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Work in Care for the Elderly

Combining theories of job design, stress, information processing and
organizational cultures

by

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Academic Dissertation

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Timo Sinervo

List of original articles

This thesis is based on six original articles.

- I Sinervo, T. & Elovainio, M. 1998. Työ ja hyvinvointi vanhuspalveluissa. (Work and well-being of workers in the care for the elderly). *Gerontologia*, 12(1), 3–13.
- II Elovainio, M. & Sinervo, T. 1996. Työn piirteiden suhde työn koettuihin rasitustekijöihin vanhustenhuollon työntekijöillä. (Job characteristics and stressors of workers in the care for the elderly). *Sosiaalilääketieteellinen Aikakauslehti*, 33, 257–264.
- III Elovainio, M. & Sinervo, T. 1997. Psychosocial stressors at work, psychological stress and musculoskeletal symptoms in the care for the elderly. *Work & Stress*, 11(4), 351–361.
- IV Sinervo, T. & Elovainio, M. 2000. Functional abilities of patients and workers' stress in care for the elderly. (Submitted).
- V Sinervo, T. 1996. Vanhainkotien henkilöstön vanhuskäsitys ja työn tavoitteet asiantuntijuuden ja organisaatiokulttuurin näkökulmasta. (Elderly care workers' knowledge concerning elderly people and goals at work in the point of view of expertise and organizational cultures). *Kasvatus*, 27(2), 176–185.
- VI Sinervo, T. 1997. Sosiaali- ja terveysalan muuttuvat kulttuurit. (The changing cultures in the social services and health care). In L. Simonen, M. Elovainio & H. Valtonen (eds.) *Sosiaalitutkimuksen valossa. (In the light of social research)*. Helsinki, Stakes. (pp. 189–202).

Contents

Acknowledgements
List of original articles

1 Introduction	1
2 Theoretical background	3
Job design and job characteristics	4
Theoretical background of job design	4
Job characteristics model	5
Do job characteristics produce supposed outcomes	7
Satisfaction and motivation	7
Performance	9
Turnover	10
Objectivity of the measurement instrument of Job Characteristics theory	10
Reliability of the measurement of job characteristics	11
Cognitive theories of job design	12
Stress theories	13
Stressors	15
Control	16
Stress reactions	19
Psychological outcomes	19
Physical outcomes	20
Musculoskeletal disease and stress	20
Behavioral outcomes	22
Relationships between stress and job satisfaction	23
Differences in stress reaction	25
Knowledge, goals and cultures guiding the work	27
Social cognitions	28
Goals	29
Information processing, work organization and culture	30
Cultural diversity	31
Relevance of culture and information processing in stress research and job design	32
Work in health care and social services	34
Stressors and job demands in care for the elderly	36
Gaps in previous research	38
The aim of the research	40

3 Methods	43
Samples	43
Measures	44
Statistical analyses	48
Qualitative analysis	49
4 Results	51
Work in care for the elderly	51
Stressors and factors explaining strain and job satisfaction	54
Job characteristics and stressors	55
Stress and musculoskeletal symptoms	56
Functional abilities of patients and workers' stress	58
Shared or conflicting understanding of work	60
Summary of results	63
5 Discussion	65
Theoretical considerations	65
Stress and job satisfaction	65
Psychosocial factors and musculoskeletal symptoms	67
Patients' functioning as shaping the work environment	68
Knowledge structures concerning old people	69
Work in institutions	70
Limitations of the research	73
Challenges for future research	73
Recommendations for development of services in care for the elderly	75
Summary	77
Summary in Finnish	81
References	85
Original articles I - VI	

1 Introduction

In Finland care for the elderly continues to face relentless pressure for change. Social and health care have been merged in several municipalities, organizations down-sized, and ideologies transformed, while patients are even more dependent, and improved and personalized services are demanded by patients and the relatives of patients (Elovainio et al., 1997; Noro, 1998; Rintala et al., 1997; Vaarama, et al., 1999). Working in care for the elderly has become more stressful, the physical load has increased and more and more skills are needed (Vaarama et al., 1999). Despite some substantial progress, much remains unchanged. There are several instances, of an organization developing quality or culture but continuing to operate as before – perhaps only changing name. The only outcome of the development may have been increased stress levels enhanced by the development process and the unreachable demands.

Why are this kind of examples so familiar? One reason may be that activities in organizations are frequently analyzed from a single perspective: as organizational structures, working environments, work organizations, organizational cultures, or the terms of skills and knowledge needed. As more effectiveness is demanded, organizations are merged or restructured, but the physical or psychological overload on employees tends to be ignored as a source of inefficiency. Training and re-training of workers are prioritized, but the strength of the established organizational culture is not realized. The power of training may be wasted if the prevailing culture is not taken into account or the job design does not allow implementation of ideas gained from training. To achieve the goals of the work while being able to analyze the factors which hinder its success requires a broader perspective than the individual or organizational one alone.

Worker's knowledge can be seen as the basis of factors guiding behavior. When analyzing knowledge it is important not only to know the content of knowledge that workers have, but also to understand information processing and goal-directed behavior. But as we know, when highly skilled individuals enter the work place, they often become frustrated when routine work procedures remain unchanged year after year. This emphasizes the need to explore the organizational culture in institutions. As the work in institutions is extremely demanding, both psychologically and physically, it is also important to understand how working practices could be organized to protect and promote the

health of workers. However, it should be remembered that many routines which are seen as needless and as barriers to the autonomy of the elderly may also be important in allowing staff to keep work controllable.

Combining these perspectives in analyzing care for the elderly is the aim of this thesis. The major emphasis is on the well-being of workers, but a broader understanding is attempted from the cognitive and cultural perspectives.

2 Theoretical background

In organizational psychology, one of the basic questions is how work and the worker fit together. Organizations attempt to find the optimal balance in order to gain better performance and quality at work (Hackman & Oldham, 1976). Researchers and occupational health care professionals focus their main interest on workers' well-being and satisfaction, but organizations are mostly interested in these themes in terms of workers' performance or financial impacts such as sick-leaves or turn-over (Arnold et al. 1995). Organizations search for the optimal fit between work and worker by at least three major approaches: locating suitable workers (personnel selection), fitting them to the optimal work structures and job characteristics (job design and organizational development), and develop their skills and knowledge. Personnel selection is not addressed here, but organizational design and development are. Skills and knowledge are also discussed.

There are two larger traditions when it comes to research of job design and interaction of work and worker. In the first one, work motivation, good performance, job satisfaction, low absenteeism and turnover are seen to result from job characteristics. Some individual differences are seen to moderate this relationship. While the basic solutions have remained rather unaltered, the underlying theories have changed from need- to information processing theories. In the second tradition the central themes are stress and (usually) negative stress reactions, which may cause serious health problems and negative behavioral outcomes. Moreover, stress theories have evolved from behavioristic stimulus-response paradigm to cognitive, transactional or cybernetic theories (Cox & Ferguson, 1991; Kivimäki, 1996; Lazarus, 1993). But the traditional approach to studying stress remains largely unchanged.

Workers' skills and learning are commonly studied as separate aspects of organizational psychology. This may be because learning is frequently understood as an individual process, where separate tasks and the skills needed for them are analyzed. This individual perspective neglects the organizational context and the social aspects of skills and learning. In organizational learning approaches (Senge, 1990), in the action research tradition (Argyris & Schön, 1985), in organizational culture research (Frost et al., 1985; Schneider, 1990) and in the research of distributed knowledge (Salomon, 1993) the organizational aspects are taken into account.

Job design and job characteristics

In the job design tradition, work itself is the object of research or development. The content and structure of jobs are seen to create outcomes such as job satisfaction, motivation and good performance. Since recognition of the problems of job simplification (Taylorism) much effort has gone into designing jobs that would ensure productivity without human costs, like health effects (Oldham, 1996). Research on job satisfaction emerged when such humane work values began to be stressed. Job satisfaction was the dominant theme of research in the 1970's, and particularly the ideas of Hackman and Oldham (1976). Nowadays, with job design being less exclusively studied, other approaches than job design have come to be examined. The number of factors believed to predict job satisfaction has increased, and research has fragmented (Blegen, 1993). However, job design is still widely applied and implemented and much study continues this research (Arnold et al., 1995; Oldham, 1996; Pöyhönen, 1987). In the present work the emphasis is on the ideas and concepts involved in of job design, but other approaches to job satisfaction are also discussed.

Theoretical background of job design

Need theories, expectancy theories, activation theory, socio-technical systems theory and motivation–hygiene theory form the theoretical background of job design (Arnold et al., 1995; Hackman & Oldham, 1976; Oldham, 1996). Cognitive aspects have more recently been applied in research (Arnold et al., 1995; Frese & Sabini, 1985; Hacker, 1985).

Underlying need theories are the basic ideas that people are active, need to develop their capacities and to express them, need to relate to groups and need to be respected (Aldefer, 1972; Arnold et al., 1995). People also appear to seek safety, which means a predictable environment. However, the theoretical background of job design was shown to be insufficient: the supposed structure of needs had no empirical basis. Moreover, no biological origin could be identified and actual behavior could not be predicted by needs (Arnold et al., 1995).

Hackman and Oldham (1976) refer to activation theory, which emphasizes the negative consequences of underactivation. This may be seen as an answer to Taylorism, where the job is split into simple, easily performed tasks. According to activation theory the nature of the job has an impact on the worker's psychophysiological activation at work. Job rotation was one of activation theory's practical solutions to monotonous, highly repetitive jobs.

Expectancy theory sees people as cognitively active decision makers able to choose between several possible actions. In the process of choosing ac-

tions, the theory sets out three important stages of appraisal. First, people consider if they have the necessary skills to do the work (expectancy), then they consider if the action will lead to identifiable outcomes which are rewarded (instrumentality), and finally they consider the value and attractiveness of the rewards (valence) (Arnold et al. 1995; Vroom, 1964). But people's behavior is also difficult to explain with expectancy theory. The theory may have had some impact on the task significance and feedback factors of the job characteristics model.

The central theory applied in job design and job satisfaction research is Herzberg's motivation-hygiene theory, which supposes that the primary causes underlying satisfaction and motivation are intrinsic to the work itself (Hackman & Oldham, 1976). These motivating factors are recognition, achievement, responsibility, advancement and personal growth. Dissatisfaction, in turn, is supposed to be caused by extrinsic factors such as quality of leadership, wages, and working conditions. It is therefore supposed that changes in these latter 'hygiene' factors cannot increase satisfaction. However, this two-factor theory has not gained empirical support; the dichotomy of the factors has not been substantiated, and there appear to be some individual differences. The other problem with the theory is the weakness of methodology (Hackman & Oldham, 1976; Oldham, 1996).

Job design has also received some input from socio-technical systems theory, which aims to optimize both the technical and social systems. In socio-technical theory, Herzberg's theory and JCT, the major principles for motivating workers are to enrich and enlarge the job. These principles are used in forming natural job entities, combining tasks and creating interaction with clients, among other (Happ, 1993; Seppälä, 1994).

Job characteristics model

Hackman's and Oldham's (1976) job characteristic model may be the best known and most frequently applied theoretical model in job design. The reason the theory is so widely tested probably lies in its well-established measurement instrument. The model has several similarities to Herzberg's theory, especially in terms of task characteristics. But the differences lie in the rejection of the hygiene factors, which Hackman and Oldham (1976) did not include in their model, in which five job characteristics are seen to cause three psychological states mediating the effects of job characteristics on the final outcomes (Figure 1). The first three job characteristics – skill variety, task identity and task significance – are seen to lead to experienced meaningfulness at work. Autonomy at work is seen to create experienced responsibility for outcomes of

the work, while feedback from work creates knowledge of the actual results of the work activities. The final outcomes are supposed to be high internal motivation, high quality work performance, high job satisfaction and low absenteeism and turnover. Personal variation in the need for growth at work, in knowledge and skills and in satisfaction with work context (mts.; Oldham, 1996) are seen to moderate these relationships. Satisfaction with work context can be seen rather similar to Herzberg’s hygiene factors.

Hackman and Oldham refer to skill utilization as workers possibilities to use skills, and their opportunities for growth at work. The idea comes from the activation theory, where activation means psychophysiological activation. When work itself requires the use of a variety of skills and provides a challenge, work is experienced as meaningful and keeps activation at high levels. Task identity, in turn, refers to the ‘wholeness’ of work, i.e. whether workers regard their tasks as an identifiable contribution to the whole, and if they can see their impact on the outcome. At the negative ends of the skill variety and task identity scales lie repetitive, underactivating work (Vartiainen, 1994). Task significance simply means that people need to understand the significance of their tasks in the working process. When they form a meaningful entity within the

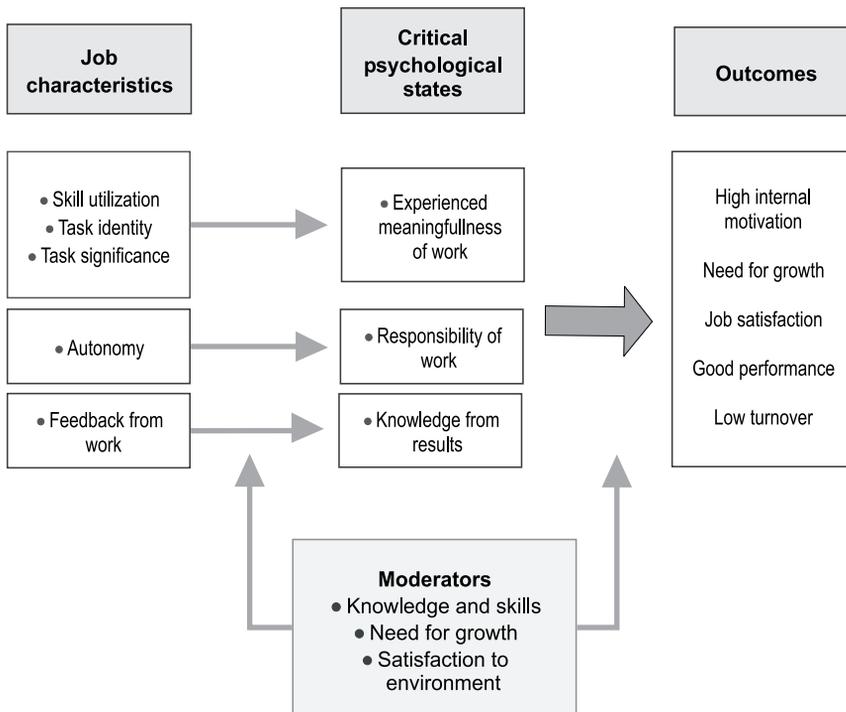


Figure 1. Job Characteristics Model

work process, the better it is also appreciated as significant. Autonomy is important because it gives a feeling of responsibility. When the worker her/himself can influence the working process, outcomes depend on the individual's efforts and decisions. Successes and failures are then experienced as a result of one's own actions, not due to a depersonalized organization. However, this responsibility requires knowledge about results; workers must be able to see the outcome of their actions.

Outcomes are related to job characteristics and to each other in the sense that when a worker sees that s/he has achieved good results at work, this knowledge produces a positive effect and satisfaction, which in turn motivates the worker to continue perform well. This internal reward reinforcement only works when the necessary job characteristics and psychological states are present. If work is fractured into small pieces it is difficult to gauge the impact of one's own contribution to good results. In such a situation, if the worker follows the rules and good results are achieved, s/he may regard his/her effort as not being significant or particularly successful (mts.).

Do job characteristics produce the supposed outcomes?

The job characteristics theory has some strengths, such as its application in practice and as a measurement instrument. But it also has some weaknesses, one of the most serious being the vague empirical support for the theory (Kelly, 1992; Oldham, 1996; Roberts & Glick, 1981; Waris, 1994).

Satisfaction and motivation

The first question which can be made is, whether job characteristics do explain job satisfaction. In most studies this relationship is not questioned. Several researchers have concluded that job satisfaction and motivation may be primarily affected by job characteristics (Blegen, 1993; Decker, 1997; Kelly, 1992; Oldham, 1996). The correlation of job characteristics and job satisfaction have varied from 0.37 to 0.88 in a number of studies (Blegen, 1993; Kelly, 1992; Oldham, 1996; Packard & Motowidlo, 1987). These studies, however mostly base on cross-sectional data.

In recent reports the stability of job satisfaction has been discussed (Blegen & Mueller, 1987; Steel & Rentsch, 1998). In several longitudinal studies the scores for job satisfaction correlate highly even for employees who have undergone occupational changes (mts.). This stability has been explained by personality factors, and there have been discussions on whether dispositional factors account for a major part of the differences in job satisfaction. The answer to this has serious implications when job design is being considered to increase

satisfaction. If employees are either satisfied or dissatisfied due to their personality, is there any use trying to develop job satisfaction? However, it has also been noted that the stability of scores decreases over time, which would lend support to the original idea that satisfaction is related to situational factors. Also, there is evidence that job characteristics predict job satisfaction even if personality and attitudinal stability is taken into account (Steel & Rentsch, 1998). Moreover, Kelly (1992) has shown that improvement in job content has mainly increased job satisfaction in re-design studies.

In the study of Steel and Rentsch (1998) the stability of job satisfaction over time was high. But when the sample was divided into two groups, where the first group informed that no changes had happened at work between measures and the other that changes had happened, the stability was different. In the group performing a similar job throughout the stability of satisfaction was high, but in the other group it was significantly lower. Steel and Rentsch also showed that some individuals have a strong tendency to stability in their scores, independently of situational factors. For these individuals job re-design has a relatively small effect, whereas for the remainder situational evaluation of job contents may have a significant effect on job satisfaction. For this latter group job re-design may thus be valuable.

The job design tradition has also been criticized for narrowness. Algera (1990), for example, attacks the model for not taking into account the organizational and social factors. Karasek (1989) points to the lack of a sound theoretical basis and the narrowness of the approach, arguing that while theories of job design categorize the important elements of the task the real causal relationships and the reasons for them remain unexplored. Karasek's objections stem from the critique of expectancy theory and "the difficulty of determining 'needs' exogenously" (mt.). He demands a less simplistic model, in which the importance of control would be more carefully analyzed. The model developed by Karasek is discussed later.

In addition to job characteristics several other variables have emerged to explain job satisfaction (Blegen & Mueller, 1987; Decker, 1997) and stress has also been linked to it (Packard & Motowidlo, 1987). These other variables include fairness (distributive and procedural justice), communication with peers and supervisors, commitment, age and tenure. Campion and McClelland (1991, 1993) also mention that there are other approaches to redesigning work (see also Spector et al., 1989). They have attempted to combine several of these and to analyze their benefits and costs (compare Oldham 1996), which include training time needed in the job, likelihood of errors, mental overload, stress, physical load, and costs in equipment and job environment.

Oldham (1996) admits that other approaches may be important in job de-

sign and that organizational climate and other factors may affect job satisfaction. He refers also to other job characteristics, like time pressure, intellectual demands and required physical movement, which would be important to study in the job characteristics context (compare Arnold et al. 1995). But this does not diminish the importance of job characteristics as predictors of motivation and satisfaction. The job characteristics model concerns only the task characteristics but does not exclude of other important factors at the work-place. Even if other things at the work-place are in order, work should be arranged properly. But the theoretical background of job design has not been extensively developed. Instead, job satisfaction is frequently linked to a broader theoretical background; it is no more seen as a function of purely job design, but more as an attitudinal or affective outcome of stress or job demands. Job characteristics are mostly seen as stressors at the negative end of scales. The relationships between job satisfaction, job characteristics and stress are discussed later.

Performance

The job characteristics model supposes that well organized work not only affect job satisfaction but also workers' performance. Several studies have indicated that job characteristics do not explain productivity or performance well (Ganster, 1989; Karasek, 1989; Kelly, 1992). Although a definite effect has been found, job characteristics have been able to explain only six or seven per cent of performance variation (Oldham, 1996; Packard & Motowidlo, 1987). The effect of job satisfaction on work performance is less evident. Several studies have found no relationship between satisfaction and performance (Goodell & van Ess Coeling, 1994; Kelly, 1992). However, there are several other factors than job characteristics which do explain both job satisfaction and work performance. In the health care sector these factors have found to be leadership, organizational climate, continuity of staff, education, the nursing model, and the functional abilities of the patients (Kruzich et al., 1992; Leveck & Jones, 1996; MacGuire, 1991; McNeese-Smith, 1999; Nissen et al., 1997; Sheridan et al., 1992; Smyer et al., 1991; Teresi et al., 1993).

These results support Kelly's (1992) findings that whereas job characteristics may explain a large part of the variance in job satisfaction and motivation, performance is largely explained by variables other than job characteristics, such as – in addition to the variables already mentioned – ineffective co-operation, inadequate knowledge, skills, and attitudes, ineffective administration and poorly organized work in terms of information processing (eg. Campion & McClelland, 1991, 1993; Sheridan et al., 1992; Spector et al., 1989).

Whether the effect of job characteristics on performance is mediated through

job satisfaction, motivation or stress-related illnesses has also been discussed (Karasek, 1989; Packard & Motowidlo, 1987). Kelly (1992) sees the mediating effect of motivation as the most likely, and the other effects as improbable.

It is also possible that some variables interact with satisfaction to moderate the relationship between job characteristics and performance or satisfaction and performance, such as skills and abilities (Brannon et al., 1988; Smyer et al., 1991; Varca & James-Valutis, 1993). Varca and James-Valutis have found evidence supporting this moderating effect. In their study, job satisfaction among more skilled workers had a strong relationship with performance, but among less skilled workers job satisfaction and performance were not related.

