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Stress, Satisfaction, and Quality:

Studies of Organizational and Individual Well-Being in Health Care

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Sarah Thomsen MA MPH

Fakultetsopponent:
Professor Kari Lindström
Finnish Institute of Occupational Health
Helsinki, Finland

Handledare:
Professor Bengt Arnetz
Institutionen för folkhälso- och vårdvetenskkap,
Enheten för socialmedicin
Uppsala universitetet

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ABSTRACT

The aim of this thesis is to indicate key organizational attributes in the health care work environment that can have an impact on both personnel well-being and the quality of care they provide. In order to achieve this aim, four steps were carried out: identifying important individual and organizational attributes, testing the validity and reliability of the measurement instrument and process, testing a mediational model using structural equation modeling, and investigating the effects of a quality improvement initiative on personnel and patients.

This thesis is based on data from three studies. Study one was a cross-sectional study of the psychosocial work environment and well-being of all psychiatrists and psychiatric nurses employed by the County of Stockholm (n=1,554), as well as a random sample of the same personnel categories in the West Midlands, England (n=785). The second study was a non-response follow-up by telephone of a random sample of the personnel of the Psychiatric division of the Southern Stockholm health district (n=71). The third study was a controlled, prospective study of the effects of a quality improvement initiative on personnel satisfaction and well-being (n=302, time 1; n=201, time 2), as well as patient-rated quality of care (n=528, time 1; n=539, time 2).

Both organizational and individual factors play an important role in the health care work environment. In particular, goal quality, relations with one's manager, efficiency, personal development, autonomy and work climate are important factors for determining personnel's sense of professional fulfillment. In turn, professional fulfillment, or job satisfaction, plays an important role in mediating the relationship between organizational and individual well-being. That is, it seems that personnel's perception of their work environment does not have a direct effect on their own health. Rather, job satisfaction transforms these perceptions into elements of perceived health.

The validities and reliabilities of the items in the scales used in this thesis were tested using confirmatory factor analysis. The analyses indicated that the scales needed more work, although the validities of the individual items were acceptable. Furthermore, two of the scales were not found to be unidimensional, one of which was the Rosenberg Self-esteem Scale. The analysis of non-response did not reveal any evidence for selection bias, despite an original response rate of 52%.

Finally, the controlled, prospective study did not find evidence that a quality improvement initiative improved the work environment, job satisfaction or individual well-being for health care workers, or on patient-rated quality of care in the department where the initiative was carried out. However, there was a significant, positive relationship between personnel's perception of their work environment and patients' ratings of the quality of care they received.

This thesis is important because it identifies key organizational attributes in the health care work environment that can impact on personnel job satisfaction and well-being, and on the quality of care they provide. The results also have implications for the working life of employees in other knowledge and service-based professions.

Keywords: work environment, health care, stress, job satisfaction, participation, physicians, nurses, quality of care, patient satisfaction.

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Sarah Thomsen

Karolinska Institutet
Department of Public Health Sciences
Division of Psychosocial Factors and Health

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To Ulla

"There are two ways of detecting something that no one has yet seen: one is to aim at the finest detail by getting as close as possible with the best available analyzing instruments; the other is merely to look at things from a new angle where they show hitherto unexposed facets. The former requires money and experience; the latter presupposes neither; indeed, it is actually aided by simplicity, the lack of prejudice, and the absence of those established habits of thinking which tend to come after long hours of work. The General Adaptation Syndrome could have been discovered during the Middle Ages, if not earlier; its recognition did not depend upon the development of any complicated pieces of apparatus, new techniques of observation, nor even upon much training, ingenuity, or intelligence, as far as that goes, but merely upon an unbiased state of mind, a fresh point of view."

- Hans Seyle
The Stress of Life

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I. Thomsen S., Dallender J., Soares J., Nolan P. & Arnetz B. (1998). Predictors of a healthy workplace for Swedish and English psychiatrists. *British Journal of Psychiatry* 173, 80-84.

II. Thomsen S., Soares J., Nolan P., Dallender J. & Arnetz B. (1999). Feelings of professional fulfilment and exhaustion in mental health personnel: The importance of organisational and individual factors. *Psychotherapy and Psychosomatics* 68, 157-164.

