general practitioner cooperative on GPs and their families. *Br J Gen Pract* 1999; 49(440):215-216.
- (32) Branthwaite A, Ross A. Satisfaction and job stress in general practice. *Fam Pract* 1988; 5(2):83-93.
- (33) de Jonge J, Mulder MJ, Nijhuis FJ. The incorporation of different demand concepts in the job demand-control model: effects on health care professionals. *Soc Sci Med* 1999; 48(9):1149-60.
- (34) Young G, Spencer J. General practitioners' views about the need for a stress support service. *Fam Pract* 1996; 13(6):517-521.
- (35) May HJ, Revicki DA, Jones JG. Professional stress and the practicing family physician. *South Med J* 1983; 76(10):1273-6.
- (36) Mazie B. Job stress, psychological health, and social support of family practice residents. *J Med Educ* 1985; 60(12):935-41.
- (37) Rout U. Stress among general practitioners and their spouses: a qualitative study. *Br J Gen Pract* 1996; 46(404):157-160.
- (38) Sutherland VJ, Cooper CL. Identifying distress among general practitioners: predictors of psychological ill-health and job dissatisfaction. *Soc Sci Med* 1993; 37(5):575-581.
- (39) Calnan M., Wainwright D, Forsythe M, Wall B. General practice. All stressed up and nowhere to go? *Health Serv J* 2000; 110(5709):28-9.
- (40) McGlone SJ, Chenoweth IG. Job demands and control as predictors of occupational satisfaction in general practice. *Med J Aust* 2001; 175(2):88-91.

- (41) Barnes-Farrell JL., Rumery SM, Swody CA. How do concepts of age relate to work and off-the-job stresses and strains? A field study of health care workers in five nations. *Exp Aging Res* 2002; 28(1):87-98.
- (42) Chambers R, Campbell I, I. Anxiety and depression in general practitioners: associations with type of practice, fundholding, gender and other personal characteristics. *Fam Pract* 1996; 13(2):170-173.
- (43) Estry-Behar M, Kaminski M, Peigne E, Bonnet N, Vaichere E, Gozlan C et al. Stress at work and mental health status among female hospital workers. *Br J Ind Med* 1990; 47(1):20-28.
- (44) Preston DB. Marital status, gender roles, stress, and health in the elderly. *Health Care Women Int* 1995; 16(2):149-65.
- (45) Brief AP, George JM. Psychological stress and the workplace: A brief comment on Lazarus' outlook. In: Crandall R., Perrewé P.L., editors. *Occupational stress. A handbook*. Washington: Taylor & Francis., 1995: 15-19.
- (46) Selye in Posen DB. Stress management for patient and physician. *Can J CME* 1995; 29:215-221.
- (47) Lazarus RS. *Psychological stress and the coping process*. New York: Springer., 1966.
- (48) Edwards JR. A cybernetic theory of stress, coping, and well-being in organizations. *Academy of Management Review* 1992; 17:238-74.
- (49) Williamson AM. Managing stress in the workplace : Part II - The scientific basis (knowledge base) for the guide. *International Journal of Industrial Ergonomics* 1994; 14:171-96.
- (50) Cox T, Kent G, Dalgleish M. *Psychology and Medical Care*. Berkshire: Van Nostrand Reinhold (UK) Co Ltd, 1983.
- (51) Eliashof BA, Streltzer J. The role of stress in workers' compensation stress claims. *J Occup Med* 1992; 34(2):297-303.
- (52) Von Onciul J. ABC of work related disorders: Stress at work. *BMJ* 1996; 313:745-748.
- (53) Elovainio M, Kivimaki M. Work and strain on physicians in Finland. *Scand J Soc Med* 1998; 26(1):26-33.
- (54) Elovainio M, Kivimaki M, Steen N, Kalliomaki-Levanto T. Organizational and individual factors affecting mental health and job satisfaction: a multilevel analysis of job control and personality. *J Occup Health Psychol* 2000; 5(2):269-277.