Turnover

In the job characteristics model low turnover is supposed to be an outcome of good work. As with work performance, job characteristics may be one variable affecting turnover, but probably not the only one. Other variables relate to work roles, work overload or leadership. Combining several approaches to study turnover, Parasuraman (1989) has developed an integrated model of job characteristics, organizational variables, personal variables, attitudinal variables and behavioral intentions affecting turnover. The first modification we may make to the job characteristics model derives from the fact that in several conceptual models (Parasuraman, 1989) the effect of job characteristics is indirect and mediated through attitudinal variables like stress, job satisfaction and organizational commitment. This list may be supplemented by experienced procedural justice at the work-place (Elovainio & Kivimäki 2000). Despite this indirect link the five job characteristics are usually included in the list of affecting variables. But this mediation of effect may explain, why the predictive strength of job characteristics on turnover is rather low. Another explanation may be that work-related factors simply do not explain much of turnover. As the results of Parasuraman show, different situational factors explain the majority of turnover, and work-related factors only 5 to 15% of variation (Banaszak-Holl & Hines, 1996; Parasuraman, 1989).

Objectivity of the measurement instrument of Job Characteristics Theory

The objectivity of the measurement instrument of Job Characteristics Theory has been discussed. While the measurement is based on the questionnaire survey, it is difficult to distinguish between objective job characteristics and the subjective, perceived characteristics. In the original model the reported job characteristics are seen as objective and the critical psychological states are distinguished from these. In the model some personal variables are seen as moderators in the interaction between job characteristics and the outcomes.

But according to some studies personality, social cues, mood, attitudes and environmental factors also affect the perception of job characteristics (Blau & Katerberg, 1982; Oldham, 1996; Spector, 1992). In recent work, however, at least job control has been showed to have variance between working places, not only between individuals (Söderfeldt et al. 1997). This means that it is not only the experience of control, but the objective control that has an impact on worker outcomes (exhaustion and health in the study of Söderfeldt et al.).

Another possible problem with questionnaires – not only in the Job Diagnostic Survey – is that they are based on a single questionnaire form, where respondents answer questions on both job characteristics and the outcome measures (method variance). There are several possible sources of method variance in questionnaires. Personality variables like negative affectivity, self efficacy and literacy, may affect how people tend to answer. Specifically concerning The Job Diagnostic Survey there may arise the problem that workers who like their jobs report the characteristics more positively.

In several studies method variance has been found to cause ‘too high’ correlations between variables (Arnold et al., 1995; Oldham, 1996; Spector, 1992; Waris, 1994). Frequently, correlations between ‘objective’ job characteristics measured by other means than questionnaire and outcomes are significantly lower than in mono-method measures. This dilemma is debatable, however, and there is contradictory evidence about the effects. Other studies have found that this method variance inflates correlations. What has been found quite clearly in the area of method variance is that in JDS the negative items form separate factors (Oldham, 1996; Spector & Brannick, 1995).

Despite these problems, there is little evidence that self-reports are dramatically affected by social cues, personality or method variance. As Spector (1992) claims in his review, there is considerable evidence that these measures reflect the objective environment. In other reviews too, the Job Diagnostic Survey has been found to correlate well with objective characteristics of work measured by other methods. This means that some of the variance in job characteristics can be explained by objective variance (Arnold et al., 1995; Oldham, 1996; Spector, 1992; Steel & Rentsch, 1997; Söderfeldt et al., 1997).

Reliability of the measurement of job characteristics

Concerning the reliability of JCT there has been discussion about the structure of the measurement instrument, the Job Diagnostic Survey. Much research has focused on the factor structure. In several studies the analyses have not created the original factor structure, except that the items have formed from 2 to 6 factors and some items have loaded on several factors (Oldham, 1996;

Waris, 1994). As noted earlier the negative items tend to form their own factor. Another possible explanation for the inconsistency of factor solutions may be variance in the ability of employees to differentiate job characteristics. In some studies the factor structure has been similar to that assumed among more educated and younger employees, and those in higher positions (Oldham, 1996).

Discussions about the objectivity of the method mainly concentrate on the question of whether it really measures the objective job characteristics. What is largely ignored is the question of what actually affects the outcomes: the experienced reality or the objective reality. There is wide debate concerning autonomy and skill variety, and this is presented in the section on stress research.

Cognitive theories in job design

Study of job design has been largely unchanged for more than 20 years. Theories concerning human behavior have developed in several directions. The popularity of the cognitive approach has expanded and it has also been applied in job design. Practical implications derived from the cognitive approaches and goal-setting theories have been rather similar to those derived from job characteristics theory (Arnold et al., 1995; Frese & Sabini, 1985; Hacker, 1985; Lord & Maher, 1989; 1991). For example, skill utilization, feedback and autonomy are seen as important, although the reasoning is different. In order to form accurate representations of work (or any environment of behavior) people need to have feedback about the results of their actions (Elovainio & Kivimäki, 1996). Autonomy is regarded as important when people are active decision makers, directing their actions by setting goals and making plans. Karasek (1989) also discusses skill utilization and autonomy, but mostly in relation to health effects. In Karasek's work the key factor is the interaction of job demands and control (Karasek's concept of control comes near to a combination of skill utilization and autonomy), which have effects on worker health, motivation, learning, competency development, and at the last stage, productivity (Karasek, 1989). Karasek sees demanding jobs with high levels of control as active, involving possibilities for learning. Situations with high control leave space for free information processing and decision making (Lord & Maher, 1991). They also give freedom to change the problem-solving strategy when needed; and the most efficient situations for learning are the demanding ones. Karasek's ideas lead to the basics of cognitive theories of self-regulation of human action. As human behavior is understood as active and intentional, control is something that people evidently need in their interaction with the environment.

Cognitive theories also make the situation more difficult. As goals and intentions are seen as important, this also means that goals may be different from person to person. This topic is discussed further in the following chapters.

Stress theories

Theories of stress stem from several origins. Despite a degree of conceptual vagueness, stress may be seen as a mismatch between the environment and the person. Usually this mismatch is regarded as harmful and causing some negative reactions in the person. In most theories it is possible to find three elements: the source of stress (stressors), mediators of stress, and the outcomes of stress (stress reaction, strain). (Arnold et al., 1995; Cox & Ferguson, 1991; Kivimäki, 1996; Lazarus & Folkman 1984; Pearlin et al. 1981).

Cox and Ferguson (1991) identify three approaches to the study of stress (see also Kivimäki, 1996). The first approach (stimulus- or stressor-focused or engineering approach) sees stress in terms of factors in the person's environment, and mainly focuses on identifying stressors and evaluating their capacity to explain the variance in stress reactions. The second approach (response-based, stress reaction focused or medico-psychological) is based on stress reactions and the mechanisms underlying the process when a person is under some aversive or noxious stimuli. Based on the work of Selye, stress used to be seen as the body's generalized and non-specific response to any stressor. Selye supposed (Lazarus, 1993) that all kinds of stress create a bodily response, the General Adaptation Syndrome, starting at the alarm stage, continuing with adaptation and ending at exhaustion (if stress continues and adaptation, or the defence mechanism, fails) (Arnold et al, 1995). This general response has not, however received empirical support (Lazarus, 1993). Both these approaches are criticized for their reliance on the stimulus-response paradigm, where individuals are seen to be affected by external forces which cause stress. This ignores individual differences and cognitive processes in the perception of stressors, and any mediating processes between stressors and the stress reaction (Arnold et al., 1995; Cox & Ferguson, 1991; Kivimäki, 1996; Lazarus & Folkman 1984). In the third approach (psychological, interactional or transactional) the psychological aspects of the stress process are taken into account and the process is seen as an interplay between person and environment.

The earliest work considered as transactional was that of Richard Lazarus, beginning in the 1960s (Lazarus, 1993; 1995; Lazarus & Folkman, 1984; Steptoe, 1991). In Lazarus' model the stress process begins from appraisal, when a

person evaluates the situation as harmful, threatful or a challenge, or as not relevant in these terms (primary appraisal). To be appraised as a threat requires that the interaction with the situation is in some way seen as important to one's personal goals. If the situation is seen as unimportant to one's life it is not likely to be understood as a threat. Subsequently, the person begins to evaluate the possibilities of dealing (coping) with the situation (secondary appraisal). In both appraisals the individual's beliefs and values are important.

After evaluation, the coping mechanisms are activated. Coping mechanisms may be divided into problem-focused and emotion-focused. Problem-focused coping aims at altering the situation by seeking information about what needs to be done and how to change behavior. In emotion-focused coping the emotional distress is regulated in several ways, such as by avoidance, changing the meaning of the situation, denial, or thinking positively. In choosing the coping strategy the evaluation of control in the situation is important. If the harmful situation is seen as possible to influence by the individual's actions, problem-focused coping may be chosen. Coping strategies may vary from one situation to another and over time (mts.), and people may moreover differ in their likelihood of choose a particular coping mechanism (mts.; Havlovic & Keenan, 1995; Steptoe, 1991).

While coping and the transactional approach may seem a useful theory, empirically it is rather difficult to distinguish coping from the stress reaction (compare Steptoe, 1991). It is also difficult to distinguish primary appraisal from secondary appraisal, and these from decision making (Cox & Ferguson, 1991; Kivimäki, 1996). In addition, coping and primary appraisal are sometimes closely linked, because coping makes it possible to alter the meaning of a stressful situation (Folkman, 1984; Frese, 1989).

While Lazarus calls for research on individual patterns of stress there is also a need to identify more general stressful conditions of work (Brief & George, 1995). Brief and George admit the individual processes in the stress process, but simultaneously claim that some work conditions also affect the well-being of most workers. Even though this is true, stress research should concentrate more on the individual patterns. Frequently forgotten are the possible multiple meanings of stressors. For example, autonomy is widely accepted as a self-evident fact, even though individual meanings of autonomy may differ. It has been claimed that not all people want to have autonomy, but the content of autonomy at the work-place has not been discussed (compare Folkman, 1984; Lazarus, 1995).

Stressors

Lists of stressors and job characteristics are quite similar, and the difference between them is rather vague. One difference is that stressors include many other factors besides job content and work organization. Another difference is that important job characteristics are supposed to be common to every job, while stressors may vary and each occupation has its own typical sources of potential stress. In transactional stress theories stressors are not seen as objective. Stressors must be interpreted as harmful, whereas job characteristics are understood as objective in nature and thus not needing appraisal. In practice, however, stress research has also studied stressors as objective factors (Lazarus, 1993).

The transactional approach sees the source of stress as individual, and criticizes the numerous lists of stressors (Cooper & Payne, 1987; Lazarus, 1995). Nevertheless, it is admitted that some working conditions are stressful for most people, and these can be divided into several categories. Typical stressors would be 1) factors intrinsic to the job like work overload, physical conditions (noise, heat), monotony, time pressure, lack of autonomy, etc.; 2) role factors, like role conflict, ambiguity of role or responsibility; 3) relationships at work and with management; 4) organizational climate and culture; 5) personal characteristics, like age, type A behavior, hostility (Arnold et al, 1995; Cox & Ferguson, 1991; Di Salvo et al., 1995; Hendrix et al, 1995; Kivimäki, 1996; Sawyer, 1992). Stressors typical to health care are discussed later. Frone and others (1995) also assert that work-related stressors should not be overestimated, because non-work stressors and those from work-family conflicts are highly correlated, as they show in their study. They suggest that potential stressors such as these should be studied in contrast to work-related stressors.

Lazarus (1995) emphasizes that stress research should be conducted both intra- and inter-individually, which means that the same individuals should be studied over time; while different individuals should be compared in the context of their own goals and meanings. In Lazarus' thinking workers are supposed to be fairly well aware on what basis they are working and what their goals are. He also assumes that people always know what bothers them (also Summers et al., 1995). But are all cognitive and emotional processes so conscious? Much of our self-regulation is based on automated processes and in working life we do not always know why something is done; often it has simply been done that way as long as anyone remembers (Lord & Maher, 1991). Would our goals and emotions make any difference?

Control

Control is one of the most studied stressors. As a stressor in the negative sense it is important, but here it serves also as an example of the complex phenomenon of the stressor. In its original form control meant workers' control over work conditions and skill utilization (Gardell, 1982; Karasek, 1981, 1989). When compared to the job characteristics model Karasek's concept of control comes quite close to autonomy and skill utilization. In the original model control was not meant to be a stressor as such, but a moderator in the interaction of work load and strain. This interaction effect has gained ambiguous support, but low control has been found to be a stressor as such in various studies and to explain several outcome variables besides strain (Bosma, et al., 1998a,b; Ganster, 1989; Marmot, et al., 1997; Sauter, 1989). This latter effect has been seen largely as a consequence of small, homogenous samples. In large, multioccupational studies the interaction effect has been found, and some other studies also support the model (Dollard & Winefield, 1998; Fox et al., 1993; Karasek, 1989; Kivimäki et al., 1998; Landsbergis et al., 1994; Theorell et al., 1998). In addition, a recent study of human service work using multi-level modelling found evidence of an interaction effect proceeding to emotional and quantitative strain and exhaustion. In mental health this effect has been found only with emotional work loads. With quantitative work loads the effect was opposite: the less control and the heavier the quantitative work load, the healthier the workers were (Söderfeldt et al., 1997)! The authors explain this in terms of coping: in human service work the demands are mostly emotional ones relating to client service, and a high work pace may relieve workers of some emotional involvement with clients.

Contradictory results in control studies may partly be explained by certain vagueness of the concept (Ganster, 1989). As noted, Karasek's concept consisted of autonomy and skill utilization, whereas most studies have focused only on participation or autonomy in general – and not necessarily on control of those factors that might be important in the job in question. In experimental research control is studied as control precisely over the stressor in question. In some studies, however, what has been studied is only predictability, not control (Ganster, 1989; Steptoe, 1991). Thus, in experimental research, control usually means controllability over or predictability of a situation. In the workplace autonomy does not always mean increased controllability or predictability; in complex work settings autonomy may increase uncertainty and decrease predictability (compare Jackson, 1989; Leppänen, 1993; Schönplflug, 1985). These questions are closely related to mastery at work. Autonomy also increases responsibility, and not all workers want more responsibility.

What should also be taken into account is the personality of workers. If the

perception of internal control (locus of control) is low it is supposed that increasing job control would not relieve stress (Folkman, 1984; Jackson, 1989). Frese (1989) has used the concept 'need for control', meaning the amount of control people want over the job, and in the opposite way, how much lack of control people will stand. There is some evidence that among people with high need for control lack of control may itself be a stressor (Dwyer et al., 1992; Frese, 1989). But there is also a possible moderator effect, where the lack of control may increase the effect of other stressors among workers with high need for control. (Frese, 1989.) There is some evidence that need for control is related to the level of hierarchy of workers.

There are several possible reasons why control would be such an important factor at work. Predictability and relief from uncertainty have been mentioned (Jackson, 1989), and control may also reduce other stressors (direct effect on stressor) (Frese, 1989). If the person has a high degree of control, s/he can rearrange the job to decrease any stressors (e.g. by taking a pause when needed, or making time to plan a difficult task properly). It is also possible that control does not decrease the actual objective level of the stressor but only its perceived level as the result of a more holistic view of the situation. However, Frese has not found evidence for this hypothesis. It should be noted that to study this effect the measures should be very strictly targeted.

There are also some theoretical moderator effects (as the Karasek model supposes). Thus, while control may not reduce the objective stressors, it does have an impact on the effect of these stressors. There may be some stressful event involved in the job which cannot be avoided no matter how much control the worker has. Nevertheless, control over the timeframe of events may reduce the experienced stress (which means that control does not affect the stressor, but the perceived stressor or stress appraisal). For example, the worker may tackle unpleasant tasks first thing in the morning when s/he is relaxed, or just before leaving work, if it suits him/her better. According to Frese (1989) there is no evidence that control can affect how workers perceive stress, but it does influence how many psychosomatic complaints they have. Control may also serve as a signal of safety, for which Frese (1989) has found some evidence. There is also some indication that control has an impact on the experience of the experiences of fairness in the organization in question, which is closely related to safety (Elovainio et al., 2000).

Folkman (1984) has revealed the complexity of studying the effects of control. First, the appraisal of control consists of both situational elements and generalized beliefs about control (locus of control). Thus, measurements of perceived control may refer to both personality and the real situation. Locus of control does not, however, make any difference if the situation is clearly de-

defined, so that it is obvious whether a person has control or not. But if there is ambiguity, making it difficult to know whether one can affect the situation or not, people with an internal locus of control may appraise it as controllable. The second difficulty is that stressors have different meanings for people (see also Leppänen, 1993). The value of a stressor depends on the commitments involved in the situation. At work, time pressure, for example, has several meanings relating to commitment. It may relate to physical load as such, when there are no pauses and accomplishing tasks requires working top speed. Time pressure may also be seen as a measure of effectiveness – workers see themselves as useful if they have time pressure. It may also serve as a relief from demanding relationships with clients or patients. But time pressure is also related to perceptions of quality of care. Nurses tend to feel, that they have too little time for patients, and only for the most important tasks. (Kivinen & Lehtonen., 1984; Söderfeldt et al., 1997.) The different meanings of time pressure show that stressors are related to the ideology or goals that workers have. Control is mostly studied as a stress reducing influence, but it may carry other meanings too, and may also itself generate stress. Having control may require some effort, like participating in some activity (e.g. a development group at the work place). It may also signify or entail something unpleasant socially, or extended responsibility for certain actions (Folkman, 1984).

Karasek (1989) sees the importance of control particularly in the sense that it directs the ‘potential energy’ supplied in the arousal. Karasek’s idea is that increased demands generate physiological arousal in the body (raised heart beat, adrenalin secretion). If the worker has sufficient control s/he can optimally channel the energy needed. Although Karasek himself does not refer to coping, the idea comes close to problem-focused coping, where the energy is directed towards actions aimed at lowering stress. As Folkman (1984) has shown, when coping aims at reducing stress it may also reduce stressors. Thus, it is difficult to empirically show whether control reduces stressors or the effects of stressors. Karasek’s idea of control is not experienced control but having the real option of making decisions and realizing plans in the situation (compare Gardell, 1982; Leppänen, 1993; Söderfeldt et al., 1997). Bosma et al. (1998a,b) have shown that control (rather than the interaction of control and demands) has a direct effect on coronary heart disease, and that the control in question is the objective and not experienced control. They have also proved that the effects of control on heart disease are not mediated by stress, and that personality (like negative affectivity) does not explain these results. Landsbergis et al. (1994), in turn, have proved that the interaction of control and demands influences blood pressure, which may be the biological mechanism linking strain to cardiovascular disease (see also Fox et al., 1993).

There is more evidence that control, as such, has physical effects. As the review of Steptoe (1991) shows, in controllable situations the hormones released relate to effort, whereas in situations of low control they relate to distress. Control is usually related to problem-focused coping, and low control to emotion-focused coping. The experienced control cannot be forgotten, however. Bosma and others (1998) note that it is unlikely that control would have obvious effects on stress, without appraisal. Even if control does have some physical effects, individuals may not identify them as stress. According to Bosma et al. (1998) control only potentially produces a stress reaction. The information on having control must be interpreted, and personality plays a role in that interpretation. The link between problem-focused coping and control may seem positive at first hand: control decreases stress, because it promotes more effective coping. But the effectiveness of coping is rather complex and problem-focused coping may not always be the most effective way (Folkman, 1984; Frese, 1989; Steptoe, 1991). Furthermore, persistence in using only control-oriented coping mechanisms may increase the emotional load, which has been related to Type A behavior (Havlovic & Keenan, 1995).

Stress reactions

Stress manifestation is a very complex phenomenon, because there are multiple ways in which stress may be reflected. Depending on the research tradition, various manifestations are seen as the truest reflections of stress. But there is no agreement on this topic. Physiologically oriented researchers see hormonal responses as the clear reflection of stress, whereas a psychologically oriented researcher may claim that the subjective experience is the best measurement (Pearlin et al., 1981). Antecedents of stress (strain, strain symptoms) may be divided into psychological, physical and behavioral outcomes (Kalimo, 1987).

Psychological outcomes

Psychological outcomes may arise as emotional, motivational and cognitive symptoms. Typical emotional symptoms include irritation, tension, disappointment, anxiety and nervousness. Motivational symptoms would be unusual tiredness, loss of interest and difficulties in initiating tasks. Difficulties in concentration and changes in cognitive functioning are typical cognitive symptoms; there is some evidence that cognitive processes become more simple, but also more extreme. It is common that in chronic stress situations the ability to appreciate opposing viewpoints suffers, as does one's flexibility of attitudes. Making decisions also becomes more difficult. On the other hand, the impact of cognitive

resources in the stress process is rather poorly understood (Elovainio, 1991; Kalimo, 1987; Payne, 1991).

Physical outcomes

Although physical outcomes of stress have been reported in numerous studies, the mechanisms of the stress process remain incompletely understood. Stress has been noted to have some effect on a wide range of illnesses, such as coronary heart disease, high blood pressure, headache, migraine, stomach pain, depression and musculoskeletal disorders (Arnold et al., 1995; Bosma et al., 1998a,b; Hendrix et al., 1995; Kalimo, 1987; Karasek, 1989; Kivimäki et al., 1997; Landsbergis, et al., 1994; Marmot et al., 1997; Pearlin et al., 1981; DiSalvo et al., 1995; Theorell et al., 1998; Vuori, 1993). Most of these diseases are of multifactorial origin and the causal effect of stress is rather difficult to show. Nevertheless, while the mechanisms are obscure, some parts of the process are rather well-known. Stress affects the hormonal and autonomic nervous systems. These systems, in turn, influence the cardiovascular, gastrointestinal, immunological and musculoskeletal systems. In a short-term stress situation heart beat and breathing rate become more rapid, blood pressure rises and muscular tension increases. As short term reactions these are not harmful, but when there is insufficient time for rest and recovery, they may develop into chronic problems or promote illnesses like cardiovascular and heart disease, flu, gastrointestinal problems and neck or back pain (Bosma et al., 1998a,b; Kalimo, 1987; Landsbergis et al., 1994; Marmot et al., 1997; Steptoe, 1991; Theorell et al., 1998; Vuori, 1993).