III. Thomsen S., Arnetz B., Nolan P., Soares J. & Dallender J. (1999). Individual and organizational well-being in psychiatric nursing: a cross-cultural study. *Journal of Advanced Nursing* 30(3), 749-757.

IV. Thomsen S. (2000). An examination of non-response in a work environment questionnaire mailed to psychiatric health care personnel. *Journal of Occupational Health Psychology* 5(1), 204-210.

V. Thomsen S., Aish A.-M., Arnetz B., Soares J. & Nolan P. A confirmatory factor analysis of seven scales used in psychosocial work environment studies of health care personnel. Manuscript.

VI. Thomsen S., Aish A.-M. & Arnetz B.B. Modeling the relationship between organizational and individual well-being: the role of mediational variables. Manuscript.

VII. Thomsen S. & Arnetz B.B. The effects of a quality improvement program on personnel and patients: a controlled, prospective study. Manuscript.

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1. INTRODUCTION

1.1 Background

The work environment of health care workers has become a topic of increasing concern in Europe and North America over the past decade. A large-scale study of the health of employees in Great Britain's National Health Service, for example, found that health care personnel experienced more psychological disturbances than the rest of the population, and that sickness absence rates were higher among health care staff than among comparable groups in other sectors (Williams et al, 1998). At the same time, a study in the United States by The President's Advisory Commission on Consumer Protection and Quality in Health Care found that there had been a 25% rise in the rate of occupational injury and illness among health care workers between 1985 and 1995, compared to a mere 3% rise in private industry during the same period (1998). Not surprisingly, this correlated with a growing morale problem among U.S. health care personnel. Even more alarming are two large-scale studies, one in Finland and one in Sweden, that found that health care personnel have more suicidal thoughts over their lifetimes and a higher suicide rate than the general population (Lindeman et al, 1996; Ramberg & Wasserman, in press).

The reasons for this sharp decline in the health and well-being of health care workers in industrialized nations are probably many, including economic belt-tightening in health care, increases in government regulation of health care, and an increase in outpatient services. In an attempt to halt growing health care expenditures, federal governments switched roles in the 1980's and 90's from purchaser to regulators, taking power and status away from hospitals (Sochalski et al, 1997; Lee & Alexander, 1999; Axelsson, 2000). This forced hospitals and health care trusts to implement significant changes in employee routines and in organizational structure. In many countries this included shifting from inpatient to outpatient services and reducing the average length of stay in hospitals (Sochalski et al, 1997). Many changes have also involved significant downsizing. At the same time, patients are also demanding more say in how their treatment is carried out, and under what circumstances (Vuori, 1991). This move from the "paternalistic model" of health care, where the doctor knows best, to the informed "decision-making model" (Coulter, 1997) indicates a major shift in paradigms in the patient-provider relationship. Such a shift can be seen as yet another pressure on health care providers.

In Sweden, structural changes in health care provision have been apparent since the government realized in the mid-1980's that health care costs were consuming inordinate amounts of the federal budget. As a result, between 1985 and 1995 a quarter of all employment opportunities in health care were eliminated in Stockholm county, and similar measures were taken throughout the rest of the country. Following this rapid downsizing, a plan to reorganize health care in Stockholm while reducing total expenditures further was initiated in 1996 (Socialstyrelsen, 2000). The plan called for reducing health care costs by 2.9 billion crowns (about 400 million USD), of which 350 million crowns (50 million USD) were to come from psychiatric services. The County of Stockholm instituted a widespread plan of reorganization in mental health care including a shift of outpatient resources to the community level and the closing of many in-patient psychiatric services. The result was a 20% reduction in the number of patient-days and a 10% reduction in the number of admissions within the psychiatric care sector between 1995 and 1997 (Socialstyrelsen, 2000).These reforms were mirrored in the United Kingdom, where reductions in personnel and a "de-skilling" of staff

have been reported (Sochalski *et al*, 1997). By the mid 1990's over 95% of people with mental health problems in England were cared for totally in the community (Holdsworth *et al*, 1996) and it was anticipated that within the near future general practitioners would become the largest purchasers of mental health services (Corney, 1996).