- (55) Kivimaki M, Vahtera J, Thomson L, Griffiths A, Cox T, Pentti J. Psychosocial factors predicting employee sickness absence during economic decline. *J Appl Psychol* 1997; 82(6):858-872.
- (56) Kivimaki M, Vahtera J, Pentti J, Ferrie JE. Factors underlying the effect of organisational downsizing on health of employees: longitudinal cohort study. *BMJ* 2000; 320(7240):971-975.
- (57) Piirainen H, Rasanen K, Kivimaki M. Organizational climate, perceived work-related symptoms and sickness absence: a population-based survey. *J Occup Environ Med* 2003; 45(2):175-184.
- (58) Mesler R., Capobianco M. Psychosocial factors associated with job stress. *Stress News* 2001; 13(4).
- (59) Niedhammer I, Chea M. Psychosocial factors at work and self reported health: comparative results of cross sectional and prospective analyses of the French GAZEL cohort. *Occup Environ Med* 2003; 60(7):509-515.
- (60) Salminen S., Kivimaki M, Elovainio M, Vahtera J. Stress factors predicting injuries of hospital personnel. *Am J Ind Med* 2003; 44(1):32-36.
- (61) Karasek RA, Theorell T. *Healthy Work*. New York: Basic Books, 1990.
- (62) Karasek R., Theorell G. *Job, psychological factors and coronary heart disease. Psychological problems before and after myocardial infarction*. Switzerland: S. Kargan, 1982.
- (63) Karasek R. *Control in the workplace and its health-related aspects, Job control and worker health*. Chichester: John Wiley & Sons Ltd., 1989.
- (64) Karasek R. Health risk with increased job control among white-collar workers. *J Org Behav* 1990; 11(3):171-85.
- (65) Mendelson G. Occupational stress part 2 : occupations at risk. *Journal Occupational Health and Safety - Australia and New Zealand* 1990; 6(3):181-8.
- (66) French DP, McKinley RK, Hastings A. GP stress and patient dissatisfaction with nights on call: an exploratory study. *GP stress and patient satisfaction. Scand J Prim Health Care* 2001; 19(3):170-173.
- (67) Grol R, Mookink H, Smits A, Van Eijk J, Beek M, Mesker P et al. Work satisfaction of general practitioners and the quality of patient care. *Fam Pract* 1985; 2(3):128-135.
- (68) Huby G, Gerry M, McKinstry B, Porter M, Shaw J, Wrate R. Morale among general practitioners: qualitative study exploring relations between partnership arrangements, personal style, and workload. *BMJ* 2002; 325(7356):140.

- (69) Kersnik J., Svab I., Vegnuti M. Frequent attenders in general practice: quality of life, patient satisfaction, use of medical services and GP characteristics. *Scand J Prim Health Care* 2001; 19(3):174-7.
- (70) Morgan M, McKeivitt C, Hudson M. GPs' employment of locum doctors and satisfaction with their service. *Fam Pract* 2000; 17(1):53-55.
- (71) Cooper CL. *Theories of organizational stress*. New York: Oxford University Press., 1998.
- (72) Lazarus RS, Folkman S. *Stress, appraisal, and coping*. New York: Springer., 1984.
- (73) Lazarus RS. Psychological stress in the workplace. *J UOEH* 1989; 11 Suppl:528-540.
- (74) Kahn RL, Wolfe DM, Quinn RP, Snoek JD, Rosenthal RA. *Organizational stress: Studies in role conflict and ambiguity*. New York: Wiley, 1964.
- (75) McGrath I, DeCarteret JC. Occupational stress claims - effects on workers' compensation. *AAOHN* 1994; 42(10):494-99.
- (76) Carver CS, Scheier MF. Control theory: A useful conceptual framework for personalitysocial, clinical, and health psychology. *Psychological Bulletin* 1982; 92:111-35.
- (77) Karasek RA. Job demands, job decision latitude and mental strain: Implications for job redesign. *Adm Sci Q* 1979; 25:285-307.
- (78) Schnall PL, Landsbergis PA, Baker D. Job strain and cardiovascular disease. *Annu Rev Public Health* 1994; 15:381-411.
- (79) Belkic K, Savic C, Theorell T, Rakic L, Ercegovac D, Djordjevic M. Mechanisms of cardiac risk among professional drivers. *Scand J Work Environ Health* 1994; 20(2):73-86.
- (80) Landsbergis PA, Theorell T. Measurement of psychosocial workplace exposure variables: Self-report questionnaires. In: Schnall PL, Belkic K, Landsbergis PA, Baker D, editors. *Occupational Medicine: State of the Art Review. The Workplace and Cardiovascular Disease*. Oxford: Oxford University Press, 2000: 163-171.
- (81) Henry JP, Stephens PM, Axelrod J, Mueller RA. Effect of psychosocial stimulation on the enzymes involved in the biosynthesis and metabolism of noradrenaline and adrenaline. *Psychosom Med* 1971; 33(3):227-237.