Musculoskeletal disease and stress

Musculoskeletal diseases are a major problem in health care (Jensen, 1987; Mandel & Lohman, 1987). They are frequently blamed on physical load, and on ergonomic problems such as bad lifting techniques. Most preventive efforts focus on exercise or lifting techniques (Mandel & Lohman, 1987; Torgen et al., 1995; Viikari-Juntura et al., 1991; Wikström, & Pentti, 1998).

However, there is a growing tendency to view musculoskeletal disorders as having multifactorial origins (Bildt Thorbjörnsson, 1999; Bongers et al., 1993; Josephson, 1998; Wikström & Pentti, 1998). According to Bongers et al., only 20% of disease may be explained by physical load. There are several findings suggesting a causal association of psychosocial factors and musculoskeletal disease. High perceived work load, time pressure, monotony, lack of social support, control, personality and stress have all been found to relate to musculoskeletal symptoms (Bildt Thorbjörnsson, 1999; Elo, 1989; Frankenhauser, 1981;

Josephson, 1998; Lazarus & Folkman, 1984; Wikström & Pentti, 1998; Winnubst et al. 1982). Moreover psychosocial factors outside work have been indicated as risk factors for low back pain, especially among women (Bildt Thosbjörnsson, 1999).

Bongers and others (1993) have reviewed major research on how psychosocial factors might affect musculoskeletal symptoms. First, there is a large area of studies on correlations between personality and musculoskeletal symptoms. Individual psychological makeup appears to be an important factor in the development of musculoskeletal disease. Secondly, psychosocial factors may have effects on physical load (Bongers et al., 1993; Josephson, 1998). For example, the organizational culture may affect the importance workers place on using mechanical tools in lifting patients or asking for assistance to move a patient to the bathroom. And time pressure or routine work operations may lead to ineffective lifting techniques or hurried movements (Josephson, 1998). Thirdly, stress has been linked to the development of heart disease and gastrointestinal problems, but quite rarely to musculoskeletal problems. There are, however, some plausible links between stress and musculoskeletal symptoms. First, short-term stress increases muscle tone. If there is insufficient time to relax, muscular tension may develop as a chronic condition and lead to back and neck pain (Bongers et al., 1993; Kalimo, 1987) Long-term stress, in turn, may lower in muscle tone and pressure in some parts of the spine, thereby causing back pain (Vuori, 1993). It is also possible that stress moderates the effect of mechanical load on musculoskeletal problems. Stress may have effects on the perception of symptoms or it may decrease the capacities to cope with them. It may also undermine health, which may intensify musculoskeletal problems. There are also several possible ways that psychosocial factors could affect the development of stress.

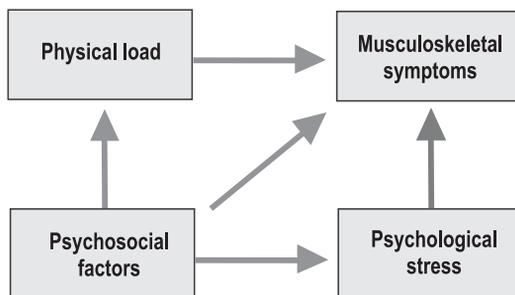


Figure 2. Model of the association between psychosocial factors and musculoskeletal symptoms (modified from Bongers et al., 1993).

In conclusion, psychosocial factors may have direct effects on stress, on mechanical load or, on musculoskeletal disease. They may also moderate the effect of other stressors or physical load (e.g. personality or control may moderate the effects of mechanical load on musculoskeletal symptoms) (Kivimäki, 1996). Although several relationships have been found between psychosocial factors and musculoskeletal symptoms, the mechanisms linking them have not been fully explored (Bildt Thosbjörnsson, 1999; Bongers et al., 1993; Josephson, 1998).

Behavioral outcomes

The field of behavioral outcomes is rather large; one area is the behavior related to coping - usually to unsuccessful or so-called negative coping (Kalimo, 1987; Steptoe, 1991). The purpose of such behavior is to avoid or forget stressful situations. Typical ways of doing this are consuming coffee, tobacco, alcohol or sedatives.

The other area of behavioral outcomes concerns organizational symptoms, which relate to performance or commitment. Absenteeism and quitting are the typical problems here, and they, too, can be seen as coping strategies. If chronic stress cannot be reduced or workers fail to adapt to it, their final solution is to quit the job. Quitting and absenteeism are also related to commitment, and with absenteeism, particularly the short spans (1 to 3 days off) of sickness absence. Longer absence is generally attributed to such things as colds, flu or musculoskeletal symptoms. Naturally, both short and longer sickness absences are assumed to be for genuine reasons, but stress is seen as an important cause of the sicknesses involved (Hendrix et al., 1995; Kalimo, 1987; Kivimäki et al., 1997).

Stress may have several outcomes on work performance. Such outcomes are mainly regarded as negative, but stress may also have some positive effects which activate people to high performance (Sullivan & Bhagat, 1992). The oldest model of the effects of stress on work performance is the Yerkes-Dodson law which supposes that at either low or high levels of stress performance is low, but at moderate levels high. This inverted U-shaped relationship has gained modest supporting evidence (Sullivan & Bhagat, 1992; Jamal, 1984, 1985). Most research supporting the hypothesis has been performed in laboratories or unusual workplaces. In most studies stress is assumed to be a negative phenomenon and stress levels do not vary enough to really test the theory. The hypothesis of a negative linear relationship has gained some support. In stressful events people are seen to waste their energy on coping, or on undesirable activities (Sullivan & Bhagat, 1992).

Stress may also erode social relationships as interest in them declines, atti-

tudes become more extreme and flexibility hardens. As cognitive functioning becomes more basic, proneness to error grows and the quality of work may suffer (Arnold et al., 1995; Kalimo, 1987; Payne, 1991). Stress may also mediate its effects via stress reactions. It can be assumed that such stress-related symptoms as unusual tiredness, anxiety, depression or difficulties in initiating activities may influence performance. For example, Motowidlo and others (1986) discovered that stress affected performance through feelings of depression. However, the relationship between stress and performance may be moderated by factors like commitment, personality, need for achievement and social support (Sullivan & Bhagat, 1992).

The concept of control also has important connotations in learning. Karasek (1989) has postulated that in jobs with high control and high demands not only are stress levels lower, but motivation and learning are much more likely than in the opposite situation. Learning appears to be more efficient in challenging situations. But control also enables people to evaluate their actions, change problem-solving strategies and correct actions. This could be one of the long-term effects stress has on performance. Although not widely studied, there is some recent evidence for this theory. Dollard and Winefield (1998) found that active, challenging work is related to active coping styles, and also that long-term exposure to passive work may lead to personality changes (eg. negative affectivity). On the other hand, the effect of personality on stress and on the relationship of stress and learning are not fully understood.

Relationships between stress and job satisfaction

The relationship between stress and job satisfaction is rather mixed (Packard & Motowidlo, 1987; Pöyhönen, 1987). Most researchers see job stress as reducing job satisfaction, and optimal workloads or optimal stress as raising it (Fogarty et al., 1999; Hendrix et al., 1995; Kalimo, 1987; Norbeck, 1985; Parasuraman, 1989; Scheck, et al., 1997; Sullivan & Bhagat, 1992; Summers et al. 1995). Sometimes job satisfaction has been used as an indicator of stress symptoms (Lobban et al., 1998). Scheck et al. (1997) discovered that stressors affected job satisfaction (and other indicators of subjective well-being). Hendrix et al. (1995) found that stressors affected both felt job stress and job satisfaction, and Norbeck (1985) and Fogarty et al. (1999) got similar results. Summers et al. (1995) reported that felt stress had an impact on job satisfaction and motivation (see also Sullivan & Bhagat, 1996). In the study of Hendrix and others, felt job stress affected job satisfaction and emotional exhaustion, but job satisfaction also affected emotional exhaustion. Iverson et al. (1998), in turn, formed a causal model in which job stress (role stress) had an impact on

emotional exhaustion, depersonalization and personal accomplishment, which all influenced job satisfaction. Packard and Motowidlo (1987) found that stressors had an effect on felt stress, felt stress on depression and depression on job satisfaction. Scheck et al. (1997) reported that stressors affected psychological stress symptoms, which had an impact on emotional coping. Emotional coping, in turn, affected job satisfaction, but psychological stress symptoms did not have a direct effect on job satisfaction, although stressors did. In addition, Fogarty et al. (1999) observed that both stressors and strain had an impact on job satisfaction, while coping did not.

Packard and Motowidlo (1987) have demonstrated that there is much ambiguity in the research of stress and job satisfaction. This frequently stems from the ambiguity of stress research (also Sullivan & Bhagat, 1992). What is meant by stress varies. In some studies stress refers to stressors (e.g. perceptions of the frequency of some events, like role conflict occur), while in others it means felt stress (experienced stressfulness), and still others psychological (or other) symptoms. Thus in some studies stressors are related to both stress symptoms and job satisfaction (Fogarty et al., 1999; Norbeck, 1985; Sullivan & Bhagat, 1992), while in others felt stress is related to satisfaction (Packard & Motowidlo, 1987), and in others stress symptoms are related to satisfaction (mts., Fogarty et al., 1999). Job satisfaction is also seen as an intervening variable between stressors and stress symptoms (Lobban et al., 1998) whereas Fox et al. (1993) see job satisfaction as an attitudinal and affective outcome of stress.

What may be concluded is that in most studies the hypothesis of the causality from stress (stressors or felt stress) to job satisfaction is supported, while the results of the other alternative are not reported (Hendrix et al., 1995; Lobban et al., 1998; Packard & Motowidlo, 1987; Sullivan & Bhagat, 1992). But when it comes to the effect of different stressors on satisfaction, or the relationships between task characteristics and stressors and between job satisfaction and stress symptoms, there is little unanimity. In some cases employees may be rather satisfied with their jobs while having abundant stress symptoms (Sinervo, 1994). Job satisfaction and stress cannot be understood as a unified phenomenon. If the ideas of Fox et al. (1993) and Scheck et al. (1997) are combined, the ambiguity of such findings become more understandable. If job satisfaction is seen as an affective outcome of stress it is probable that it is an intervening variable between stressors and stress symptoms. It is also logical that emotional coping can mediate the effect of stressors on job satisfaction. And further, as Scheck et al. (1997) discovered, stress symptoms do not necessarily influence satisfaction (although in some studies this relationship has been found). It is fairly understandable that not all health problems related to stress have an effect on satisfaction, because employees do not realize them to be caused by

work-related factors. Stressors, in turn, should not necessarily be related to work, and physical stress symptoms, for example, may be due to several other causes.

What might also explain some of the vagueness is that in the relationship of stress and job satisfaction there are numerous possible moderators such as personality variables, profession, type of stress, job involvement, social support, control and sense of competence (Iverson, et al., 1998; Karasek, 1981; Sullivan & Bhagat, 1992). There is, for example, some evidence that individuals with high competence are more satisfied when organizational stress is high. What also complicates conclusions is that the stressors studied vary and may act differently (Sullivan & Bhagat, 1992).

Differences in the stress reaction

It is not fully known what causes the differences in stress reactions. Following Selye's theory of general physiological reaction against any stress evidence has emerged that not all stressors create similar reactions (Elo, 1989; Winnubst et al. 1982). There is some evidence that autonomous nervous system reactions may be differentiated by negative and positive emotions and also by different negative emotions, and that hormonal responses vary with different stressful conditions (Lazarus & Folkman, 1984). The behavioral responses to stress explain the physiological response (Steptoe, 1991), too, and there is evidence that individual differences affect the stress process (Cox & Ferguson, 1991; Fogerty et al., 1999; Kivimäki, 1996; Steptoe, 1991). Lazarus and Folkman (1984) and Steptoe (1991) suggest that coping is the major factor causing the physiological response. In monkeys, for example, cortisol secretion appears to depend on the controllability of the situation. Active coping is related to catecholamine release and sympathetic nervous system activation and passive withdrawal to corticosteroid secretion (Steptoe, 1991). Many differences can be found in coping mechanisms, as well as in physiological reactions to stress situation. Personality may influence a person's tendency to use particular coping mechanisms. Steptoe's (1991) view, however, is that because cultural and social context and the situational factors are important, most people cope in similar ways, despite individual differences, (also Havlovic & Keenan, 1995).

There are several stages at which the differences in the stress process may occur. First, as the basic principles of transactional theory assume, when people evaluate situations (primary appraisal) there are several possibilities for divergence (Fogerty et al., 1999; Payne, 1991). Cognitive differences mean that people have different goals and values, so what is stressful for one person, may be totally irrelevant for another (for example, lack of control for someone

who feels responsibility as demanding). The perception of situations may also differ from person to person. Cognitive capacities, cognitive styles or personality traits may mean that a task which is demanding for one is easy for another or is not even recognized as a possible stressor (Cox & Ferguson, 1991; Elovainio & Kivimäki, 1999; Fogarty et al., 1999; Fox et al., 1993; Kivimäki, 1996; Payne, 1991; Sullivan & Bhagat, 1992). The typical conceptualized personality traits studied in the stress process are perceived control, hardiness, locus of control, type A behavior pattern, sense of coherence, self-esteem, negative affectivity and self-focused attention (Antonovsky, 1991; Cox & Ferguson, 1991; Edwards, 1991; Fogarty et al., 1999; Frone et al., 1995; Ganster & Schaubroeck, 1995; Kivimäki, 1996). Social support and job and organizational commitment have also been studied as moderators of stress (Frone et al., 1995; Sullivan & Bhagat, 1992; Vuori, 1993).

In the phase of secondary appraisal a person evaluates his / her capacities in the situation and what possibilities there are to diminish or remove the stress that the situation is causing. In this appraisal the problem-solving abilities and awareness of one's own capacities becomes important. Problem-solving capacities give the person more options to change the environment, and the ability to process information about the situation helps the person to analyze it more accurately. Social competence, in turn, may help the person obtain information from others (Payne, 1991). In the phase of actual coping there are also several ways in which people differ. The tendency to choose certain coping mechanisms is related to personality. For example, those who tend to see things as not controllable often use emotion-focused coping. There is also some evidence that people with less contextual intelligence have a greater tendency to use emotion-focused coping (Payne, 1991). As noted earlier, Steptoe (1991) suggests that coping is more related to social environment. Both verbal abilities and social competence help people to evaluate situations (especially social ones) more accurately and to recognize the important information in another's behavior. These abilities also help people to use social support as a coping mechanism. (Cox & Ferguson, 1991, Payne, 1991.)

The last phase at which individual differences occur is the stress reaction itself. There is evidence that personality factors influence the relationship between stressors and the stress reaction. For example, negative and positive affectivity and hostility have been shown to have direct health effects in addition to their mediating effect via appraisal of situations (Fogarty et al., 1999; Frone et al., 1995; Sullivan & Bhagat, 1992). Personality and individual factors may also have some moderating impact on the relationship between stressors and the stress reaction (Frone et al., 1995).

There may be some vulnerable work environment factors affecting health

independently of cognitive and emotional processes. But objective demands and environments are usually interpreted and evaluated in terms of cognitive and emotional processes. This assumption calls for more understanding of these processes (Lazarus & Folkman, 1984).

Knowledge, goals and cultures guiding the work

Knowledge and information processing are mostly studied in relation to performance and expertise (Glaser & Chi, 1988). But as discussed earlier, they can also be seen as central to the process of stress and job satisfaction. Cognitive theories rely heavily on the assumption that people regulate their actions actively by setting goals and planning their actions according to their own goals and schemes (Cantor & Kihlström, 1987; Frese & Sabini 1985; Neisser, 1991). The relevance of knowledge and goals to performance seems obvious. And if we accept the transactional theories of stress and that goals and schemes vary from person to person, it becomes clear that knowledge and goals have a strong impact on stress. The objectivity of job characteristics also becomes questionable.

Schemes consist of knowledge about a phenomenon, parts of it, links between these parts, and the relationships between the phenomenon and other things (Bargh, 1984; Neisser, 1981). Schemes guide information processing and action planning. According to Cantor and Kihlström (1987), when interpreting a situation, solving a problem or performing tasks a person gathers some relevant information around a central concept from memory. This information forms a fuzzy concept network or a tangled web, as Cantor and Kihlström name it. The network may consist of semantic, declarative and procedural knowledge. At the same time the person tries to find important data in the situation, and compare this to the established knowledge. The information from the situation guides what is being gathered in the concept network. Because of the interaction between environment and schemes knowledge cannot be seen as constant and stable. The meanings of information are given both when retrieving information from memory and when saving and coding information into memory.

When situations are being interpreted, schemes are compared to the real world and, when needed, updated, added, changed or replaced by new ones in order to represent better the actual situation. The schemes are thus in constant interaction between new and old information (Anderson, 1983; Levine et al., 1993). Despite this interaction the knowledge structure can be seen as rather conservative; as the interpretation of situations is based on established knowl-

edge structures, perceptions tend to be stereotypical and people see what they interpret (Fiske, 1993; Fiske & Taylor, 1991).

Lord and Maher have derived some explanations for this kind of false perception. Typically, where the situation does not differ much from the former scheme the information processing is done by fairly automatic, unconscious, routine procedures, and the actions are guided by generalized, routine schemes. When there is something special in the situation, however, conscious information processing begins, although such a shift needs a marked deviation from the normal situation. (Lord & Maher, 1990, 1991). This is related to some general principles of the information processing. In order to make the information processing efficient people tend to construct categories of information. New information is placed into a broader context, within which the situation is explained or interpreted. The choice of which category to place information depends on the goals and the concept network activated. In this choice individuals search for the most informative way to categorize information in view of their goals. This process reduces the number of details, but at the same time intensifies processing (Fiske, 1993; Fiske & Taylor, 1984). Sometimes this categorization may lead to stereotypical information processing.

Social cognitions

Knowledge concerning other people and social situations can be seen as a special case. People try to make sensible interpretations of social situations. Explanations for behavior are sought from what is known about the person involved or about the situation. An attempt is made to form some kind of general picture of the situation. People do not try to memorize the entire situation. According to Black et al. (1984) people try to locate the plot of the situation, meaning the intention or purpose of actions and their consequences. When people read stories they attempt to form causal relationships between things. Even if the story does not consist of these relationships people tend to construct them when they are asked to re-tell the story in their own words. And the more a story consists of causal relationships the better people remember it. Making sense of a situation requires interpreting causal relationships, goals of behavior and the background of the situation. Concrete situations may be stored in the memory as concrete episodes linked together by causal relationships. But they may also be stored at a more abstract level, as interpretations about goals and actions related to them. These interpretations are no longer related to some concrete situation, but are more like principles guiding the interpretation in real situations.

Goals

Goals (or some situational elements) are important factors in choosing the central concept of concept network around which other related concepts are retrieved from memory. These concept networks regulate not only how actions are planned but also the interpretation of situations. Different goals lead to different concept networks, the feedback interpretation alters and the classification and categorization of information varies (Cantor & Kihlström, 1987; Lord & Maher 1991). This may lead to a variety of interpretations of a patient's case, of an event, or even of the entire job.

Goals are seen to organize into hierarchical structures, linked together. At higher levels we may talk about vocational life-tasks or vocational goals, e.g. professional aspirations regarding a nurse's career and how to succeed in it. At lower levels people set more specific goals and plan their actions accordingly (Cantor & Kihlström, 1987; Emmons, 1993). A lower level goal in care for the elderly might be a care plan. In a concrete situation actions would be scheduled according to the care plan and the knowledge the worker has of the patient in question. If the patient was suffering from dementia symptoms her/his care plan might suggest that skills of independent living should be encouraged. Thus when helping the patient to dress, the worker would combine her/his knowledge of dementia, with quality of care, familiarity with the habits and skills of the patient and his/her wishes, and with the non-verbal hints in the situation in assisting the patient to dress as independently as possible.

At workplaces we must remember that goals are of social origin (Hacker, 1985), and to understand people's actions as an outsider is quite difficult. When performing a task a person may be trying to achieve several, maybe contradictory goals (Emmons, 1993). In the example described above some goals derive from the nurse's professional identity, such as how to deal with old people. Some goals are learned through socialization in the organization. A nurse's goal may be to rush through the schedule and complete all tasks, involved in the morning shift. At the same time the nurse may think she should be spending more time on the individual patients, but by hurrying to keep up she is behaving so as to be accepted in her peer group (Bowers & Becker, 1992; Tellis-Nayak & Tellis-Nayak, 1989, compare Hacker, 1985; Lord & Maher, 1991).

In a situation where the pressure of time and keeping to the schedule is relentlessly high, the former plan to encourage the patient's independence in dressing may fall by the wayside. The idea of helping the patient to use her/his skills is easily forgotten and the habits and non-verbal hints are no longer noticed. This kind of situation can create a variety of disturbances in the quality of care received. Firstly, when the goal is to rush through the schedule, also the

higher-level goal and knowledge related to it do not necessarily activate (such as knowledge of care quality). Secondly, under pressure of time information processing becomes rather automatic and the knowledge used in the situation rather stereotypical. It has been noted that episodic knowledge (scripts of certain situations) and declarative knowledge are linked together in rather abstract level of hierarchy in concept network (Gioia & Manz, 1985; Lord & Maher, 1991; Sackmann, 1991). This means that several routine operations may be done using generalized episodes, which do not have links to other forms of knowledge concerning for example dementia symptoms.

Information processing, work organization and culture

In organizations workers tend to share a kind of unanimity of work processes. Lord and Maher (1991) claim that people have some kind of shared understanding, or collective schema on which work is based. Smircich (1983) sees culture as a collection of shared meanings. What is usually emphasized are those meanings members of organization have accepted to be part of their knowledge structures as self-evident parts. Shared meanings are not only seen to guide the work, but also the interpretation of events (Aaltio-Marjosola, 1991; Schein, 1991; Schweder & Sullivan, 1993; Smircich, 1983, 1985).