Extensive structural changes, downsizing and lack of job security have been shown to lead to job dissatisfaction, minor psychiatric disorders, musculoskeletal disorders and pessimism about the future in employees (Faresjö *et al*, 1997; Landsbergis *et al*, 1999). These characteristics have in turn been linked to stress in employees, which is often manifested as burnout, depression and increased number of sick days (Dolan, 1987; Landeweerd and Boumans, 1988; Petterson *et al*, 1995; Vahtera *et al*, 1997). Burnout has been defined as "a syndrome of emotional exhaustion and cynicism that occurs frequently among individuals who do 'people-work' of some kind"(Maslach & Jackson, 1981). However, other intrinsic and extrinsic factors than "people-work" seem to be just as important, if not more, in determining burnout and stress in psychiatrists. Naisberg-Fennig *et al* (1991) found that personality measures, such as anxiety and repression-sensitization, contributed to 58% of the variance in proneness to burnout among psychiatrists. Furthermore, organizational aspects have been found to be just as important, if not more so, as "patient needs" in determining personnel well-being (Schaufelli & Enzmann, 1998). In fact, even Christina Maslach, the developer of the Maslach Burnout Inventory, has redefined burnout as being more about one's relationship *with work*, rather than one's relationships *at work* (Maslach & Leiter, 1997).

1.2 Aim of the thesis

The high levels of morbidity among health care workers compared to other occupations merits more study. Furthermore, there is a need for clarifying further the types of organizational aspects that prevent such morbidity. In this thesis I attempt to address this need by identifying key organizational attributes in the health care work environment that can have an impact on personnel well-being and quality of care. These attributes were identified and tested in three studies, two of which were cross-sectional and one of which was prospective and controlled. The studies involved four processes:

1. Identifying important individual and organizational attributes that can affect health care personnel's health and satisfaction.

2. Testing the validity and reliability of the measurement instrument and checking for response bias.

3. Developing an explanatory model of the relationship between organizational well-being, satisfaction and individual well-being.

4. Investigating the impact of quality improvement activities on both health care personnel and patients.

In addition, I report here on some results from the third study that are not presented elsewhere. Finally, an integrated model of work environment and quality of care for future research is presented.

1.3 Why study health care workers?

The above evidence makes a clear case for studying the work environment of health care workers in more detail merely by virtue of the increased risk of morbidity and mortality in this occupational group. However, as I explain in the following section, there is growing evidence that there is a real causal link between health care workers' well-being and the satisfaction and health of the patients they care for. Further, knowledge from studies of health care workers are not just important for the occupation itself, but for other professions as well (Karasek & Theorell, 1990; Arnetz, 1996).

There is an even more important reason for studying, and improving, health care workers' work environment than the effects on the personnel. This is the potential impact that poor occupational health in this group could have on the health of the rest of the population. Whereas job dissatisfaction in the manufacturing industry may lead to increased absenteeism and turnover, in health care workers it may also result in "dysfunctional attitudes" towards patients such as dehumanization and callousness (Schaufelli & Enzmann, 1998). There is also significant evidence that personnel attitudes affect patients' health (Ottosson, 1999), indicating that they are not "just" predictors of patient satisfaction. In a review of the literature, my colleagues and I (Thomsen *et al*, 2000) found that there was evidence for a causal relationship between health care workers' work environment and the quality of care they provide. Furthermore, health care workers are under increasing pressure from patients and funders to improve this quality. Numerous quality improvement initiatives have been proposed to bring about these changes. However, these initiatives require substantial human and financial resources that, as I have shown, are already lacking

Studying the health care work environment can also give us insight into the kinds of problems, and hopefully solutions, that other professions experience. Bertil Gardell and his colleagues at the Department of Psychology at Stockholm University made a strong case for the similarities between the health care and manufacturing industries (1979). They proposed that health care was built up on the same principles as the assembly line: increased productivity for decreased costs. The needs of society, or the individual working in the organization, take second place in this model. However, if health care can be compared to early twentieth century manufacturing methods, it also has similarities with methods of production that are associated with the twenty-first century, such as "just-in-time" production and "knowledge workers" (Ulrich, 1998). Just-in-time production methods allow companies to keep costs down by ordering supplies according to demand. In health care, particularly hospitals, personnel must be in a steady state of readiness in order to meet whatever might come in the door, or occur on the ward, at any minute (Gardell *et al*, 1979). Further, the type of product that the health care worker provides, a service, cannot be stocked. Rather, as in other service industries, the service is provided in the meeting between the provider and the patient.