- (82) Landsbergis P.A., Schnall P.L., Schwartz JE, Warren K, Pickering TG. The patterning of psychological attributes and distress by "Job strain" and social support in sample of working men. *J Behav Med* 1992; 15:128-133.
- (83) Buxrud EG. Community health services--more stressing for female than male physicians? *Tidsskr Nor Laegeforen* 1990; 110(25):3260-3264.
- (84) Eakin J.M., MacEachen E. Health and the social relations of work: a study of the health-related experiences of employees in small workplaces. *Sociology of Health & Illness* 1998; 20(6):896-914.
- (85) Newbury-Birch D., Kamali F. Psychological stress, anxiety, depression, job satisfaction, and personality characteristics in preregistration house officers. *Postgrad Med J* 2001; 77:109-11.
- (86) Chambers R, George V, McNeill A, Campbell I. Health at work in the general practice. *Br J Gen Pract* 1998; 48(433):1501-1504.
- (87) Dowell AC, Hamilton S, McLeod DK. Job satisfaction, psychological morbidity and job stress among New Zealand general practitioners. *N Z Med J* 2000; 113(1113):269-272.
- (88) Buxrud EG. [Experiences of physicians and nurses with the occupational environment in health centers in Oslo--how do they have it and how do they take it]. *Tidsskr Nor Laegeforen* 1991; 111(15):1869-1873.
- (89) Vanagas G, Bihari-Axelsson S., Vanagiene V. Do age, gender and marital status influence job strain development for general practitioner? *Medicina (Kaunas)* 2004; 40(11):1021-1027.
- (90) Gostautas A. Psychological aspects of occupational stress. *Sveikata* 1991; 6:55-58.
- (91) Metcalfe C, Smith GD, Wadsworth E, Sterne JA, Heslop P, Macleod J et al. A contemporary validation of the Reeder Stress Inventory. *Br J Health Psychol* 2003; 8(Pt 1):83-94.
- (92) Schar M, Reeder LG, Dirken JM. Stress and cardiovascular health: An international cooperative study- II. The male population of a factory at Zurich. *Soc Sci Med* 1973; 7:585-603.
- (93) Heslop P., Davey Smith G, Carroll D, Macleod J, Hyland F, Hart C. Perceived stress and coronary heart disease risk factors: The contribution of socioeconomic position. *J Health Psychol* 2001; 6:167-78.
- (94) Bosma H, Marmot MG, Hemingway H, Nicholson AC, Brunner E, Stansfeld SA. Low job control and risk of coronary heart disease in whitehall ii (prospective cohort) study. *BMJ* 1997; 314(7080):558.