Thomson and Luthans (1990) explain this kind of unanimous understanding in terms of social learning theory. Employees learn acceptable behavior from the feedback of management and other employees. New employees try to match their behavior to the reality they experience in feedback, in discussion, and watching others. Thomson and Luthans emphasize cognitive processing, where an individual tries to “match behavioral consequence”, which may be understood as connecting new causal relationships, introducing new episodic knowledge to old schemes or totally replacing old schemes totally with new ones. Little by little the culture is transformed and organizational reality evolves (mts., James et al., 1990; Louis, 1990). Gagliardi (1986) also sees the development of organizational processes as a learning process, and regards the role of management as important. Management has a vision which guides how the work is to be done. Workers may have different opinions, but the power of their superiors means they have to implement the management’s ideas. If the methods involved are evaluated as effective, knowledge becomes shared and self-evident. Actions then become automated and the friction which led to new ways is forgotten; work is done in a new way, but the basis behind it is no longer an issue. Translated into the tradition of information processing this means that actions and situations are initially dealt with by conscious information processing, but over time become interpreted using automated processing

and schemes at a fairly high level of abstraction. Action scheme also becomes generalized and automated.

Research in organizational culture has frequently centered on these automated, unconscious meanings or knowledge structures. They may form the most important part of the culture as they are seen to guide the work. These deep structures or higher order schemes are also the key to making profound organizational changes. The problem is that revealing the real knowledge and schemes behind actions is difficult. As Argyris et al. (1990) have demonstrated, the explanations that people tend to have for their behavior are usually only sensible interpretations of their own behavior, and not of the schemes the work is really based on. Some researchers see the revealing of the true schemes as the most important role of culture research (Ashford, 1998).

Cultural diversity

In the organizational culture literature there is some ambiguity between unanimity and diversity of culture (Bartunek & Moch, 1991; Kekäle, 1993; Young, 1991). Culture is usually defined as shared, but as the information processing perspective shows, cultures may be interpreted differently. Diversity in the meanings of events may reflect at least two aspects of organizations: lack of shared culture or existence of subcultures or countercultures (James et al., 1990). Despite apparent unanimity, organizations may be suffering from profound cultural conflicts. Quinn and McGrath (1985) claim that cultures consist of competing values and that this conflict is continuous. In various studies cultures have been shown to have subcultures which may be almost opposed. Different professions have their own ideas about achieving good work, and have different training (the content of which may change fairly rapidly), and subgroups may have their own goals and knowledge (Sackmann, 1992).

The ideas of Thomson and Luthans (1990) show this diversity to be natural. The disparity of previous experiences, goals and knowledge structures used in interpreting situations means that the same event may create totally different perceptions of organizational reality. Although what is acceptable and desirable behavior may be learned similarly, attitudes towards this behavior may differ strongly. In elderly care, for example, workers may learn quickly how patients are treated in the organization, but their views on the matter may well differ. New workers come to an organization with goals and knowledge structures learned in other organizations. Their ways to interpret situations may differ strongly from the interpretations of other workers. Moreover, other workers' messages about the desirable behavior may be conflicting (James et al., 1990; Louis, 1990; Thomson & Luthans, 1990).

James and others (1990) see socialization into work culture and changes in

it as a slow process. Because events are usually interpreted using higher order schemas and values, such interpretations are fairly resistant to re-learning. The stability of interpretation is due to the fact that higher order schemes are abstract and not easily affected by concrete episodes. Moreover the schemes guiding interpretation are used automatically and are derived from values. This does not mean, however, that higher order schemes cannot be changed at all. Values and goals evolve over time and so do schemes.

Relevance of culture and information processing in stress research and job design

What do information processing and the culture perspective have to offer stress research or job design? As with transactional theories of stress these approaches highlight the importance of deeper research into stress and job design. Even if we are able to explore the most severe stressors at a work place, these may have different meanings for the employees. And when trying to implement job design strategies or to reduce stress, we should first strive to understand the cultures and knowledge of the work place in question.

The process by which an employee forms her/his reality of the work environment can be understood as information processing using his/her schemes to interpret events. The key factor in this process is what the employee values as important (James et al., 1990). This means not just the pure cognitive appraisal, but also the significance of events and the emotions attached. What is valued as significant is based on goals. The manifestation of these goals is seen at work, where the goals are put into action. But objective actions do not necessarily reveal individual goals, but rather some culturally formed traditions. Outwardly, work may be accomplished by similar work procedures, but the interpretation of these procedures may differ strongly. Routine activities and regular schedules at work in elderly care institutions may give some employees the feeling that they have the situation under control; when no disturbance occurs they feel that their work day was successful. But other employees may experience such a day as boring and not individualized enough for the old people in their care. This may be seen as threatening their professional identity. Such interpretations of work may also have cultural dimensions. According to Quinn and McGrath (1985) there may be competing values regarding, for example, how old people should be treated or work organized.

When designing tasks or starting a development project, work culture and information processing can have a strong impact. The work organization, physical environment and culture all have a powerful influence on a worker's possibilities when setting goals and planning actions. They may also have an im-

pact on the schemas by which work is guided (Lord & Maher, 1991). For example, control may be regarded as an important tool in the freedom to set goals and the potential to achieve them (Leppänen, 1993). Primary nursing or shared governance model may be seen as arrangements for giving nurses more control. These models are based on the belief that a new model of nursing would enhance workers' knowledge of and responsibility for patients and the continuity of their care.

But control may also be seen as a goal in itself, which strengthens professional identity and autonomous decision-making (Dwyer et al., 1992). Delving deeper, however, may reveal that the meaning of control differs markedly from person to person, which should be taken into account when organizing work. Anderson and Hughes (1993) have shown how experiences differed when the modular nursing approach was implemented at working units. Some people saw the change as a positive challenge, giving freedom and the possibility of caring for patients individually. But others experienced it as a negative challenge; some nurses were resistant to caring for the same clients over an extended period of time. They felt they had lost variety of work (different clients with different illnesses) and faced more problems with 'difficult' clients. Others were satisfied having continuous relationships with clients; for them, the new nursing model expanded the possibilities of achieving their professional goals (Anderson & Hughes, 1993). Outwardly skill utilization, autonomy or task identity may have been equally problematic for both groups of employees, but the practical solution favoured by them would be almost opposite. Those experiencing the change negatively might have preferred to increase the proportion of acute patients in the unit in order to expand skill variety. But for the other group acute patients might make their work more stressful, because concentrating on more numerous problems as individual would be more difficult.

Despite the numerous references to Lazarus' work transactional theories are not incorporated in study designs. Lazarus (1995) demands more thorough research of personal goals and meanings in relation to stress. In Lazarus' theories, stress requires interpretation of the situation and the potential for coping with any stress. Most studies, however, concentrate on statistical relationships between stressors and strain, and personal meanings or goals are seldom examined.

Work in health care and social services

Job design (including job satisfaction, motivation, turnover, absenteeism and quality of work) and stress at work have both been studied in health care and in institutional care for the elderly. However, most research in health care has been done in acute care (Scafefer & Moos, 1996).

Research on job satisfaction has been justified in terms of its links to turnover and quality or performance (implicitly or explicitly) (Blegen & Mueller, 1987; Coward, et al., 1995; Decker, 1997). Turnover has been studied in many professions, but in health care it forms a special problem because continuity in the care process has been seen as an important factor of quality (Anderson & Hughes, 1993; Bostrom, et al. 1994). For this reason it is widely studied, with findings showing that satisfaction affects turnover in health care (Banaszak-Holl & Hines, 1996; Parasuraman, 1989). In some studies, job characteristics like autonomy, authority over one's job, or responsibility have been found to correlate directly with low turnover or absenteeism (Song et al., 1997). The mediating effects have not, however, been explored in most studies. Quality (especially in nursing homes in the American literature) is a rather popular research topic. Quality definitions are fairly broad and vary widely across the research field, and the typical elements of job characteristics or stress are frequently built into the concept of quality (Donabedian, 1988). Because organizational factors can be understood as the structure and resources of quality, it is difficult to determine whether they explain quality or not. Job satisfaction has also been studied as a factor explaining quality, but as noted earlier such an effect has rarely been found (Brannon et al., 1988; Packard & Motowidlo, 1987; Smyer et al., 1991). However, several factors other than job characteristics do explain both job satisfaction and work performance. These include leadership, organizational climate, continuity of staff, education and nursing model, and the functional abilities of patients (Kruzich et al., 1992; Leveck & Jones, 1996; MacGuire, 1991; McNeese-Smith, 1999; Nissen et al., 1997; Sheridan et al., 1992; Teresi et al., 1993).

Job design concepts are seldom implemented in the health care sector as such (Brannon, et al. 1988; Dwyer, et al. 1992; Happ, 1993; Kivimäki, et al., 1994; Smyer, et al., 1991; Song, et al., 1997). Some models of nursing may be understood as means of increasing autonomy and unifying work procedures into a single entity (primary nursing, modular nursing, self-governed teams), although it is also argued that nursing models have developed somewhat differently than in other areas of working life (mts.; Brannon, 1990). And if we take primary nursing as an example, it may be argued that it has developed largely as a consequence of the professionalization of nurses, not in the spirit

of job design (Brannon, 1990). Primary nursing mainly focuses on nurses' work, while the environment of other professions is little considered (Nissen et al., 1997; Teresi, et al., 1993). So-called teamwork in other areas is very close to modular nursing models (Anderson & Hughes, 1993). These models have been linked to positive outcomes for both worker and patient, in terms of increased job satisfaction, self-esteem, autonomy, responsibility (in the positive sense), feedback from patients, continuity, patient satisfaction, reduction of errors and decreased fragmentation. Most findings have been supportive of this approach, but contradictory results have also emerged. The empirical evidence of advantages can also be criticized because of study design; large samples are rare and most investigations have been based on case studies and descriptive analyses, or on samples of a few working units. Another issue is the criteria for whether work is based on functional nursing or primary nursing (Nissen et al., 1997; Teresi, et al., 1993).

Negative outcomes have also been reported in developing the autonomy of workers. In primary nursing the expectations placed on a nurse may be experienced as excessive, and teamwork and co-operation may deteriorate as a result. Modular nursing seems not to raise these particular problems. However, in modular nursing nurses usually care for the same clients longer periods, which may decrease experienced variety at work and strengthen the negative effects of dealing constantly with 'difficult' patients (Anderson & Hughes, 1993; Kivimäki et al., 1994; Nissen, et al., 1997; Song, et al., 1997; Teresi, et al., 1993.) Dwyer and others (1992) suggest that these contradictory results may largely be explained by differences between nurses in their need for autonomy, which they found in their study. Nurses with high need for autonomy were satisfied with primary nursing or shared governance programmes, whereas those with low need for autonomy would be dissatisfied and frustrated in such programmes. In Song et al's study (1997) nurses generally had a high need for autonomy, which may be partly due to the decision making process allowing nurses to observe work done in the same organizational structure they were aiming to develop their own work.

Negative health effects may be one reason for the popularity of stress research in health care. The health care professions tend to appear in lists of occupations with high stress levels. In the health care sector the typical stress outcomes are mental illness, drug / alcohol abuse, burnout and musculoskeletal symptoms (Arnold, et al., 1995; Jensen, 1987; Kinnunen, et al., 1991; Mandel & Lohman, 1987; Sinervo & Lindström, 1992). Stress has also been related to turnover, absenteeism, job satisfaction and quality (Packard & Motowidlo, 1987; Schaefer & Moos, 1996). Packard and Motowidlo showed that subjective stress was related to depression, which, in turn was related to poorer performance.

Typical stressors and factors explaining job satisfaction in health care have been repetitive tasks, routinization, lack of social and economic rewards, problems in supervision, distributive justice, lack of support, cohesion, autonomy or clarity, time pressure, workload, role conflict, problems with clients and unit size (Blegen & Mueller, 1987; Brannon, et al., 1988; Decker, 1997; Dwyer, et al., 1992; Elovainio & Sinervo, 1994; Schaefer & Moos, 1996; Sinervo, 1993; Sinervo & Lindström, 1992; Smyer, et al., 1991; Spore, et al., 1991). Most stressors or demands are typical to almost any job, but the importance of the relationship with coworkers and supervisors, and the demands of clients seem to characterize the difference between health care and other working places. Clients, however, are also the major source of positive feelings. Helping patients is experienced as rewarding and meaningful, although events involving negative influences from patients or families do create distress (Schaefer & Moos, 1996).

One problem in health care research is that the same stressors or demands often explain satisfaction and stress, but to varying degrees one from study to another. This may be partly due to the theoretical ambiguities described earlier: research on satisfaction and stress has been based on distinct traditions, and acceptable combinations of these theories are rare. This is persistent problem in stress research; there are so many ways to measure stress that lists of stressors vary according to the explained variable. Job satisfaction is also measured in several ways. Another possible reason for the divergent findings is that health care or nursing is described as a single entity. But the work environments in different units caring for different types of patient may vary so much that their lists of job demands may have little or nothing in common. The effect of patient characteristics on worker outcomes has not received sufficient study (Chappell & Novak, 1992; Schaefer & Moos, 1996).

Stressors and job demands in care for the elderly

In acute care units patients recover quickly and the feedback from care outcomes is received. But at the same time goals are more difficult to achieve and technical demands are high. In long-term units the work is described as an endless journey, with few positive prospects for the patients. Chronic care requires abundant interpersonal skills because of the intensive relationships between carers and patients (Brannon et al., 1988; Heiskanen, 1987; Landeweerd & Boumans, 1988; Sinervo, 1993).

The typical problems in long-term institutional care for the elderly are poor opportunities for skill utilization, lack of autonomy, repetitive tasks and the stress of caring for chronically ill patients. The functioning of long-term care patients

is poor, and cognitive, emotional and behavioral symptoms of dementia are common. This means that the work consists of many physically heavy and repetitive tasks, while at the same time entailing mental and psychological demands. (Brannon, et al., 1988; Coward, et al., 1995; Schaefer & Moos, 1996; Taft & Cronin-Stubbs, 1995.) On the other hand, the work is characterized as meaningful and rewarding with regard to patient relationships (Schaefer & Moos, 1996). Schaefer and Moos claim that the major problems relate to workload and scheduling, and also to lack of cohesion, autonomy and clarity. There are also problems with supervisors and physicians. But workers do not see the work as unrewarding, nor long-term care as undesirable, as has been claimed in the literature. Schaefer and Moos found that demanding patient care tasks (caring for chronically ill and dying patients, providing support for families) mostly have a positive effect, although these are dependent on adequate staffing and support systems. Work itself is seen as meaningful, but negative emotions of patients cause distress.

Descriptions of work in institutional care vary strongly. For example, the studies of Bowers and Becker (1992) and Tellis-Nayak and Tellis-Nayak (1989) do not give an image of rich and meaningful work. One of the most important goals of workers is hurrying to keep up with the schedule and perform all tasks involved in the shift. Workers may think they should be concentrating more on individual patients, but hurrying up is behavior that they feel will help their acceptance in the group. And in order to be accepted in the group, schedules should not be disturbed (Bowers & Becker, 1992; Tellis-Nayak & Tellis-Nayak, 1989, compare Hacker, 1985; Lord & Maher, 1991).

The effect of patient characteristics and organizational structure on worker outcomes has not been studied widely. Still, as the descriptive studies claim, work with dementia patients in small, specialized units differs clearly from large units with heterogeneous patients (Ahonen & Kiuru, 1989; Davies & Knapp, 1981; Sinervo, 1994; Viljaranta, 1991). Pearlin and others (1990) have made a model among informal caregivers of the effects of caregiver stress. In institutional settings this kind of research is rare (Chappel & Novak, 1992). In some studies caring for persons with Alzheimer's disease is reported to be psychologically more demanding and to cause more stress than caring for physically frail people. In other studies, however, these effects have not been found (Chappel & Novak, 1992). In Pearlin et al's model (1990) characteristics of patients (cognitive functioning, problematic behavior, physical dependency) may have effects on stress, but these are not seen as direct effects, but mediated through some other stressors. Chappel and Novak also concluded that the major stressors were related to work, not to patients.

Pearlin et al's (1990) model supposes that the characteristics of patients

may shape the nature of work, which leads to different stressors. For example, caring for dementia patients in intermediate states consists of assisting and controlling them. This leads to psychological demands like how to deal with mentally ill patients. In bedwards with physically highly dependent patients the work consists of more physically heavy tasks, like lifting and helping patients in toilets and bathrooms, which are often too small and narrow (Sinervo, 1994). Physical structures, unit size and culture may also shape the nature of work, and long-term care may have a variety of potential stressors or characteristics. These factors may affect the level of the cognitive demands of work, or skill utilization, repetitiveness, time pressure, physical load or goal clarity. Work with dementia patients in small, specialized units is rather different from work in bedwards which have some dementia suffers along with physically highly dependent patients.

In elderly care, staff characteristics, as well as those of patients, differ from other areas of health care. Despite the cognitive demands in care for the elderly, the education levels of staff tend to be rather low, and knowledge about mental health, dementia and behavioral disturbances in particular may be inadequate (Bowers & Becker, 1992; Coward et al., 1995; Kanda & Mezey, 1991; Sinervo, 1997; Spore et al., 1991). This may also be a risk factor for workers' well-being; psychological stress may result if workers constantly feel that their skills and knowledge are inadequate and the behavior of certain patients is difficult to cope with.

In Finland the systems used in health center hospitals and residential homes are somewhat different from and not fully comparable with the American system described in most studies. Staffing and patient characteristics in Finnish residential homes may be rather similar to the situation in American nursing homes (Sinervo, 1994; Spore et al., 1991). In the American system nursing homes are described as working places where low-skilled women work with low motivation and low pay in an environment which is impossible to do well in (Bowers & Becker, 1992; Tellis-Nayak & Tellis-Nayak, 1989). Low levels of staff education may prevail in Finnish residential homes, but not in health center hospitals. Low motivation has not been reported in Finnish long-term care institutions, although work is described as impossible to carry out satisfactorily.

Gaps in previous research

There is much international research on the institutional care for the elderly. In Finland, however, despite several development projects and reports not a lot is known about workers' health and work environments particularly in institu-

tional care. In study reports acute and long-term care hospitals have not usually been separated (Tuomi et al., 1988; Sinervo, 1994; Sinervo & Lindström, 1992). It remains to be fully clarified, what are the most severe stressors in institutions, and how satisfied employees are in their job and what explains their satisfaction.

The relationship between stress and job satisfaction is not yet clear. Job satisfaction has its own theoretical framework, but in health care at least it is rarely used. It is obvious that job satisfaction can be explained by the five job characteristics, and also by several other factors. But there is no agreement on the exact nature of the relationship between stress and job satisfaction and between job characteristics and stressors. Job characteristics are defined as more objective than stressors, which are supposed to be strongly affected by cognitive appraisal. But since there is no agreement on this, job characteristics and stressors are both used as predictors of job satisfaction and strain. And agreement is also lacking on whether strain and job satisfaction can be explained by different or the same variables. Sometimes job satisfaction is explained by strain, sometimes by stressors, and sometimes they are seen just as different manifestations of stressors. Even if satisfaction and strain are explained by different variables, the relationship between job characteristics and stressors remains unclear.

Decades of research on stress have still led to no agreement on the relationships and mechanisms linking different stress-related symptoms. There is much variation in symptoms defined as strain, for example, which may be one reason for the mixed results from studies concerning healthy work. One specific area is the research on musculoskeletal symptoms. There is a growing body of evidence that psychosocial factors affect the process by which musculoskeletal disorders develop. One possibility is that psychosocial factors (like control) have effects on physical load. Another is that psychosocial factors influence musculoskeletal symptoms via psychological strain. Psychological strain may have effects on musculoskeletal symptoms via increased muscle tone or some hormonal paths.

In health care, patients can be seen as a source of motivation and satisfaction. But patients' characteristics also have some potential effects on stress and physical load. Patients need help in daily living, which involves physical exertion, but they may also be equally demanding psychologically. Mentally ill patients may be particularly difficult to cope with. The effect of patients on stress has been little studied.

Despite the popularity of the transactional approach in stress research, individual and cultural differences are rarely taken into account. Individual differences are studied, but only as personality factors. Moreover, work may

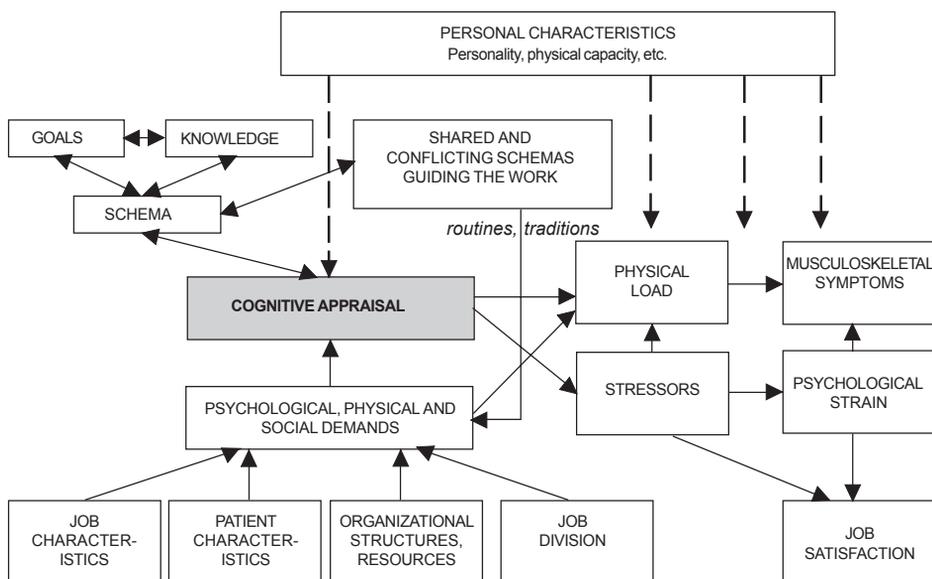


Figure 3. Theoretical framework.

be done using a variety of orientations which lead to totally different interpretations of stress or job redesign. Real attempts to combine cognitive and cultural aspects in stress research are rare. The present study was based on the following theoretical framework (Figure 3).