The term "knowledge workers" refers to the new type of worker who is employed to use her brain, and not just her hands, to create ideas or technology. Recruiting and keeping this "intellectual capital" is considered key to the success of companies of the twenty-first century (Ulrich, 1998). Health care workers are clearly more similar to knowledge workers than traditional assembly line workers. This is most obvious in physicians, whose decisions can mean the difference between life and death for a patient. However, registered and practical nurses must also rely on their intellectual capacity to carry out their work, not least in terms of psychological and social competencies when caring for patients (Dolan, 1987).

It may seem strange to compare the work environment of a nurse to that of an engineer or software developer. However, it appears that the organizational stressors that health care workers experience, such as role ambiguity, high job demands, low decision latitude and poor leadership, are similar to those in other industries (Karasek & Theorell, 1990; Arnetz, 1996). Thus, an act of violence from a mentally ill patient, or the death of a terminally ill patient, is expected and understandable, and can be coped with. However, the same violent act, or death, can provoke feelings of helplessness, and eventually apathy, when the structures and processes around the event do not function properly (Guppy & Gutteridge, 1991; Leiter & Harvie, 1996).

In sum, studying health care professionals is important because they are a relatively highly exposed group, because their work environment has a lot in common with the "modern" working place, and because the potential public health consequences of not studying them, and improving their situation, are too significant to ignore.

2. STRESS AND SATISFACTION

This thesis has its theoretical underpinnings primarily in the field of stress research. The job satisfaction literature is also relevant for this research. The following section provides an overview of these fields. In addition, I present the model of the transactional theory of stress as a starting point for the studies in this thesis.

2.1 Stress

The studies in this thesis were developed on the basis of the transactional theory of stress (Cox, 1978; Lazarus, 1990a; Kahn & Byosiere, 1992). This theory was based on early studies of acute stress in animals and humans by researchers such as Walter Cannon (1932), Hans Seyle (1956) and Lennart Levi (1972). Stress was defined by Seyle as "the nonspecific response of the body to any demand, whether it is caused by or results in pleasant, or unpleasant, conditions" (1976, p. 74). This definition reflects the view of all stress theories that the environment is the source of stress and the individual is the target of its effects (Karasek & Theorell, 1990). However, as every individual has a different "psychobiological program," reactions will differ from person to person, and from situation to situation (Kagan & Levi, 1974). These stress reactions are stimulated by situations or conditions called stressors. In the stress process, the individual experience of a stressor as positive or negative will result in an immediate psychological, behavioral, or physiological response that may have long-term consequences on the individual's health (Kagan & Levi, 1974).

The transactional theory of stress represents a marriage of the above researchers' results, which were based in the medical field, with the field of occupational psychology (Kasl, 1996). An example of the latter's contribution to stress theory is the idea of "cognitive appraisal" (Cox, 1978; Lazarus & Folkman, 1984). Cognitive appraisal is "an evaluative process that determines why and to what extent a particular transaction or series of transactions between the person and environment is stressful" (Lazarus & Folkman, 1984, p.19). Lazarus and Folkman focused on explaining what happens in the individual when he or she experiences a stressor. They, as well as Cox (1978), theorized that much of the physiological response to stressors is due to its psychological impact on the individual. Thus, occupational psychologists elaborated on the "psychobiological program" that Kagan and Levi wrote about in an attempt to explain *why* certain stressors cause stress and others do not, and to measure the stress response. This thesis has as its starting point Kahn and Byosiere's model of stress (1992), which synthesizes these medical and psychological views (figure 1). In the following paragraphs I will go through this model step by step.