- (95) Dollard MF, Winefield AH. A test of the demand-control/support model of work stress in correctional officers. *J Occup Health Psychol* 1998; 3(3):243-264.

## APPENDIX 1. Study questionnaire.



### NORDIC SCHOOL OF PUBLIC HEALTH

In association with Kaunas University of Medicine and Collegium of General Practitioners of Lithuania

## WORK RELATED STRESS QUESTIONNAIRE

### Instructions

This assessment asks about your job related stressful situations and work characteristics. Please, try to answer all the questions. If you are not sure about which response to give to a question, please, choose the one that appears as the most appropriate. This can often be your first response. We also inform you that you have the possibility not to answer a question or questions.

Please keep in mind your standards, concerns and feelings of your daily work activities.

### Questions

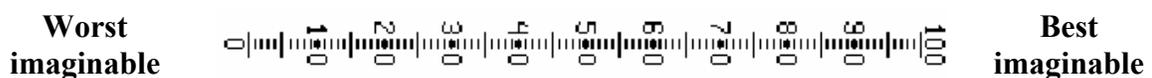
- |                         |                      |                          |             |                          |
|-------------------------|----------------------|--------------------------|-------------|--------------------------|
| Gender                  | Female               | <input type="checkbox"/> | Male        | <input type="checkbox"/> |
| Work place location     | City                 | <input type="checkbox"/> | Countryside | <input type="checkbox"/> |
| GP practice             | Solo                 | <input type="checkbox"/> | Group       | <input type="checkbox"/> |
| Age                     | <input type="text"/> | Years                    |             |                          |
| Duration of GP practice | <input type="text"/> | Years                    |             |                          |
| Family status           | Single               | <input type="checkbox"/> | Married     | <input type="checkbox"/> |
|                         | Divorced             | <input type="checkbox"/> | Widower     | <input type="checkbox"/> |

Please go to the next page

	<b>Exactly</b>	<b>To some extent</b>	<b>Not very accurately</b>	<b>Not at all</b>
In general I am usually tense or nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I'm always sweating when I think about my job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There is a great amount of nervous strain connected with my daily activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My daily activities are extremely trying and stressful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I'm extremely stressful in communicating with other peoples	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
At the end of the day I am completely exhausted mentally and physically	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<b>Often</b>	<b>Sometimes</b>	<b>Seldom</b>	<b>Never</b>
I get to do a variety of different things on my job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My job requires a high level of skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My job requires that I learn new things	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My job requires from me to be creative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My job allows me to make a lot of decisions on my own	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
On my job, I have very little freedom to decide how I do my work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have enough time to get the job done	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am not asked to do an excessive amount of work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My job requires working very fast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am free from conflicting demands that others make	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My job requires working very hard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Our work activity is a part of our daily living and has great influence to our quality of life. We would like to ask you visually **mark at any point of the scale** that would reflect best your **recent quality of life**.



**END**

THANK YOU FOR ANSWERS

**APPENDIX 2. Permission for the Karasek Questionnaire use.**

### **APPENDIX 3. Published papers on Lithuanian GPs study.**

1. Vanagas G, Bihari-Axelsson S. Interaction among general practitioners age and patient load in the prediction of job strain, decision latitude and perception of job demands. A Cross-sectional study. *BMC Public Health* 2004; 4(1):59.
2. Vanagas G, Bihari-Axelsson S, Vanagiene V. Do age, gender and marital status influence job strain development for general practitioner? *Medicina (Kaunas)* 2004; 40(10):1014-1018.
3. Vanagas G, Bihari-Axelsson S. Cross-Sectional Study on Quality of Life, Work Demands and Psychosocial Stress of Lithuanian General Practitioners. *Eur J Gen Pract* 2004; 10(4):169-170.
4. Vanagas G, Bihari-Axelsson S. Do gender differences have influence on psychosocial stress, quality of life and work demands? Cross sectional study. *Eur J Gen Med* 2004; 1(4):36-41.