The aim of the research

This research set out to analyze work in the care for the elderly from different theoretical perspectives. The aim was to create a composite picture of work in institutional care, and its problems. Theoretically the purpose was to analyze the relationships between different theories with a view to enriching the understanding of job design, stress, information processing and organizational culture. In this study these themes are examined in five empirical and one theoretical article.

Studies of work in the institutional care for the elderly are sparse in the international literature and rare in Finland. The first goal in this research was thus to examine workers' well-being and job satisfaction in Finnish institutional care for the elderly, and the nature of the problems involved. (First article.)

The second goal of the research relates to the conceptual vagueness of the two closely related theories of stress and satisfaction. The aim was to discover

whether or not the explanatory variables of stress and satisfaction differ. Another aim was to examine whether different stress-related symptoms are related to similar stressors. (First article.)

In all jobs, job characteristics are understood as objective and important. Stressors, in turn, are understood to result from cognitive appraisal of the objective work environment. The third goal in this research was to explore the relationships between job characteristics and stressors, and whether the level of stressors can be explained by job characteristics. (Second article)

The fourth goal relates to the health effects of stress, especially in the context of musculoskeletal symptoms, which are rather common in Finnish institutional care for the elderly. The aim was to explore the relationships between psychological stress and musculoskeletal symptoms. The effects of stressors are supposed to be mediated via physical load or psychological stress symptoms on musculoskeletal symptoms. (Third article)

The fifth goal in this research relates closely to the fourth goal of musculoskeletal symptoms. The aim was to discover, how patients' functional abilities shape the work and the stressors at work, and the health-related outcomes of stress (Fourth article)

The sixth goal also relates to the patients. As patients are supposed to be the central focus of the work, the aim was to explore more carefully how knowledge about patients guides the work and whether there are any cultural aspects to this knowledge. In the fifth article this is examined empirically and in the sixth article theoretically. (Fifth and sixth article.)

3 Methods

Samples

The research questions were explored using three sets of data: one qualitative data set on the personnel of seven residential homes (in 1992, study 5), one questionnaire data set on the personnel of three residential homes, two nursing homes and two home care organizations (in 1994, studies 1–4) and one data set on patients in the latter care organizations (year 1994, study 4). The questionnaire data on personnel and patients were gathered in a development project before any development action began. The qualitative data were gathered after a development project via interviews of randomly chosen workers.

The questionnaires were delivered to all employees participating in the development project. The 204 respondents represented 82% of all the employees working in the organizations. Thirty-nine were working in the home help or home care organizations of two municipalities, 84 were working on four bedwards of health center hospitals in two municipalities, and 81 on six wards of residential homes in three municipalities. The mean age of the respondents was 41 (SD=9.3) years; 200 out of 204 were women. The mean duration spent working in the current occupation was 11.7 (SD=8.1) years. Half of the respondents (51%) were registered nurses (18), practical nurses (54) or municipal home helps (32), 25% were nursing aides (50) and the rest were managers, head nurses (15), in specialized occupations or kitchen workers (31). The total sample was used in studies 1, 2 and 3.

Study 4 only included staff who could be linked to a particular unit and who worked closely with its patients. For example, managers, kitchen staff and employees working in more than one unit (such as physiotherapists) were excluded. Thus, the final sample comprised 168 employees, of whom 97.6% were women. Their mean age was 41.0 years, 38.2% had over 11 years experience in their current post, 41.1% had 3 to 10 years of experience, and 19.4% had 2 years or less. 41.1% worked in residential homes, 36.3% in health center hospitals and 22.6% in home help services or home care. The largest groups consisted of practical nurses (29.8%), nursing assistants (27.4%) and registered nurses (17.8%). Other major groups consisted of home helpers (10.1%) and head nurses (6.0%).

The functional abilities and dementia symptoms of all patients (464) were

assessed by the head nurses, registered nurses, practical nurses, and home helpers assessed of their unit using a diagnostic form. Functional abilities and dementia symptom variables were aggregated for each unit (mean group scores of the 11 units were analyzed). The mean age of the patients was 80.7 years (SD 9.27). Seventy-five per cent of the patients were women, 33.3% were clients of home help services or home care, 40.3% lived in residential homes and 26.4% in health center hospitals.

The aim of the qualitative study was to describe the knowledge workers had about their clients. It was supposed that this knowledge guided the work – at least partly. The purpose was also to analyze the structure of the knowledge formed. The qualitative data were gathered using a semi-structured theme interview (n=69). Ten randomly selected employees of different occupations (nurses, nursing aides) were interviewed from each of the seven residential homes. The interview consisted of questions concerning the development project which had ended, the changes implemented in the project, their opinions about the project, and lastly questions regarding their knowledge about the clients. Knowledge was divided into descriptive knowledge about clients (What are elderly people like), goals of clients (What kind of goals do elderly people have in residential homes, what do elderly people want of their living in residential homes), and their own goals as employees (What are your goals at work, what is important at work that you are aiming at).

Measures

All measures of work and workers' experiences were based on the same questionnaire, but in each study the items and scales were used in slightly different way. The differences are due to the use of confirmatory factor analysis, and in study 4 to a smaller sample. Descriptive statistics are presented in Table 1 in their original form. In study 1 the scales are used as such. The variations in use of scales or in reliabilities are presented in the text. The reliability estimates (Cronbach's alpha) are presented only for the original scales, because in other articles the confirmatory factor analysis serves several indexes of the goodness of the factor structure.

Job characteristics were measured using six scales derived from Hackman & Oldham's (1976) Job Diagnostic Survey (JDS) (in Finnish, Vartiainen, 1991). In the JDS all the scales consist of three items, one of which is in negative form. In the results job characteristics are presented in positive form. In study 2 only one item (in a positive form) of each scale (skill utilization, autonomy, task identity) was used, because job characteristics was used as a latent vari-

able instead of the subscales. Job satisfaction and growth satisfaction were also measured using the JDS. The overall satisfaction scale consisted of three items, which were all in positive form. The growth satisfaction scale consisted of four scales, all in positive form.

Stressors were assessed using 5 scales: 1) time pressure, 2) patient related stressors, 3) management, 4) interpersonal conflicts, and 5) problems in co-operation or task performance. Descriptive statistics are presented in Table 1. In study 1 the scales were used as such.

In the time-pressure scale items employees were asked whether they agreed or disagreed (1=disagree, 5=agree) with the statements; 1) “there is not enough time to talk to patients,” 2) “schedules are too tight,” 3) “there is not enough time for patients as individuals,” 4) “there is only time for the most important tasks”, and 5) “there are no possibilities for humane treatment” . In study 2 items 2 and 3 were used, and in studies 3 and 4 items 1 – 4. The pool of items included in the questionnaire was developed on the basis of earlier studies conducted among nurses and other health professionals (Elovainio & Sinervo, 1994; Kivimäki & Lindström, 1992; Pöyhönen, 1987).

In the patient-related stressors scale employees were asked whether they agreed or disagreed (1=disagree, 5=agree) with statements such as “the elderly do not understand things”, “.. are distressed”, “.. are nervous”, “.. are in a bad mood”. The scales were based on earlier studies in the health care sector concerning care for the elderly and dementia-related symptoms. These items were used in studies 3 and 4. In study 1 the scale also consisted of statements concerning physical health. In earlier studies these scale scores have found to be associated with psychological stress symptoms, low job satisfaction and sickness absence in employees such as nursing staff (Elovainio & Sinervo, 1994; Kivimäki & Lindström, 1992; Pöyhönen, 1987; Taft & Cronin-Stubbs, 1995).

In the scale concerning management, the employees were asked about their satisfaction with the management of the ward, the management of the organization and its flexibility or bureaucracy. The scale is based on a scale used by Elovainio and Lindström (1993).

The scales of interpersonal conflicts and problems in co-operation and task performance have been used earlier in complete form (Elovainio & Lindström, 1993; Pöyhönen, 1987). In this study the scale was divided into two scales using factor analysis (Sinervo, 1995). In the scale of interpersonal conflict the employees were asked to evaluate the statements: “I can trust people at my work place,” “We have an open climate and feeling of togetherness,” “There is plenty of gossiping and envy at our work place,” “Communication is open at our work place,” and “Most people feel that it is most vital to have good rela-

tionships at the work place”. In the scale of problems in co-operation and task performance the employees responded to the following statements: “Different occupational groups do not get along with each other,” “There is rivalry between working units,” “Interpersonal problems harm working,” “Conflicts in nursing ideologies harm working,” and “Discussion about matters relating to care giving is open”. In both scales, 1=disagree, 5=agree.

Table 1. Questionnaires in original studies and descriptive data.

Study	Scale	Number Of items	Reliability Estimate ¹	Range	Mean ¹	Standard deviation ¹
Job characteristics						
I, II,	Skill utilization	1–3	0.72	1–7	4.20	1.45
I, II	Autonomy	1–3	0.66	1–7	4.98	1.02
I, II	Task identity	1–3	0.59	1–7	4.36	1.39
I	Task significance	3	0.60	1–7	6.09	0.82
I	Feedback from work	3	0.51	1–7	4.87	1.04
I	Interaction	3	0.64	1–7	6.04	0.95
Job satisfaction						
I	Overall satisfaction	3	0.86	1–7	5.59	1.02
I	Growth satisfaction	4	0.75	1–7	4.86	0.96
Stressors						
I, II, III, IV	Time pressure	2–5	0.85	1–5	3.43	0.93
I, III, IV	Patient-related stressors	4–9	0.85	1–5	3.19	0.64
I	Management	3	0.79	1–5	2.82	0.84
I	Interpersonal conflicts	5	0.70	1–5	2.94	0.82
I	Problems in co-operation	4	0.75	1–5	2.56	0.80
Physical load						
I, III, IV	Ergonomic problems	3–7	0.74	1–5	3.41	0.75
Stress or physical symptoms						
I, III, IV	Psychological symptoms	5–6	0.86	1–5	2.48	0.63
I	Psychosomatic symptoms	6	0.83	1–5	1.86	0.68
I, III, IV	Musculoskeletal symptoms	3	0.86	1–5	2.75	1.00
Functional abilities of patients						
IV	Physical functional abilities	12	0.95	1–4	2.84	0.55
IV	Dementia symptoms	20	0.97	1–6	2.01	0.62

¹ Reliability estimates, means and standard deviations of the original, long scales, used in study 1

Physical load was measured by asking employees to evaluate (1=disagree, 5=agree) whether their work involved repetitive, monotonous movements, difficult or uncomfortable positions, or lifting heavy weights (Occupational Stress Questionnaire: Elo, Leppänen, Lindström, & Ropponen, 1992). The scale was

used in complete form in all studies. In previous studies scores have been found to be associated with low back pain in various occupations (Ilmarinen et al., 1985).

Psychological stress symptoms were measured using part of a scale from the Occupational Stress Questionnaire (Elo et al., 1992), which was created and tested by the Finnish Institute of Occupational Health and is widely used. The scale measures subjective stress symptoms such as unusual tiredness, depression, nervousness, difficulty in concentrating, problems in being alert, and feeling that other people are annoying. Employees were asked to evaluate how often they experienced such symptoms (1=never, 5 very often). In studies 3 and 4 the first five symptoms were used.

Psychosomatic stress symptoms were also measured using part of a scale from the Occupational Stress Questionnaire (Elo et al., 1992). The scale measures psychosomatic symptoms: stomach ache, headache, palpitations, dizziness, nausea, and chest pain. Employees were asked to evaluate how often they experienced such symptoms (1=never, 5=very often).

Musculoskeletal symptoms were measured using a three-item scale from a longer scale relating to musculoskeletal symptoms (neck-shoulder and low-back pain) (Viikari-Juntura et al., 1991). Employees were asked to evaluate how often they had experienced such symptoms (1=never, 5=very often).

For the data on patients' functional abilities two scales were used (Study 4). Functional abilities of the patients were measured using two scales relating to activities of daily living (Finnish version) (Laukkanen, Heikkinen, & Ruoppila, 1991.) Employees evaluated how much help patients needed in relation to activities of daily living (1=no need for help, 4=totally dependent on help). Physical activities were defined as eating, dressing, bathing, moving indoors, moving outdoors, and using the toilet. Instrumental activities were defined as cleaning, cooking, doing light housework, taking medicine, performing simple administrative tasks, and using public transport systems. Results using the two scales were combined (12 items, Cronbach's alpha in this study .95).

Dementia symptoms were measured using three scales designed for use in connection with long-term care (GBS-scale, Gottfries et al., 1982). Employees evaluated the existence of symptoms (1=normal, 6=serious problems). Cognitive symptoms were measured via a 12-item scale: orientation in relation to place, time and self, short-term and long-term memory, sleeping problems, ability to hurry, concentration, alertness, absent-mindedness, verbal communication, and reactivity. Emotional symptoms were measured via a three-item scale: emotional reactivity, stability of emotions and motivation. Behavioral symptoms were measured via a five-item scale: irritability, anxiety, distress, mood, and restlessness. Results using the three scales were combined (20 items,

Cronbach's alpha in this study .97). Descriptive statistics relating to variables used in the study are shown in Table 1.

Statistical analyses

In all studies the reliability (homogeneity) of scales was analysed using Cronbach's alpha coefficient. Studies 2 – 4 also used confirmatory factor analysis, to test the relationship of the observed variables to the latent variables they were supposed to measure (LISREL 8, Jöreskog & Sörbom, 1993a). Confirmatory factor analysis estimates how well the items measure the assumed factor structure. The first step, measurement model testing, related the observed variables to the underlying theoretical constructs (latent variables) by means of confirmatory factor analysis (the results of the measurement models are presented in Table 2).

Table 2. *The measurement model tests in studies 2, 3, and 4.*

	χ^2	DF	p-value	RMSR	AGFI	BBI	TLI
Study 2	24.72	17	0.10	0.047 ^(RMR)	0.97 ^(GFI)	0.96 ^(NFI)	-
Study 3	249.44	142	0.00	0.058	0.85	0.86	0.92
Study 4	40.31	39	0.41	0.034	0.94	0.96	1.00

In Study 1 the differences between working units and occupations were studied using t-tests in pairs (TTEST-procedure in SAS-program) and a Chi Square coefficient. Factors relating to job satisfaction and strain (including symptoms of musculoskeletal disorders) were studied using regression analyses (GLM-procedure).

In Studies 2, 3 and 4 the hypotheses were tested using confirmatory factor analysis (LISREL 8 Joreskog & Sorbom, 1993). While in the first step the observed variables are linked to latent, theoretical variables, the second step tests how well the alternative structural models fit the data (Anderson & Gerbing, 1988). The efficacy of the alternative structural models is tested using a goodness of fit index (χ^2 -test). In principle, a nonsignificant χ^2 -test would signify that the data provided a good fit to the model. Because the goodness of fit test is sometimes problematic with large samples (Hayduk, 1989), some additional statistics are also provided to describe the adequacy of a model. These include the root mean square residuals (RMSR), the adjusted goodness of fit (AGFI), Bentler and Bonett's normed fit index (BBI), the Tucker-Lewis index (TLI), and the comparative fit index (CFI). The smaller the RMSR and the greater

the AGFI, BBI, TLI, and CFI, the better the model fit. The range of these indices is from 0 to 1. The Tucker-Lewis index is the only one that is relatively independent of sample size (Marsh, Balla, & McDonald 1988).

In Study 4 the sum scales of the original scales were split into two sum scales in order to minimize error in the analysis (stated as A- and B- variables in Figure 8). Doing this made it possible to count the error of the latent variables (Anderson & Gerbing, 1988). The sum scales and the split sum scales, means, standard deviations and correlations between the scales are shown in original Study 4.

Qualitative analysis

Interviews were recorded and transcribed. Categories were derived from the text, which was coded using the Textbase Alpha –program. The analysis can be seen as a phenomenographic analysis (Marton, 1981), the aim being to establish the categories that descriptions can be divided into, and to interpret them. The first task was to discover the concepts employees had about the clients and about the work. After coding the answers into these categories the data were quantified. The result was 45 dichotomous variables; each category was a variable describing whether or not the participant had used the category in the interview. The aim was not to evaluate the frequency of categories, but to analyze the knowledge structure categories formed (Siehl & Martin, 1988). The structure of categories was studied using the correlations (Spearman) between them. The correlations describe the probability of use of a category if another category was used.

4 Results

Work in care for the elderly

In the study of work and well-being in care for the elderly a clear distinction can be made between home care and institutional care (Study 1). In home care almost all the factors studied were more positive than in institutional care. Only interaction with other people was lower than in institutional care (but still high), whereas satisfaction with management was lower and problems with co-operation (in task distribution) were more frequent than in institutional care. Following the ideas of Hackman and Oldham (1976) job characteristics in home care approached the optimal situation. Moreover, the stressors were at a significantly lower level than in institutional care. This can also be seen in stress reactions, where physical and psychological strain were lower, although psychosocial strain was interestingly higher than in institutional care. This may be due to problems in co-operation.

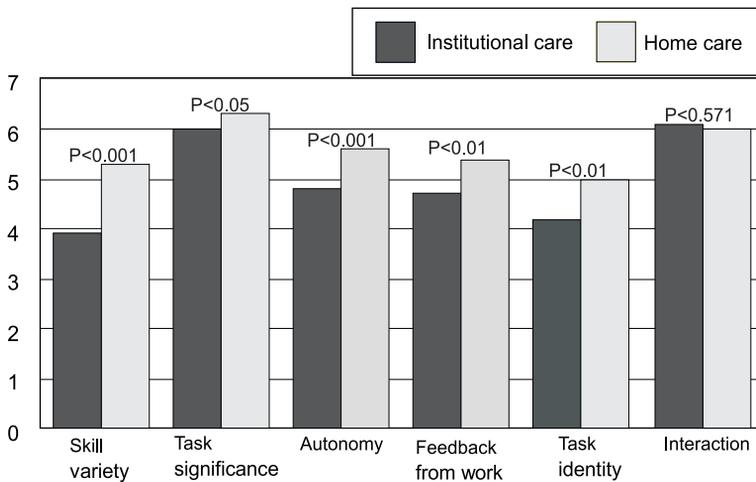


Figure 4. Job characteristics in long-term care institutions and home help services.

In institutional care the possibilities for skill utilization, autonomy, feedback and task identity were low. Of the stressors, ergonomic problems, time pressure and patient-related stressors were high. Health center hospitals and residential homes were almost identical. Only patient-related stressors were sig-

nificantly higher in residential homes. Smaller differences were that in health center hospitals time pressure, ergonomic problems and interpersonal and co-operation problems were higher, and workers had more physical symptoms than in residential homes. In both institutions musculoskeletal symptoms were very common: more than 40% of workers in health center hospitals had suffered from neck and shoulder pain frequently. Unusual tiredness was also common (25% of workers in both institutions).

Health center hospitals and residential homes seemed similar when occupations were not compared. But when nurses and nurses' aides were compared with each other and with the same occupation in the other type of facility, several differences were found. The work of nurses' aides in health center hospitals was perhaps the most problematic. They had rather poor scope to use their skills, feedback from work was low, ergonomic problems and time pressure were high and patients were experienced as the most demanding. Problems with co-operation were also frequent. Musculoskeletal symptoms were very common as were other symptoms. Compared to nurses in health center hospitals, however, there were two positive things. The autonomy of nurses' aides was pretty high, and their task identity was good.

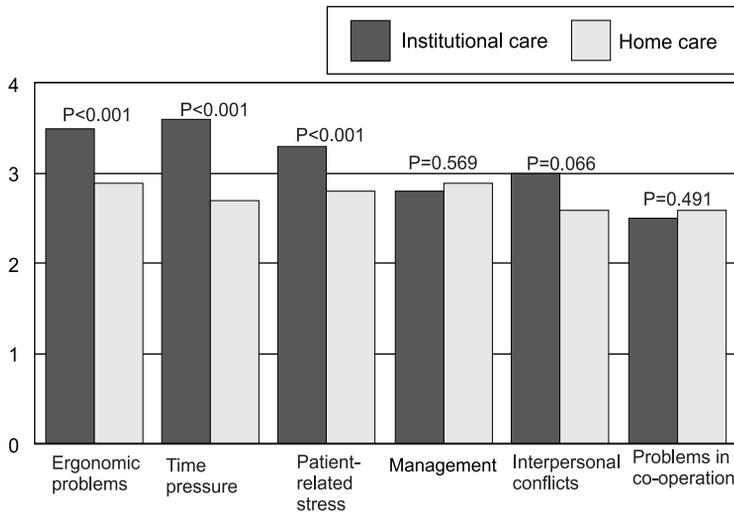


Figure 5. Stressors in long-term care institutions and home help services.

In residential homes nurses' aides had greater opportunities for skill utilization (still rather low), and their feedback from work was better, but task identity lower. Stressors were the same and rather high, but not as high as in health center hospitals. Problems with co-operation were less frequent.

In residential homes nurses' skill utilization was even worse than in health

center hospitals and they also found clients more demanding. In health center hospitals time pressure was higher and ergonomic problems more frequent. The nurses in health center hospitals also had more psychosomatic stress symptoms and musculoskeletal symptoms.

Table 3. Job characteristics, stressors and well-being in residential homes and health center hospitals by profession. Significances of T-tests in pairs.