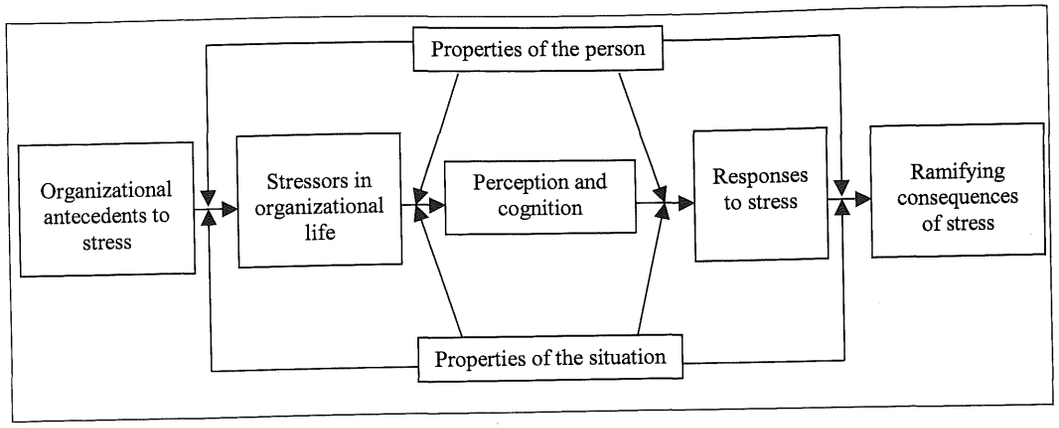

Figure 1: The transactional model of stress (Kahn & Byosiere, 1992)

In this model, there are certain antecedents to stress that may be based in the "objective" work environment such as the size and policies of the workplace, and social and demographic characteristics of the society under study. These antecedents are not addressed in this thesis.

Stressors

Kahn and Byosiere divide studies done on stressors into two categories: task content and its concomitants and role properties (1992). Task content and its concomitants include characteristics of the work task such as monotony, and physical conditions of work. Role properties include social relations at work, role conflict, control, autonomy and workload. This thesis deals with the second category of stressors, although the focus is expanded to include organizational stressors such as goal quality, efficiency, autonomy, workload and opportunities for development. Relations with manager and social climate are also examined as possible stressors. The absence or presence of these stressors is referred to in this thesis as "organizational well-being." This term is based on Cox and Leiter's (1992) definition of organizational health: "Healthiness of a health care organization will be a reflection of the perceived *goodness* of its psychosocial subsystems, their coherence, and the extent to which they match organizational reality" (p. 221).

Mediators

In figure 1, the box labeled "perception and cognition" refers to the idea of cognitive appraisal described above. One can refer to cognitive appraisal as a "mediator" in this model since it is hypothesized to explain the relationship between stressors and responses (Baron & Kenny, 1986; James & Brett, 1984). Folkman and Lazarus proposed that this stage is actually divided into primary and secondary appraisal. In primary appraisal, the individual perceives a stressor as positive, negative or irrelevant. Secondary appraisal involves deciding what to do about the stressor. Since the appraisal stage is difficult to measure, many studies infer the cognitive processes that individuals go through in appraising a stressor (Kahn & Byosiere, 1992). The present thesis does not attempt to measure these processes either. Rather, job satisfaction is

seen as being closer to the appraisal process than other psychological and physiological reactions, and thus is hypothesized to be a mediator of the relationship between organizational stressors and individual health.

Moderators

In addition to mediating relationships, transactional models also frequently include "moderators" such as self-esteem, locus of control and social support (labeled "properties of the person" and "properties of the situation" in the model). Unfortunately, there is considerable confusion in the literature between mediators and moderators. James and Brett define a moderator in the following way: "a variable z is a moderator if the relationship between two (or more) other variables, say x and y, is a function of the level of z" (1984, p. 310). An example of such a relationship is a study by Pierce *et al* (1993), where workers with low self-esteem reacted more strongly to negative work characteristics than workers with high self-esteem. Thus, a moderator is different from a mediator because its presence is not necessary to explain the relationship between x and y, it only modifies the relationship. In Kahn and Byosiere's model, properties of the person and of the situation are labeled as "stress mediators." However, if James and Brett's definition is applied, as it is in this thesis, then they are to be regarded as moderators. The primary potential moderator that was examined in this thesis was self-esteem, which is considered a "property of the person".