	1) Health center hospital nurses n=47	2) Health center hospital nursing aides n=12	3) Residential homes nurses n=20	4) Residential homes nursing aides n=38
Job characteristics				
Skill variety	4.01 (1–2**)	3.00 (2–4*)	3.45	3.72
Task significance	6.01	5.86	6.27	6.04
Autonomy	4.76	4.87	4.52	4.90
Feedback from work	4.82	4.36	5.10	4.68
Task identity	3.90	4.71	4.26	4.25
Interaction with others	6.32 (1–2****)	5.05 (2–4**)	6.45	6.11
Job satisfaction				
Overall satisfaction	5.35	5.36	5.15 (3–4*)	5.77
Growth satisfaction	4.51	4.88	4.32	4.81
Stressors				
Time pressure	3.91 (1–3*)	3.67	3.36	3.57
Patient-related stressors	3.10 (1–2*,1–3*)	3.52	3.43	3.54
Management	3.12	2.45	3.05 (3–4*)	2.59
Interpersonal conflicts	3.02	3.47 (2–4*)	3.08	2.94
Problems in co-operation	2.66	2.64	2.60	2.17
Physical load				
Ergonomic problems	3.76 (1–2*)	4.11 (2–4*)	3.51	3.61
Stress or physical symptoms				
Psychological symptoms	2.56	2.51	2.55	2.45
Psychosomatic symptoms	1.91	2.08	1.77	1.93
Musculoskeletal symptoms	2.86 (1–2*)	3.61 (2–4*)	2.63	2.86

*p<0.05, **p<0.01, ***p<0.001

Stressors and factors explaining job satisfaction and strain

Factors explaining stress and job satisfaction were studied (in Study 1) using five regression models, one for each strain or satisfaction variable (Table 2). Strain was studied as musculoskeletal symptoms, psychosomatic symptoms and psychological symptoms. Musculoskeletal symptoms could be explained only by ergonomic problems, and only 10% of variation could be thus explained. Psychosomatic symptoms could also be explained by ergonomic problems, but also by problems in co-operation (concerning task performance and task distribution) and by lacking feedback from work. Psychological strain could be explained by time pressure, problems with co-operation (concerning task performance and task distribution) and by autonomy. Thus, different strain vari-

Table 4. Regressions of stressors and job characteristics onto well-being.

Explaining variable	Overall satisfaction		Growth satisfaction		Psychological symptoms		Psychosomatic symptoms		Musculoskeletal symptoms	
	Estimate	t-value	Estimate	t-value	Estimate	t-value	Estimate	t-value	Estimate	t-value
Ergonomic problems							0.149	2.45*	0.418	4.69***
Time pressure			-0.183	-3.29**	0.138	2.98**				
Management	-0.284	-3.31**	-0.323	-5.38***						
Interpersonal conflicts	-0.301	-3.32**								
Problems in co-operation					0.169	3.30**	0.140	2.46*		
Skill variety	0.160	2.95**	0.211	5.20***						
Autonomy	0.155	1.97*	0.137	2.33*	-0.120	-2.81**				
Task significance			0.279	4.45***						
Feedback from work							-0.138	-3.14**		
F-value	DF=4	21.14***	DF=5	40.01***	DF=3	14.06***	DF=3	9.78***	DF=1	21.95***
R²		0.298		0.502		0.174		0.128		0.098

*p<0.05, **p<0.01, ***p<0.001

ables had their own stressors as explaining variables. The more the variables were psychologically based, the more explanation work-related factors could offer (13% of psychosomatic symptoms and 17% of psychological symptoms).

Job satisfaction was studied as overall job satisfaction and as satisfaction with personal growth and the challenges at work. Overall satisfaction was explained by satisfaction with management, problems in human relations, skill utilization and autonomy (30% of variation). Growth satisfaction was explained by time pressure, satisfaction with management, skill utilization, autonomy and task significance.

Job characteristics and stressors

In Study 2 it was supposed that by organizing work according to the principles of Hackman and Oldham (1976) the level of stressors may be reduced. As time pressure and ergonomic problems seemed the most severe problems in the care for the elderly, they were explained by the job characteristics most closely related to the design of work (skill variety, task identity and autonomy). Two nested models were tested using confirmatory factor analysis (LISREL). In the first model job characteristics explained both time pressure and ergonomic problems. The second model was identical, except that time pressure also explained ergonomic problems.

The results (Figure 6, Table 5) showed that job characteristics were significantly related to both time pressure and ergonomic problems. In addition, the model where time pressure also explained ergonomic problems turned out to

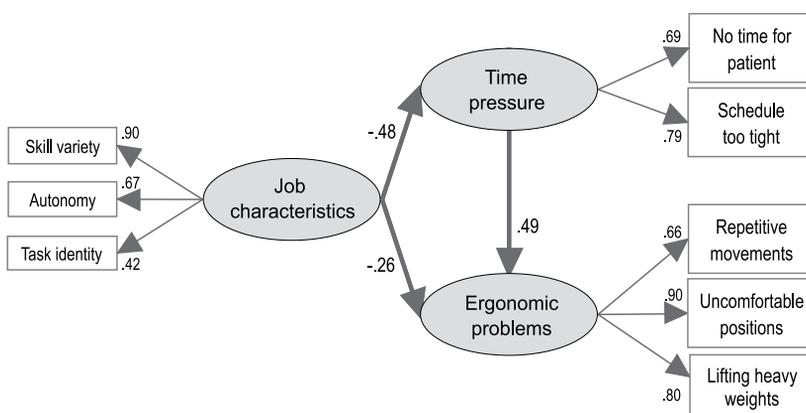


Figure 6. Confirmatory factor analysis of job characteristics, time pressure and ergonomic problems (model 2).

fit the data best. Choosing the more complex model was supported because the difference between Chi Squares was significant and the fit indices were better and the residuals smaller. In the model job characteristics explained 24% of the variation of time pressure. Time pressure and job characteristics explained 43% of the variation of ergonomic problems. The models thus supported the hypothesis that a well-designed job can reduce time pressure and ergonomic problems. The results also supported the idea that psychosocial factors at work have an effect on physical load (compare Figure 3).

Table 5. Goodness of fit test and fit indices for the tested models.

	χ^2	DF	P	RMR	GFI	NFI
Model 1.	50.08	18	0.00	0.094	0.94	0.91
Model 2.	24.72	17	0.10	0.047	0.97	0.96

Stress and musculoskeletal symptoms

Study 2 revealed one probable pathway by which psychosocial factors affect physical load and thereby probably have a mediated effect on musculoskeletal symptoms. This mediation effect was, however, not studied. Only the relationship between psychosocial factors and physical load was supported. Study 3 explored more carefully the pathways of how psychosocial factors relate to musculoskeletal symptoms. Psychological stress symptoms and musculoskeletal symptoms were also involved. Unlike Study 2 this study concentrated on stressors, and job characteristics were not included. Patient-related stress has been discussed in several studies. Patients have been mentioned as a source of meaningfulness at work, but at the same time ‘difficult’ patients are one reason that employees do not work regularly with the same patients. Patients are also a source of physical load – they are simply heavy to move.

In Study 3 two possible pathways relating psychosocial stressors (time pressure and troublesome patients) to musculoskeletal symptoms were studied (Figure 7). Firstly, psychosocial stressors were supposed to be related to physical load (ergonomic problems) and from there to musculoskeletal symptoms. Secondly, psychosocial stressors were supposed to be related to psychological stress symptoms, which are related to musculoskeletal symptoms. In this study three nested models were tested using confirmatory factor analysis (LISREL). In the first model psychosocial stressors were associated with physical load and psychological symptoms. Physical load was associated with musculoskel-

etal symptoms (Physical load mediator model). In the second model psychosocial stressors were associated with psychological symptoms (and not to physical load), and psychological symptoms with musculoskeletal symptoms. Physical load was also associated with musculoskeletal symptoms (Psychological stress symptoms mediator model). In the third model psychosocial stressors were associated with both physical load and psychological symptoms, and both physical load and psychological symptoms were associated with musculoskeletal symptoms (Two mediators model).

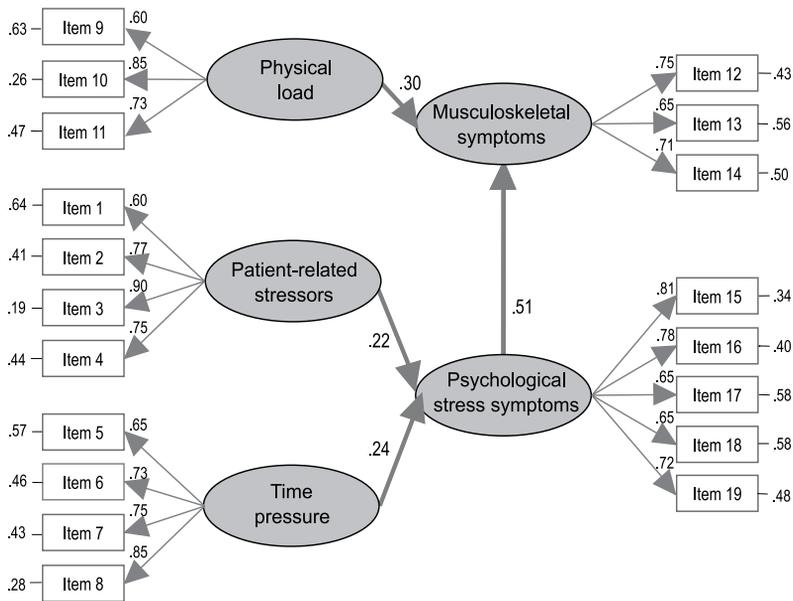


Figure 7. Psychological stress symptoms mediator model.

The psychological stress symptoms mediator model and the two mediators model both fit the data rather well (Table 6). Because there was no significant difference between them the simpler model should be chosen (Anderson &

Table 6. Goodness of fit test and fit indices for the tested models.

	χ^2	DF	RMSR	AGFI	BBI	TLI
1 Psychological stress symptoms mediator model	251.08	145	0.059	0.85	0.86	0.92
2 Physical load mediator model	291.02	146	0.091	0.83	0.84	0.89
3 Two mediator model	251.08	145	0.059	0.85	0.86	0.92

Gerbin, 1988). Thus, the hypothesis of the mediating effect of psychological stress symptoms between psychological stress and musculoskeletal symptoms was supported.

Functional abilities of patients and worker stress

Study 4 aimed to answer the question of how the functional abilities of patients relate to stress, physical load and musculoskeletal symptoms. The basic assumption is that patients' functioning shapes the nature of work, which can be noticed in stress and physical load at work. Two hypotheses were tested. In the first hypothesis it was supposed that functional abilities of patients affect the physical load of work, which generates musculoskeletal problems for caregivers. In this hypothesis it is supposed that when patients' functioning becomes low, s/he needs more help with basic functions involving physically heavy tasks and difficult positions, such as when lifting patients or helping them in toilets. In the second hypothesis it was assumed that functional abilities of patients affect psychosocial stressors (patient-related stressors and time pressure). These stressors are associated with psychological stress symptoms, which in turn affect musculoskeletal symptoms.

Several nested models of confirmatory factor analysis were tested, but the four best ones were presented. In all of the models both psychological stressors were related to psychological stress symptoms, psychological stress symptoms to musculoskeletal symptoms and physical load to musculoskeletal symptoms. The relationships between functional abilities of patients, stressors and physical load varied. In the first three models functional abilities of patients were not related to physical load. In the first model time pressure (Time pressure mediator model) mediated the effect of patients' functioning on psychological stress symptoms. In the second model patient related stressors (Patient-related stress factors mediator model) mediated this effect. In the third model both stressors mediated the effect (Psychosocial stress factors mediator model). In the fourth model patient related stress factors mediated the effect of patient's functioning on psychological stress symptoms, and physical load mediated this effect on musculoskeletal symptoms (Two mediator model).

The fit indices showed that the Patient-related stress factors mediator model fitted the data best (Table 7). The Time pressure mediator model also fitted rather well, but there were significant differences between models. Thus it was evident that the functional abilities of patients affected patient related stressors. The hypothesized mediated effect of psychosocial stressors between functional abilities of patients and psychological stress symptoms was partially

supported. The effects of patients' functioning on time pressure or physical load were not clear. The bivariate correlations make it clear that the functional abilities of patients are also related to physical load and time pressure. But when all these relationships were combined, the effect of patients' functioning on patient-related stressors, and thereby on psychological strain and musculo-skeletal symptoms, became strongest.

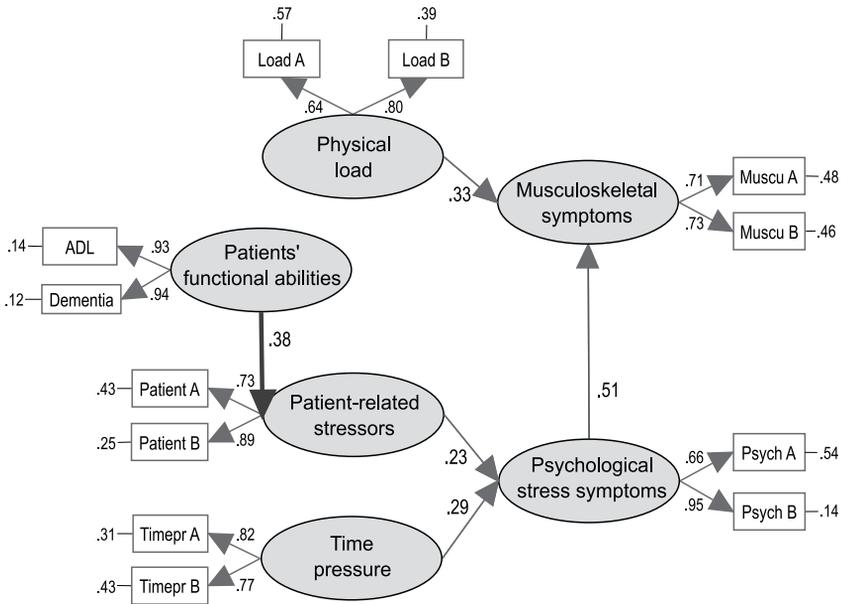


Figure 8. Patient-related stress factors mediator model.

Table 7. Goodness of fit test and fit indices for the tested models.

	χ^2	DF	p-value	RMSR	AGFI	BBI	TLI
1 Time pressure mediator model	64.17	46	0.0390	0.058	0.92	0.94	0.97
2 Patient-related stress factors mediator model	59.08	46	0.0930	0.059	0.94	0.94	0.98
3 Psychosocial stress factors mediator model	76.15	47	0.0045	0.070	0.90	0.93	0.96
4 Two mediator model	76.15	47	0.0045	0.070	0.90	0.93	0.96

Shared or conflicting understanding of work

In Study 5 knowledge and goals concerning elderly people and work in the institutional care for the elderly were studied using qualitative data. The first aim was to examine the kind of constructs employees use to describe elderly people and the goals or needs of the elderly in institutions. The second aim was to disclose the kinds of goals workers had in their work. The third aim was to discover what kinds of structures this knowledge forms. The fourth aim was to reveal whether a unanimous culture or cultural conflicts are to be found in the institutions in terms of the knowledge structures of work and elderly people.

The constructs describing elderly people could be divided into five categories: constructs describing the need for help, physical frailty, dementia symptoms, personality or social relationships, and behavior. Descriptions mainly concerned the problems and illnesses of elderly people. Personal and social aspects were less common.

The goals or needs of elderly people were divided into eight categories: meaningfulness of life, relaxation / peace, close relationships / company, humane treatment, basic services when needed, safety, full service environment (like living in a hotel), and no goals.

Goals at work were divided into ten categories, which were further organized into one main category (well-being of the elderly) and three subcategories (content of work, ideology or style of care taking, and work environment). Psychological support / social relationships with elderly clients, practical nursing, cleaning and other goals relating to one's own work belonged in the first subcategory. Humane treatment, individuality and carefulness with tasks belonged in the second subcategory, and the climate of the working group and well-being of workers in the third.

Studying the relationships between constructs showed that no shared, unanimous concept network could be found, and neither any subcultures based on occupations, wards or age groups (except the goals particular to occupations). When studied using correlations, however, some structures were found (Figures 9 and 10) relating to negative and positive views of elderly people. In negative views of elderly people knowledge was fragmented and based on perceptions of their dependency, need for help, physical frailty or dementia symptoms. There were no positive correlations to other parts of the concept network. On the contrary, when elderly people were described under the category need for help, meaningfulness of life or close relationship / company as a goal of elderly people was seldom mentioned. Individuality of patients was also an uncommon goal of work. Moreover, when humane treatment was mentioned as a goal of elderly people, they were not seen as wanting compre-

hensive service as if they were living at a hotel. Such views of the elderly can be interpreted as being related to the functional nursing model, where caring for elderly people is divided into small, separate tasks. In this model it has been noted that taking care of physical needs is emphasized at the expense of psychological and social needs.

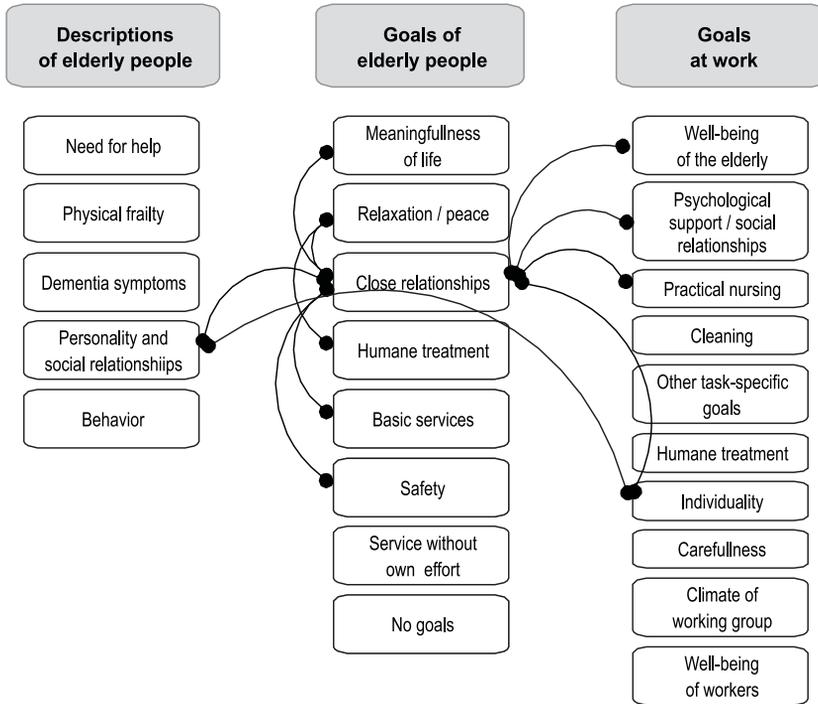


Figure 9. Concepts guiding work in residential homes. Positive correlations between concepts.

The positive view also included personal or social aspects of behavior in the concepts. When these aspects were included in the characterization of elderly people it was also usual to describe their needs or goals using the category close relationships / company, as well as individuality as a goal of work. It also seemed that the concept network was more coherent than with the negative view (see more details in Sinervo, 1994). In this network category close relationships / company could be defined as a central concept of the network. Of the goals of elderly people, meaningfulness of life, relaxation / peace, close relationships / company, humane treatment, basic service when needed, and safety were related to this concept, and of goals at work, well-being of elderly people, psychological support / social relationships, practical nursing and individuality. Most of these concepts were also related to a more flexible and

deeper concept network (Sinervo, 1994). As was earlier noted, concepts with in this network were not related to a negative view of elderly people. For example, when social and psychological aspects of patients were included in descriptions or goals of elderly people they were not usually described as dependent and in need of help. Of course, the context of the study meant that physical frailty or dementia symptoms were also used when describing the elderly.

What can be concluded is that there was no unanimity about the goals and views of old people. Rather, work was done under conflicting knowledge structures. The work culture in institutions seemed to be based on negative views of the elderly as passive receivers of help (results described in Sinervo, 1997). There were also signs of an individually oriented work culture emerging, but it did not yet predominate.

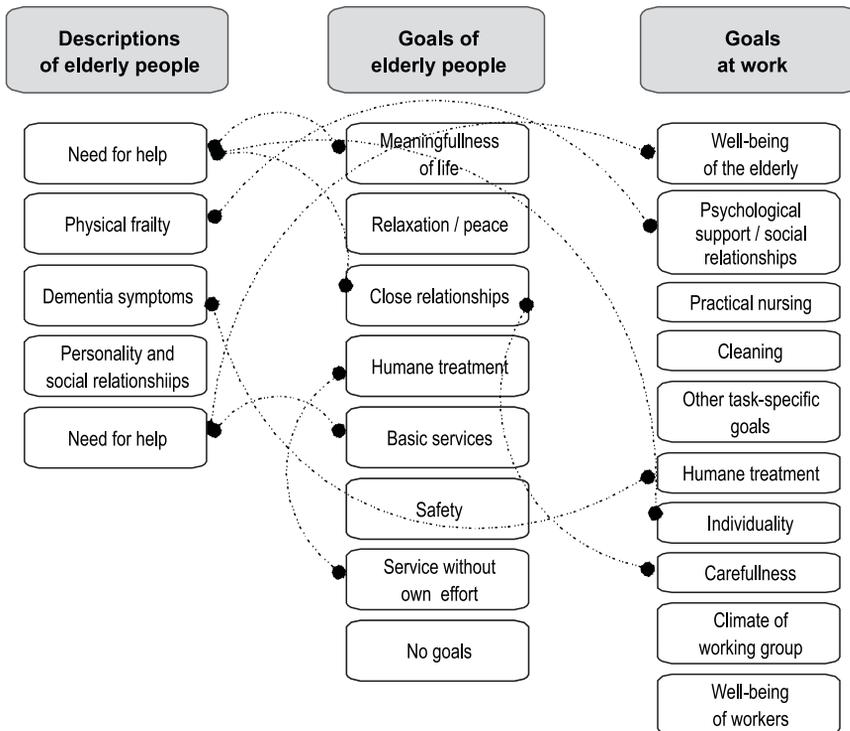


Figure 10. Concepts guiding work in residential homes. Negative correlations between concepts.

Summary of results

Institutional care for the elderly was ascertained to be demanding both psychologically and physically. Home care was also regarded as strenuous, but there was a clear contrast between home care and institutional care. The most severe problems in institutional care were ergonomic problems, time pressure and patient-related stressors. Stress symptoms were very frequent. Factors related to job satisfaction were also problematic in institutional care. Work can not be characterized as motivating in terms of job design theories. Possibilities to use skills were low, work was experienced as fragmented, and autonomy and feedback were relatively low. In home care, on the other hand these were not problematic. In institutions there were several differences between occupations. The work of nurses' aides in health center hospitals was regarded as especially strenuous and non-motivating. Musculoskeletal symptoms were particularly frequent.

Stress symptoms could be explained mainly by separate stressors. Musculoskeletal symptoms were explained by ergonomic problems, and psychosomatic symptoms by ergonomic problems, difficulties in co-operation and the lack of feedback from work. Psychological symptoms were explained by time pressure, problems in co-operation and lack of autonomy. Job satisfaction measures also had separate explanatory variables from stress symptoms. Overall satisfaction was explained by satisfaction with management, lack of problems in human relations, skill utilization and autonomy. Growth satisfaction was explained by these variables (except problems in human relations) and time pressure and task significance.

The study found some evidence that well-organized work may decrease the level of time pressure and physical load. Job characteristics (skill utilization, autonomy, task identity) could explain a large part of the variation of time pressure and physical load. Physical load (ergonomic problems) was explained not only by job characteristics but also time pressure. It is thus possible to differentiate between job characteristics and the stressors which are based on cognitive appraisal.

Musculoskeletal symptoms turned out to be related to psychological stress and stressors. This could indicate that psychological stressors have their effect on musculoskeletal symptoms mediated via psychological stress symptoms. On the other hand, the mediating effect of physical load could not be shown, although it was earlier noted that time pressure and job characteristics have an effect on physical load. However, the results showed that the model in which this effect was included fitted as well as the simple model. It is thus probable that this effect also has significance.

Patients' functional abilities and dementia symptoms were related to both physical load and psychological stress. In this study, however, the model showed that the effect of patient characteristics was mediated via experienced patient-related stress and psychological stress symptoms on musculoskeletal symptoms fitted best the data. It is evident that patient characteristics also shape the work physically. But it was clearest of all that workers' cognitive evaluations of patients have a stronger impact on musculoskeletal symptoms via psychological stress symptoms.

Elderly people were most often described as needing help or as physically or mentally ill. Personal and social aspects were less common. Concepts describing patients' needs were much more often related to psychological and social needs. The goals at work were also related to psychological and social aspects. The concept network could be divided into two cultural entities. The first one was rather fragmented and concentrated on descriptions of need for help or of illnesses. There were usually no clear relationships to other parts of the concept network. On the contrary, when the view of elderly people was based on dependency or illness social relationships or meaningfulness of life were seldom seen as needs of elderly people, nor individuality and social and psychological support as a goal at work. The other concept network was based on social and personal aspects of elderly people. When elderly people were described using these aspects there were connections to other parts of the concept network, like individuality as a goal at work. It also seemed that patients' needs served as a central concept of this network embracing practical nursing, social relationships, meaningfulness of life, humane treatment, basic services and safety. Thus it appears that work in institutional care was guided by conflicting – not shared – knowledge and goals.

5 Discussion

In the six articles this study was based on, the aim was to analyze work in the care for the elderly from the perspectives of job design, stress, expertise and organizational cultures. Results are based on questionnaire data gathered from employees in six residential home units, four bedwards in health center hospitals and two home help organizations. Data concerning functional abilities of patients were also gathered from these units. Qualitative data were gathered by interviewing employees in seven residential homes.

The results showed that work in the care for the elderly is rather demanding both psychologically and physically and does not motivate workers from the viewpoint of job design. Job satisfaction, psychological stress and musculoskeletal symptoms could be mostly explained by separate factors. However, several possible links were indicated between stress and satisfaction and cognitive and cultural aspects. Work was found to be done on the basis of conflicting values and knowledge, which may be reflected to stress and satisfaction.

Theoretical considerations

The theoretical aim in this research was to use theories of job design, job satisfaction, stress, information processing and organizational culture to analyze work in the care for the elderly. Theories from different traditions were used to reveal the critical points at work, rather than a single theory such as stress theory. The aim was also to analyze whether different traditions can improve understanding of the theories used.

Stress and job satisfaction

There are several possible connections between stress and job satisfaction. Firstly, the antecedents of stress and job satisfaction – stressors and job characteristics – may be related. Theoretically, stressors are a result of cognitive appraisal, while job characteristics are more objective, not as heavily linked to appraisal (Hackman & Oldham, 1976). This has, however, been problematic. There is evidence for both assumptions, especially concerning control. There have been doubts that social cues and personality can affect the perception of

job characteristics (Blau & Katerberg, 1982). But there is also evidence that control measured by questionnaires is strongly related to more objective measurements of control and that there is variance in control between working places and not only between individuals (Spector, 1992; Söderfeldt et al., 1997).

This research explored the question of whether job design – high level of job characteristics – can reduce the level of perceived stressors. This implies that job characteristics should not be treated as a similar phenomena to stressors (compare Frese, 1989; Karasek, 1989). In this study autonomy, opportunities to use skills and task identity were related to time pressure and ergonomic problems. It is probable that when employees can deal with entire working processes (not only narrow pieces) and are able to plan their actions, time pressure is lower; work involves less haste just to get jobs done, and it is possible to set priorities between tasks. There are some examples of this (Ahonen & Kiuru, 1989; Sinervo, 1997). Shifting from large units to smaller ones helps workers to concentrate on each patient individually. Personal habits are learned more easily and it is possible to schedule the work to allow time to rest between heavy tasks. Much time pressure probably stems from fixed schedules that workers cannot affect. According to this study, however, it is not possible to know whether job design has an effect on objective stressors or on the perception of stressors (mts.)

The second question concerning job satisfaction and stress relates to their antecedents. It is not disputed that job characteristics explain job satisfaction, and this research provided further confirmation. But several studies have shown that job satisfaction seems to be related to more than just job characteristics (Algera, 1990; Parasuraman, 1989). Job design is thus not a sufficient theory to explain the phenomenon of job satisfaction. Some factors considered as stressors also have an impact on satisfaction, so clearly there are relationships here, too.

Stress and satisfaction were mainly explained by different variables. Physical and psychosomatic symptoms had no common explanatory variables with satisfaction factors, and none of the variables of the JDS-model – except feedback – explained psychosomatic or physical symptoms. But psychological symptoms had several explanatory variables in common with job satisfaction. It is obvious that task characteristics are less important when it comes to symptoms of somatic health, whereas for psychological symptoms autonomy is important. It seems that to have an effect on somatic health some kind of appraisal of work-related factors is needed. As the transactional stress theories suppose, to become stressful situations are interpreted as a challenge or threat (Lazarus & Folkman, 1984). This is interesting because several studies have found direct relationships between control and health (Bosma et al., 1998a, b).

What was not examined in the present study was the possible interaction effect of autonomy (or control) with stressors on health.

In conclusion, the findings of this study could only suggest that job satisfaction and stress symptoms do not have the same origin; or at least that stress symptoms and job satisfaction mainly have separate antecedent factors. Thus, if satisfaction is seen as one outcome of stress, stress cannot be seen as a single phenomenon, and different stressors have different outcomes.

There is evidence of the relationship between stressors and satisfaction. But whether stress symptoms are antecedents of satisfaction or whether satisfaction has an impact on stress symptoms could not be answered in this research. Moreover, it is possible that satisfaction operates as a mediating factor in the relationship between stressors and strain. This study could not address these questions.

In relation to stress symptoms, this study appears to reveal that stress reactions are not a function of a single phenomenon (Lazarus, 1993). Different stressors were related to different stress reactions. Psychological and psychosomatic symptoms had only one common variable: problems in co-operation; psychological symptoms and musculoskeletal symptoms had no common variables. According to this study it is also obvious that several other explanatory variables exist, because the variables studied explained only 9 to 17% of strain. The possible effects of job satisfaction on stress, or vice versa, or the effects of psychological strain on more health-related symptoms – except musculoskeletal symptoms – remain unexplored. Whether different stress reactions occur simultaneously was also unresolved. It is quite possible that psychological reactions occur in the immediate stress situation and other reactions only when psychological symptoms continue. This might also be the case with musculoskeletal symptoms. The relationship of stress and musculoskeletal symptoms is discussed in more detail below.

Psychosocial factors and musculoskeletal symptoms

One of the assumed relationships between psychosocial factors and musculoskeletal symptoms is that psychosocial factors reduce or increase physical load at work. This relationship was obvious. When understood as physical load, a major part of ergonomic problems could be explained by time pressure and job characteristics. Time pressure, in turn, could be largely explained by job characteristics. When work is arranged so that employees can plan their actions autonomously, exercise their skills at will, and tackle complete work processes, time pressure and physical load are also lower. When workers can influence timing or working methods, they can arrange the most strenuous

tasks to suit themselves best.

In a more comprehensive model, where musculoskeletal symptoms were explained by both psychological stress symptoms and physical load, the relationship between stressors and physical load could not be supported. It is obvious that stressors do have an impact on physical load, but the strongest effects of stressors still seem to be directed at psychological stress. Psychological stress, in turn, affects musculoskeletal symptoms.

It is possible that these contradictory findings are a result of using different stressors in two studies. Probably only some psychosocial stressors are related to physical load. It is logical that time pressure and physical load are related to each other. It is also likely that physical load and patient-related stressors correlate. But patient-related stressors mostly describe the experience that patients are troublesome. Patients are often psychologically and physically demanding, but psychological demands do not inevitably influence physical load. The experience of patients being demanding has a real effect only on psychological stress symptoms. The situation is different for time pressure, which may have real effects on how work is done and in that way influence physical load; movements become hurried and good lifting techniques are not used. It is also probable that job design exerts real effects on physical load. The possibility that only time pressure is related to physical load was also tested, although not presented (only the best models were presented.) Even if only time pressure was related to physical load and patient related stressors to psychological stress the fit of the model was worse.

Thus, this study supported the hypothesis that psychosocial factors have an effect on musculoskeletal symptoms via psychological stress symptoms. The mechanism, however, could not be explored. In the prevention of musculoskeletal symptoms this information has some implications: the importance of ergonomic interventions does not diminish, but prevention of stress becomes more important. The study findings emphasize the importance of decreasing time pressure and patient-related stressors. Concerning time pressure, job design turned out to be effective. It is probable that job design also has effects on patient-related stressors, but this requires more research.

Patients' functioning in shaping the work environment

It was supposed that patients' functioning would shape the work in the physical and psychological sense. The findings showed that employees' interpretation of patients plays a significant role in the stress process. But in this study patients' functioning did not have as much effect on physical load or time pressure as on patient-related stressors. In future it would be important to

explore how employees' knowledge, goals and cultural values in a work unit are related to their interpretation of patients. Nurses' aides experienced more patient-related stressors than other workers. It is possible that low levels of education and inappropriate knowledge about the elderly and illnesses of old age increase stress and decrease effective coping relating to dementia-related symptoms, for example. What is then the effect of different goals and orientations on work? If the orientation is functional nursing, patients who demand attention may be experienced as stressful because they challenge the work schedule. If the orientation is more individual, however, this kind of stress is more unlikely. However, if a worker is individually oriented and work is organized according to functional nursing, patients may be experienced as stressful because the goals are not achieved. Individual orientation and involvement with patients may thus increase stress.

It is quite surprising that the effects of patients' functioning on physical load or time pressure was not stronger. It is possible that the data were homogeneous concerning physical load. The content of patient-related stressors may be another reason. The scale consisted mostly of dementia-related evaluations of patients, and perhaps such evaluations are more closely linked to psychological stress than ergonomic problems. It is also possible that when employees answer questionnaires their experience of ergonomic problems, such as difficult working positions, may be related to patients' functioning. But perhaps only part of this experience is related to musculoskeletal illness. In wards with physically very ill patients, work may naturally involve heavy weights (like lifting or moving). But even in a ward with dementia patients employees stated that they have plenty of ergonomic problems (like helping in toilets). However, the effect on musculoskeletal illness of the latter ergonomic problems may be different. Another possibility is that ergonomic problems also have several other explanatory factors, like time pressure and job characteristics. It may be that patient-related stressors have a more straightforward link to patients' functioning. Other possible explanations stem from the study design. Firstly, the data were rather small, consisting of only 13 units. Secondly, staff resources were not taken into account. The number of employees per patient may be related to physical load directly, but less directly to psychological stress.

Knowledge structures concerning old people

Employees' knowledge structures concerning old people differed rather widely across working units. This indicates that cultures in the care for the elderly embody conflicting values, knowledge and goals. Such conflicts may imply a potential for a improvement in working units, but may also suggest that some

employees are rather satisfied with their work and some are frustrated when they cannot achieve their goals. Strong and unanimous cultures with shared understanding about work have traditionally been considered effective. If the goals and shared knowledge are adequate this may be the case. But in a situation where this understanding needs upgrading in order to succeed, a strong culture may be a barrier to effective activities, and especially to change. In a strong culture the knowledge guiding the work becomes unconscious, automatic information processing. The basis on which working procedures evolve are difficult to discuss because employees are not aware of them, and this may be the case in care for the elderly. A strong culture prevails, which has guided work for a long time. New ideas about individual care have been implemented without resolving the real schemes that work is based on.

This study was unable to clarify the relationships between cultural conflicts and stress, or between different interpretations of skill variety and job satisfaction. But the differences apparent in employees' knowledge and goals about patients lend support to this idea.

Work in institutions

The results suggest that the work involved in home care is largely satisfactory and not too demanding. In terms of job characteristics the work is almost ideally organized. These findings are supported by another study conducted by Stakes (Elovainio & Rintala, 1997), although in other Finnish studies work in home care has been described as highly demanding, especially in terms of physical work (Elovainio & Lindström, 1993; Pohjonen et al., 1995; Suurnäkki et al., 1985; Torgen et al., 1995). In these other studies, however, home care was compared to all other hospital care and not specifically to institutional care for the elderly. Moreover, the methods were different from this study. It is also possible that in this study, where the work of municipal home makers and home care was based on team-work, job characteristics were better and stress lower than in general.

Institutional care seems to be a rather tough job. Work is both physically and psychologically demanding and provide too few challenges for employees. There is, however, evidence that psychological and physical demands can be reduced. Firstly, by developing the organization of work it is possible not only to improve job characteristics and increase job satisfaction, but also to decrease the level of stressors such as time pressure and physical load. Secondly, it was proved that reducing psychological stress is important not only as such but also in decreasing musculoskeletal problems (compare Bongers et al., 1993).

Work appears to be especially hard for nurses' aides in health center hospitals. Time pressure, ergonomic problems and patient-related stressors are at very high levels. But at the same time work appears to be more satisfactory for nurses' aides than other occupations and nurses' aides in residential homes. This may be due to different need for personal growth in different occupations. As the need for growth of nurses' aides in health center hospitals is lower than other occupations job satisfaction is easier to achieve, despite rather low opportunities for skill utilization. In health center hospitals aides' work consists mostly of cleaning and assisting. Because their tasks are clearly defined and work can be done independently, task identity and autonomy are at a rather high level. But at the same time nurses' aides do not feel they belong in the working group of nurses and organizational co-operation with other occupations is experienced as worse than other workers'. In residential homes aides are more involved in practical nursing and their range of tasks is wider. Opportunities to use their skills are better, but task identity is lower and patient-related problems more frequent. Also, they have a better sense of belonging to a working group and co-operation is reported to be better.

The high level of patient-related stressors raises the question of the adequacy of education. As patients with dementia symptoms and physical health problems are more demanding, coping may not be sufficient when theoretical knowledge fails to provide enough cognitive resources to understand behavior and respond to it appropriately. These findings lend support to this. It is probable that the functional abilities of patients have an effect on the physical work load. But, somewhat surprisingly, their influence on psychological stress appears to be stronger. The possible buffering effect of education or skills was not tested, but with nurses' aides reporting more patient-related stressors than other workers, it seems apparent that sufficient knowledge is needed, not only for quality of care but also for minimizing stress.

The problem of skills in long-term care may be two-fold. For trained nurses long-term care is a place where skill utilization is a problem, as the results show. Some nurses see work as routine operations lacking possibilities for control over the job or for the use of skills learned in training (Schaefer & Moos, 1996). For skilled nurses caring for acute and demanding patients may have positive effects, as Schaefer and Moos (1996) show. But caring only for long-term care patients is not experienced as challenging enough. On the other hand, for staff with low levels of training the behavior of dementia or mentally ill patients may be difficult to cope with and to manage in the right way (Spore et al., 1991). Patients with Alzheimer's disease in intermediate phases, when they are still active, are seen as hard to deal with by caretakers with inadequate training (Chappel & Novak, 1992). Despite the cognitive demands in

dealing with patients, work is described as endless routine operations and uninteresting. Chappel and Novak (1992), for example call for lightening the demands at work and making it more interesting. It seems that the cognitive demands of work with long-term care patients are not fully understood.

On the other hand, Brannon et al (1988) found that the skill variety of nursing assistants was especially low and that of practical nurses reasonable. They conclude that practical nurses have a professional status in nursing homes. In hospitals the professional status of practical nurses would be significantly lower, and their tasks more of the assisting type. Brannon et al describe practical nurses as acting like middle-managers who supervise aides. In two Finnish studies (Rintala & Elovainio, 1997; Sinervo, 1997) using the same methods the skill variety of practical nurses was significantly lower both in residential homes and health centers than that of aides. In the Finnish system the work of nursing assistants in health centre hospitals consists mostly of cleaning and assisting while in residential homes they participate in nursing tasks. In health center hospitals the skill variety of assistants is significantly low and in residential homes comparable to Brannon et al's findings. Brannon et al conclude that the work of assistants should be made more challenging, but also that skills training is needed (like Chappel and Novak, 1992). These initiatives were also put into practice in the study of Smyer et al (1991). Although skills could be improved, changes in job characteristics and quality of care were not apparent.

In health center hospitals it may be problematic to expand the task base of aides. Skills of aides are not sufficient for taking care of acute patients. In residential homes, too, the levels of education must be raised or further training increased in the future as clients become more demanding. But it remains unclear how to make work more interesting and to enhance the opportunities for skill utilization. One possibility might be to create smaller, specialized units, and there are some findings from qualitative research to support this. But this raises the question of what culture and goals the workers would prefer. In this study cultures seemed to be divided into two – maybe more – competing cultures. In the first one the values of functional nursing were apparent. In functional nursing work is divided into small pieces and a strict task distribution used. It may be supposed that the values of functional nursing do not support small units with homogeneous clients, but rather emphasize the technical skills and variety at work derived from tasks that are necessary with acute patients. Organizational change also requires a change of culture and goals. If these remain unchanged, experiences of small units may be negative. In small units experiences of growth and skill utilization must be derived elsewhere.

Limitations of the research

This study had several limitations. The cross-sectional design was a limitation when causal links between variables were analyzed. Although the statistical methods offer some assumptions of causality it is not possible to prove the findings. For example, the findings concerning paths from stressors to psychological stress and musculoskeletal symptoms require evidence from longitudinal settings. The relationships between job characteristics and stressors also need to be verified in longitudinal studies.

The sample size is problematic in several ways. Firstly, the small sample size did not allow testing of the models in subgroups such as occupational groups or different types of institution. Secondly, the generalizability of the results was problematic because of the small non-randomly selected sample with only 13 units. Institutions may be unique in a number of ways. Thirdly, the small number of units did not permit the use of multilevel techniques which would help in evaluating the effect of a unit, instead of the effect of different individuals.

In several analyses it would have been informative to be able to compare staff resources and patients' functional abilities and to standardize the effect of these factors on stressors or stress symptoms.

In exploring the relationships between factors from different theoretical constructs it would be important to obtain data from independent sources. In this study, however, job characteristics, job satisfaction, stressors and stress symptoms, were all measured by the same questionnaire. This raises the question of whether these constructs are really independent of each other.

In the qualitative part of the study knowledge was analyzed only on a rather general level. It is, however, questionable how much this general level of knowledge really guides work and how much it is related to more detailed knowledge of individual patients. Overall, it is debatable whether it is possible to obtain knowledge which really guides work using interviews. Much of knowledge may be in nonverbal form: silent knowledge.

Challenges for future research

The findings of this research suggest that job design can reduce stressors. However, data gathering using a single instrument prompts several doubts. Multiple measures should be used when the relationships between job characteristics and stressors are explored, if job characteristics are supposed to be more objective. In future it would also be important to explore more carefully

the relationships between job satisfaction and different stress symptoms. This study showed that most of the antecedent factors of stress symptoms and job satisfaction were separate, but the relationships between stress symptoms and satisfaction were not analyzed. This question, however, requires longitudinal study designs.

There were some clear relationships between stress symptoms and musculoskeletal symptoms. The mechanisms in this process would require further research. In this study stressors had an effect on psychological stress symptoms, which mediated the effect on musculoskeletal symptoms. There may be some other symptoms mediating the effect which should be explored. What should also be examined is the possible (even probable) relationship between different stressors and physical load. In this study an effect of stressors on physical load was indicated, but using a more comprehensive model this effect was less evident. The effect should be analyzed with different stressors and larger samples, as well as with a longitudinal design.