Response to stressors

Although the fourth box in Kahn and Byosiere's model is labeled "responses to stress," I prefer to continue using the term "stressors." Responses to stressors can be divided into physiological, behavioral, and psychological outcomes (Kahn & Byosiere, 1992). Physiological outcomes include cardiovascular, biochemical and gastrointestinal responses. Behavioral reactions to stress include absenteeism, job performance, alcohol and drug use and turnover. Physiological and behavioral responses are not studied in this thesis.

Psychological reactions include such varied reactions as job satisfaction, anxiety, depression, exhaustion, fatigue, turnover intent and somatic complaints in the category psychological responses. Kahn and Byosiere hypothesized that these initial responses lead to long-term effects in the individual if they become chronic ("ramifying consequences" in the model). In this thesis, the main stressor reactions we studied were professional fulfillment (job satisfaction), mental energy and work-related exhaustion. The latter two reactions are referred to in the thesis as "individual well-being." Job satisfaction, which we have treated as a mediator of the relationship between organizational and individual well-being in this thesis, is explained in more detail below.

2.2 Job satisfaction

Job satisfaction is considered to be an affective state that comes about as a result of an interaction between a person and the environment (Locke, 1976; Jayratne, 1993). Many occupational psychologists treat job satisfaction as their final outcome of interest. However, it also fits in well with the transactional model of stress as a response that could lead to other

psychological reactions or long-term outcomes. As such, job satisfaction is also important to include in this thesis.

Jayratne distinguishes between two theories of satisfaction: the expectancy theory and the two-factor theory. The two-factor theory is primarily represented by Herzberg's motivator-hygiene theory (Herzberg & Mausner, 1959). Herzberg theorized that "motivators" (events or conditions in the work environment) leads to feelings of satisfaction. "Hygiene factors," on the other hand, were hypothesized to lead to dissatisfaction. Locke's (1976) primary critique of Herzberg's theory was that he did not clearly distinguish between categories. Furthermore, Herzberg's dualist structure was seen as limiting, and unlikely. That is, there is considerable evidence that "motivators" and "hygiene factors" could predict either satisfaction or dissatisfaction. Finally, in Herzberg's theory, the supervisor causes dissatisfaction (hygiene factor). In reality, Herzberg's theory implies that the supervisor should become the redesigner of work, and thus a contributor to increasing satisfaction (motivator factor).

The second theory of satisfaction, expectancy theory, proposes that "the individual's assessment of job satisfaction is a function of the discrepancy between what an individual expects from the job and what the individual receives" (Jayratne, 1993, p. 112). Examples of expectancy theory are effort-reward models and fulfillment theory. These models assume that individuals will be satisfied to the extent that they get what they want or that they are rewarded appropriately for their efforts.

Job satisfaction can be conceptualized as general feelings about one's job or as job facets. The variable used to test job satisfaction in this thesis was professional fulfillment, which is comprised of both general satisfaction with one's work situation, satisfaction with the quality of care one provides, feelings of pride in the organization, and intention to quit. This concept, as well as the other indicators of individual and organizational well-being used in this thesis, are elaborated on in the methods section.

3. QUALITY OF CARE

As I mentioned in the introduction, investigating the work environment of health care workers is important for several reasons, not least of all because their well-being affects their attitudes and behavior towards patients. In turn, this may well have an effect on patients' health and well-being. In effect, the quality of care provided to patients may be at stake if the work environment is not satisfactory. In this section I will provide the background for using quality of care in relationship to health care personnel's work environment. In addition, I will present a model of this relationship from the occupational health literature and propose another way of looking at it. Finally, I present two possible mechanisms to explain this relationship – empowerment and participatory decision-making. First, however, it would be helpful to define quality of care, and to look at how it has been addressed in Sweden, as well as how it can be measured.

3.1 What is quality of care?

According to Avedis Donabedian (1988), there are three aspects of quality: structure, process and outcome. Structure refers to the settings in which care is offered, including manpower, material resources and organizational structure. Process is what occurs during the care exchange. Outcome refers to the effects of the care on the receivers. In Donabedian's words, "good structure increases the likelihood of good process, and good process increases the likelihood of a good outcome" (1988, p. 1745).