An effect of patient characteristics on stressors, stress symptoms and musculoskeletal symptoms was found in this study, but this kind of analysis should be replicated in a larger sample. More working units would also be needed. Testing the effect of patient characteristics appropriately would require multilevel approaches and standardizing the effects of staff resources. In this analysis the possible effect of unit size should be analyzed, too. Real differences between units – not only between individuals – should be explored more carefully. As several personality effects have been indicated, real variation between working units should be explored in terms of stress, health, and job satisfaction, as well as quality or performance.

This study could only scratch the surface of the relationships between cultures, knowledge and goals from the point of view of stress research. If cultures, knowledge and goals do indeed vary as this study showed, there are several implications for stress research and in the development of work. More individual approaches in stress research are needed. The concrete meanings of theoretical constructs like autonomy, time pressure and patient-related stress should be studied. The meaning of stressors may vary, and particularly the meaning of implementation.

Measurement and interpretation of knowledge, goals and cultures are difficult. As concepts have personal meanings to individuals, qualitative methods are required. But in order to obtain evidence for the effects of qualitative differences in knowledge, goals and cultures, the qualitative measurements should be quantified. However, it is difficult to create samples large enough to quantify the qualitative findings, yet at the same time to control expenses and work amount. Still, knowledge concerning different orientations at work is im-

portant, because these orientations have a strong effect on quality, on the implementation of new working methods and on stress.

Recommendations for the development of service in care for the elderly

Work in institutions should be made more challenging for employees. Modular nursing models may prove useful to this end. Smaller numbers of patients combined with more autonomy in working groups increases the possibilities for individuality in care. It could also improve opportunities to use one's skills and have more authority in decision-making. This would, according to the results of this study, also decrease the level of stressors, psychological stress and musculoskeletal symptoms.

Moving to a new nursing model also requires cultural change, however. Implementing a new model without cultural change may lead to several problems stemming from cultural diversity. The new model may have diverse meanings for employees with different goals and knowledge. If present goals at work stem from a culture of functional nursing a new model may be experienced as decreasing autonomy and skill variety. Job division can no longer be based on functions and occupations.

In health center hospitals acute patients may render this diversity more problematic. Acute patients may be experienced as more challenging and rewarding for nurses and cultural conflicts may occur if there are specialized units for long-term care patients only. It would seem, however, that the demands and challenges of long-term care need to be highlighted. Traditional cultures do not value long-term care and possibly some kind of new culture should be created. Ideas for this kind of culture exist, but they are but they are in contradiction with the old culture. Difficulties may also occur because the co-operation of occupational groups is problematic. Patients have many illnesses, and the nurses' aides have insufficient knowledge to greatly widen the scope of their work.

New ways to organize work are needed, as well as cultural change. But traditional, individual skills training is also needed. Patients have become more demanding both psychologically and physically, and more knowledge about the illnesses of old age and quality of life in institutions is needed. Finally, working places should be aware of the kinds of knowledge and goals that really guide work.

Summary

This research set out to examine work and well-being of workers in care for the elderly from different theoretical perspectives. Stress at work and job design were the major emphasis, but a broader understanding was attempted from the cognitive and cultural perspectives. The objectives of the study were 1) to examine work and well-being of workers and the problems they face at work in care for the elderly in Finland; 2) to discover whether or not the explanatory variables of stress and satisfaction differ, and whether different stress-related symptoms are related to similar stressors; 3) to explore the relationships between stressors and job characteristics; 4) to explore the relationships between stressors, physical load, psychological stress symptoms and musculoskeletal symptoms; 5) to discover how patients' functional abilities shape the work, and the stressors and physical load at work, as well as psychological stress symptoms and musculoskeletal symptoms, and 6) to explore how workers' knowledge about patients guides their work and whether there are any cultural aspects to this knowledge.

The data were gathered using a questionnaire survey of personnel, interviews of employees and measurements of patients' functional abilities. The questionnaire survey (N=204, 82% of employees) and patient evaluations (N=464, 100% of patients) were gathered from six units of three municipal residential homes, four health center hospital units of two municipalities and two home care organizations. In the analyses for the fourth objective patient evaluations were aggregated for each unit and combined with the data set on the personnel. Only those employees who could be linked to a particular unit were included in these analyses (N=168). In the original data 51% of respondents were registered nurses, practical nurses or municipal home makers, and 25% nursing aides. Head nurses, registered nurses, practical nurses or municipal home makers evaluated their patients in their units. One third of patients were clients of home help services or home care, 40% lived in residential homes and 26% in health center hospitals. The mean age of clients was 80.7 years, and 75% of them were women. The qualitative data were gathered from seven residential homes (N=69).

In the quantitative part of the study the explained variables were psychological stress symptoms (such as nervousness and difficulty in concentrating), psychosomatic stress symptoms (such as headache or stomach ache), muscu-

loskeletal symptoms, overall job satisfaction and growth satisfaction. These outcome variables were explained by job characteristics (skill utilization, autonomy, task identity, feedback from work and interaction at work), stressors (such as time pressure and patient-related stressors), physical load (ergonomic problems) and patients' functional ability (activities of daily living and dementia symptoms). The data were analyzed using the t-test in pairs, regression analysis and confirmatory factor analysis (LISREL). In the qualitative part, the concepts workers used to describe their clients, clients' needs and goals at work were categorized and then quantified. Workers' use of categories and knowledge structures were studied using correlations between categories.

The results showed that work in institutional care for the elderly is demanding both psychologically and physically. In home care, workers had less symptoms than in institutional care. In institutional care the most severe problems were ergonomic problems, time pressure and patient-related stressors. In terms of motivation the problems were low possibilities to use skills, lack of autonomy, low levels of task identity and lack of feedback from work. Nurses' aides had the most severe problems.

Different stress symptoms and job satisfaction could be explained by separate stressors. Musculoskeletal symptoms were related to physical load, and psychosomatic symptoms to physical load, lacking feedback and problems in co-operation. Psychological symptoms were related to time pressure, problems in co-operation and lacking autonomy. Overall job satisfaction was explained by satisfaction with management, lack of management, problems in human relations, skill utilization and autonomy. Growth satisfaction was explained by these variables, as well as time pressure and task significance.

A model relating job characteristics, time pressure and physical load lends support to the idea that well-organized work may decrease the level of time pressure and thereby physical load. As ergonomic problems was the major factor explaining musculoskeletal symptoms it is probable that these symptoms can be reduced by job redesign. It seems, however, that the influence of psychosocial factors on musculoskeletal symptoms is mediated by psychological stress symptoms. In the analyses in which this was studied, this mediating effect gained support.

In a model exploring the relationships between patient characteristics, stressors and well-being of workers, the effect of patient characteristics on musculoskeletal symptoms was mediated via patient-related stressors and psychological stress symptoms. The relationships between patient characteristics and time pressure and physical load were less evident. Although it is obvious that patient characteristics are also related to physical load of work, in terms of musculoskeletal symptoms it is more important how workers interpret their

clients.

In the qualitative part of the study workers' knowledge guiding the work was heterogenous. Patients were most often described as in need for help or as physically or mentally ill. Personality and social aspects were rarely described. Concepts describing patients' needs and goals at work were more often related to psychological and social aspects. When analyzing concept networks it seemed that work was guided by conflicting, not shared, knowledge and goals. When workers described patients as in need of help or as ill, relationships to other parts of the concept network were rare. Seldom emphasized as patients' needs or workers' goals were the importance of social relationships, meaningfulness of life, individuality or support.

Two conclusions can be drawn about the relationships between stress and job satisfaction. Firstly, the traditional explanatory variables of job satisfaction – job characteristics – also affect stressors. This lends support to the assumption that job characteristics are less dependent on the appraisal than stressors. Secondly, stressors explain not only stress reactions but also job satisfaction, although the explanatory variables of different outcomes of stress and job satisfaction are separate.

The results supported the previous findings about the relationships between psychosocial factors and musculoskeletal symptoms. On one hand the results show that by redesigning work – increasing autonomy and possibilities to use skills, and creating psychologically whole tasks – physical load can be reduced. On the other hand, the health effects – musculoskeletal symptoms – of psychosocial factors are not primarily mediated via physical load. The major pathway by which psychosocial factors influence musculoskeletal symptoms is mediated by psychological stress symptoms. To reduce musculoskeletal symptoms requires not only ergonomic development but also reduction of stress. Functional abilities of patients shape the work environment – both physical and psychological. The most evident effects of patient characteristics seemed to be mediated via psychological stress. Patient characteristics are not a stressor as such. To be a stressor requires that workers experience patients as stressful. These interpretations may be related to the differences in workers' knowledge and goals which guide the work.

Work in institutional care is rather demanding for all occupations, but the problems differ. For well-educated workers the job may not offer enough challenges and possibilities to use skills. For workers with lower levels of education work has been expanded in the direction of practical nursing. Although this is positive in terms of job design, knowledge and skill may be inadequate as patients have become more demanding. Training might help workers to better cope with difficult patients and reduce stress levels. This does not exclude the

importance of redesign in order to increase positive challenges and to decrease routinization. Development should, however, take into account the different work orientations and conflicting cultures. Organizing work into smaller modules, for example, may carry different meanings for workers according to their goals. Redesign should be combined with cultural development, which involves reflecting on work orientations.

Summary in Finnish

Tutkimuksen tarkoituksena oli analysoida työtä ja henkilöstön hyvinvointia vanhustenhuollossa useista näkökulmista. Stressi ja työn muotoilu olivat tutkimuksen keskeiset painopisteet, mutta laajempaa näkökulmaa etsittiin organisaatiokulttuurin ja informaation prosessoinnin näkökulmista. Täsmennettynä tavoitteena oli 1) Luoda kuva suomalaisesta vanhusten huollon työstä ja siihen liittyvistä ongelmista; 2) Selvittää, eroavatko stressiä ja työtyytyväisyyttä selittävät tekijät toisistaan ja missä määrin eri stressioireita voidaan selittää samoilla stressitekijöillä; 3) Selvittää, miten stressitekijöitä voidaan selittää työn piirteillä; 4) Selvittää stressitekijöiden, fyysisen kuormittavuuden ja stressioireiden yhteydet tuki- ja liikuntaelinten oireisiin; 5) Selvittää, miten asiakkaiden kuntoisuus on yhteydessä työn fyysiseen kuormittavuuteen, stressitekijöihin, stressioireisiin sekä tuki- ja liikuntaelinten oireisiin ja 6) Selvittää, minkälainen asiakasta koskeva tieto ohjaa työtä ja mitä yhteyksiä organisaatiokulttuurilla on tietoon.

Tutkimusaineistoina käytettiin henkilöstökyselyä, henkilöstöhaastattelua ja asiakasmittauksia. Henkilöstökysely (N=204, 82 % henkilökunnasta) ja asiakasmittaukset (N=464, 100 % asiakkaista) kerättiin kolmen kunnan kuudelta vanhainkotosastolta, kahden kunnan neljältä terveyskeskuksen vuodeosastolta ja kahden kunnan kotipalvelusta ja kotisairaanhoidosta. Tutkimuskysymykseen neljä vastattaessa asiakasmittauksien osastokohtaiset keskiarvot yhdistettiin henkilöstökyselyyn. Tässä yhteydessä analyysiin otettiin vain ne työntekijät, jotka työskentelivät pääsääntöisesti tietyllä osastolla. Henkilöstökyselyssä 51% vastanneista oli sairaanhoitajia, perushoitajia tai kodinhoitajia, 25% laitos- tai hoitoapulaisia. Osastonhoitajat, sairaanhoitajat, perushoitajat tai kodinhoitajat toteuttivat osastollaan asiakasmittaukset. Asiakkaista 33 % oli kotipalvelun tai kotisairaanhoidon asiakkaita, 40 % asui vanhainkodissa ja 26 % terveyskeskuksen vuodeosastolla. Asiakkaiden keski-ikä oli 80,7 vuotta ja asiakkaista 75 % oli naisia. Henkilöstöhaastattelut kerättiin seitsemästä vanhainkodista (N=69).

Tutkimuksen kvantitatiivisessa osassa selitettävät muuttujat olivat psyykkiset stressioireet (kuten hermostuneisuus ja keskittymiskyvyttömyys), psykosomaattiset stressioireet (kuten päänsärky ja vatsakipu), niska-, hartia- ja selkävaivat, yleinen työtyytyväisyys ja kasvutyytyväisyys. Näitä tekijöitä selitettiin työn piirteillä (kykyjen käyttö, työn itsenäisyys, työkokonaisuus, palaute työstä sekä vuorovaikutus työssä), stressitekijöillä (kiire, asiakkaaseen liittyvät rasitus-tekijät, johtaminen, ihmissuhdeongelmat ja yhteistyön ongelmat), työn fyysisel-

lä kuormituksella (ergonomiset ongelmat) sekä asiakkaiden kuntoisuudella (joka päiväiseen elämään liittyvä toimintakyky, dementiaoireet). Aineiston analyysiin käytettiin parittaista t-testiä, regressioanalyysiä sekä konfirmatorista faktori-analyysiä (LISREL-ohjelma). Tutkimuksen laadullisessa osassa työntekijöiden vanhuksia, vanhusten tavoitteita ja työn tavoitteita koskevat käsitykset jaettiin kategorioihin. Kategorioihin jaon jälkeen aineisto koodattiin ja kvantifioitiin. Kategorioiden käyttöä ja tietorakenteita analysoitiin korrelaatiotarkastelun avulla.

Tutkimustulokset osoittivat, että työ vanhusten laitoshoidossa on sekä psyykkisesti että fyysisesti erittäin kuormittavaa. Kotihoidossa psyykkisiä ja fyysisiä oireita oli vähemmän. Laitoshoidossa suurimpia ongelmia olivat ergonomiset ongelmat, kiire sekä asiakkaisiin liittyvät rasitustekijät. Työn motivoivuuden näkökulmasta ongelmia olivat heikot mahdollisuudet kykyjen käyttöön, työn osittuneisuus, vähäinen itsenäisyys sekä palautteen vähäisyys. Erityisen suuria ongelmat olivat terveyskeskuksen vuodeosaston laitosapulaisilla.

Eri stressioireita ja työtyytyväisyyttä voitiin selittää pääasiassa eri tekijöillä. Fyysisiä oireita selitti työn fyysinen kuormitus, psykosomaattisia oireita lisäksi yhteistyön ongelmat ja työstä saatavan palautteen puute. Psyykkisiä oireita selittivät kiire, yhteistyön ongelmat ja heikko itsenäisyys. Yleistä työtyytyväisyyttä selittivät tyytyväisyys johtamiseen, vähäiset ihmissuhdeongelmat, mahdollisuus kykyjen käyttöön sekä itsenäisyys. Kasvutyytyväisyyttä selittivät näiden lisäksi kiire ja työkokonaisuus.

Mallissa, jossa tutkittiin työn piirteiden, kiireen ja fyysisen kuormittavuuden yhteyksiä, todettiin, että hyvin organisoidulla työllä voidaan kiireen tunnetta vähentää ja tätä kautta myös fyysistä kuormittavuutta. Koska ergonomiset ongelmat ovat merkittävin fyysisten rasitusoireiden selittäjä, on todennäköistä, että fyysisiä rasitusoireita voidaan ehkäistä parantamalla työn organisointia. Näyttää kuitenkin siltä, että työn psykososiaalisten ominaisuuksien vaikutus fyysisiin rasitusoireisiin välittyy selkeämmin psyykkisen stressin kautta. Mallissa, jossa näiden tekijöiden yhteyksiä tutkittiin, molemmat välittävät yhteydet olivat olemassa, mutta silti malli, jossa työn psykososiaalisten tekijöiden yhteys fyysisiin rasitusoireisiin välittyi vain psyykkisten stressioireiden kautta, sopi paremmin tutkimusaineistoon.

Mallissa, jossa tarkasteltiin asiakkaiden kuntoisuuden yhteyksiä työn rasitustekijöihin, todettiin että kuntoisuuden yhteydet fyysisiin rasitusoireisiin välittyivät erityisesti asiakkaisiin liittyvien rasitustekijöiden (työntekijöiden kokemus asiakkaiden fyysisestä ja psyykkisestä huonokuntoisuudesta) ja psyykkisten stressioireiden kautta. Asiakkaiden kuntoisuudella oli selvästi heikompi yhteys kiireeseen tai työn fyysiseen rasittavuuteen. Vaikka lieneekin selvää, että asiakkaiden kuntoisuudella on yhteys työn fyysiseen kuormitukseen, on sillä suu-

rempi merkitys, miten rasittaviksi työntekijät kokevat asiakkaat ja missä määrin tämä tuottaa psyykkistä stressiä.

Tutkimuksen laadullisessa osassa todettiin, että työtä ohjaava tieto oli hyvin erilaista eri työntekijöillä. Kun tarkasteltiin työntekijöiden käsityksiä asiakkaista, todettiin, että asiakkaita kuvattiin useimmin avuntarpeen ja fyysisen tai psyykkisen sairauden kautta. Asiakkaiden persoonallisuutta tai sosiaalisia tekijöitä kuvattiin harvemmin. Sen sijaan asiakkaiden tarpeissa ja työn tavoitteissa psyykkiset ja sosiaaliset aspektit tulivat esille. Tarkasteltaessa työtä ohjaavien käsitteiden yhteyksiä toisiinsa eri käsiteverkkojen tulkittiin edustavan kulttuurista ristiriitaa. Silloin, kun vanhuksia kuvattiin avun tarpeen tai sairauden kautta, yhteydet muihin käsitejärjestelmän osiin olivat vähäisiä. Tässä käsitejärjestelmässä oli harvinaista korostaa asiakkaiden sosiaalisten suhteiden, elämän mielekkyyden, yksilöllisyyden tai sosiaalisen tuen merkitystä asiakkaiden tarpeina tai työn tavoitteina. Silloin, kun asiakkaita kuvattiin persoonallisten ja sosiaalisten tekijöiden avulla, käsitejärjestelmän osilla oli runsaasti yhteyksiä toisiinsa. Asiakkaiden tarpeet näyttivät tällöin muodostuvan käsiteverkon keskeiseksi yhdistäen perushoidon, sosiaaliset suhteet, elämän mielekkyyden, inhimillisen kohtelun, peruspalvelut ja turvallisuuden toisiinsa.

Johtopäätöksinä stressin ja työtyytyväisyyden yhteyksistä voidaan todeta, että ensinnäkin työtyytyväisyyden perinteisillä selittäjillä, työn piirteillä, voidaan selittää stressitekijöitä. Tämä antaa tukea oletukselle, että työn piirteet eivät samassa määrin ole seurausta työntekijöiden tulkinnoista kuin stressitekijät. Toiseksi perinteisinä stressitekijöinä pidetyt ilmiöt selittävät myös työtyytyväisyyttä, vaikka suurelta osin stressioireiden ja työtyytyväisyyden selittäjät poikkesivatkin toisistaan. Stressin ja tyytyväisyyden suhdetta toisiinsa ei pystytty selittämään, mutta oli ilmeistä, että erilaisilla psykososiaalisilla tekijöillä oli erilaiset seuraukset.

Tutkimus antoi myös tukea sille oletukselle, että työn psykososiaalisilla tekijöillä on merkitystä tuki- ja liikuntaelinten oireiden esiintymisessä. Tutkimus antoi toisaalta tukea sille oletukselle, että järjestämällä työ hyvin voidaan vaikuttaa fyysiseen kuormitukseen. Toisaalta tutkimus antoi tukea sille oletukselle, että psykososiaalisten tekijöiden yhteys tuki- ja liikuntaelinten oireisiin on psyykkisen stressin kautta välittyntä – ei siis niinkään fyysisen kuormituksen. Asiakkaiden kuntoisuuden todettiin muokkaavan työntekijöiden fyysistä ja psyykkistä työympäristöä ja sen rasiustekijöitä. Asiakkaiden kuntoisuudella oli yhteys myös tuki- ja liikuntaelinten oireisiin. Työntekijöiden tulkinnot asiakkaiden kuntoisuudesta olivat keskeinen välittävä tekijä tässä yhteydessä, jota psyykkiset stressioireet edelleen välittivät. Käsitykset asiakkaista ja heidän keskeisistä tarpeistaan vaihtelivat voimakkaasti. Tällä saattaa olla yhteys myös työntekijöiden stressiin ja työssä viihtymiseen.

Työ vanhusten laitoshuollossa on kaikille ammattiryhmille erittäin kuormittavaa. Laitoshuollon ongelmat näyttävät kuitenkin olevan erilaisia eri ryhmille. Hyvin koulutetuille työntekijöille työ ei tarjoa riittävästi haasteita ja mahdollisuuksia kykyjen käyttöön. Toisaalta vähäisen koulutuksen saanut avustava henkilökunta on laajentanut työtään hoitotyön suuntaan. Näyttää ilmeiseltä, että heille lisäkoulutuksesta olisi hyötyä paitsi työn hallinnan kannalta myös psyykkisen kuormituksen vähentämisen kannalta. Samaan aikaan heidän työtään olisi muokattava myös haastavammaksi ja vähemmän rutiininomaiseksi. Kaikissa ammattiryhmissä esiintyi erilaisia työskentelyorientaatioita, mikä tulisi ottaa huomioon työtä kehitettäessä. Työn organisoiminen esimerkiksi pienemmiksi moduuleiksi saattaa sisältää hyvin erilaisia merkityksiä eri työntekijöille heidän tavoitteistaan riippuen. Pelkkä työn uudelleen organisointi tai koulutus ei riitä, vaan olisi pystyttävä muuttamaan organisaatiokulttuureja yhtenäisemmiksi. Työyhteisöjen olisi myös oltava tietoisia siitä, minkälaisen tiedon ja tavoitteiden varassa työtä tehdään.

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