Quality in health care has often been addressed with the help of quality assurance and continuous quality improvement. Quality Assurance (QA) is "that set of activities that are carried out to set standards and to monitor and improve performance so that the care provided is as effective and safe as possible" (DiPrete Brown *et al*, 1993). It focuses primarily on the *process* aspect of the Donabedian quality triad (Reerink and Sauerborn, 1996). QA is a systematic and ongoing process that can be used by health care personnel to improve quality of care for the patients. It involves personnel teams creating work standards, identifying and defining problems, testing solutions and implementing new working methods. Evaluation of the success of a solution is accomplished through the team's own monitoring of indicators throughout the implementation process.

Quality assurance has often been used interchangeably with the term "quality improvement," which refers to continuous quality improvement (CQI) in the United States (Buetow & Roland, 1999). CQI efforts also focus on processes, but they differ from quality assurance in that proponents of CQI attempt to *prevent* quality problems, and not just correct them. Methods that are stressed in CQI are serial experimentation, innovation and empowerment of employees. In order to create a culture of continuous quality improvement, many health care organizations have implemented total quality management (TQM).

The Joint Commission on Accreditation of Healthcare Organizations, based in the United States, has developed a model to monitor, identify problems, improve and evaluate health care (JCAHO, 1988). It involves ten steps:

1. Assigning responsibility;
2. Delineating scope of care;
3. Identifying important aspects of care;

4. Identifying indicators;
5. Establishing thresholds for evaluation;
6. Collecting and organizing data;
7. Evaluating care;
8. Taking actions to solve problems or improve care;
9. Assessing the effectiveness of the actions; and
10. Communicating findings to the organization-wide quality assurance program.

This model makes three assumptions: monitoring and evaluation activities are ongoing, planned, systematic, and comprehensive; data collection and evaluation are adequate to identify problems; and actions taken to solve problems are effective (JCAHO, 1988) Another assumption is that quality improvement is team-based.

3.2 Quality improvement in Sweden

In Sweden, quality improvement has been become increasingly popular since it was first officially discussed in 1989 (Palmberg, 1997). However, efforts to implement QI have often been isolated and not system-based. Therefore, in 1996 the Swedish National Board of Health and Welfare (*Socialstyrelsen*) issued a statute advising that all health care should be "quality assured." [1] The statute allows health organizations to initiate quality assurance independently of the government. Palmberg (1997) has pointed to the fact that, while some central organizations develop tools, models and methods for quality improvement, most of the implementation is done at the local level. For this reason, it has been difficult to gather evidence that these methods are having an effect.

One of the quality improvement methods that has been widely applied in Sweden in the last few years is QUL (Quality, Development, Leadership). QUL is an instrument based on the Swedish Quality Award (in its turn based on the Malcolm Baldridge National Quality Award) that has been used as a type of external audit in Swedish health care (Palmberg, 1997). QUL is primarily an instrument of evaluation, however, concerned with the identification of problem areas rather than the improvement of processes (Erlingsdottir, 1999). It can help health care planners to identify *what* they need to improve, but not *how*.

3.3 How does one measure quality of care?

In order to judge the effects of quality improvement efforts, it is necessary to measure quality. Approaches to measuring quality of care may be personnel, observer, or patient-based. Personnel-based measures include personnel's evaluation of the quality of care they provide (Arnetz, 1999) and their evaluated ability to meet family needs (Leveck & Jones, 1996). Observer-based methods include quality audits and mystery clients (Hegvary, 1976; Leveck & Jones, 1996). Patient-based methods of measuring quality of care can be divided into patient-evaluated and records-based. Patient-evaluated methods concern primarily patient satisfaction surveys (Arnetz & Arnetz, 1996), but also surveys of why patients recommend hospitals (Atkins *et al*, 1996). Records-based methods include clinical indicators such as complications (Cassard *et al*, 1994), risk-adjusted mortality (Aiken *et al*, 1998) and risk-

[1] The exact wording is: "The quality of health and dental care should systematically and continually be developed and assured. " (Socialstyrelsen, 1996).

adjusted length of stay (Shortell *et al*, 1994). Malpractice rates have also been used in at least one study of quality of care (Jones *et al*, 1988).

In this thesis, both patient and personnel-based methods of evaluating quality of care are applied.

3.4 Quality of care and the work environment

It seems logical that there would be a relationship between health care personnel's work environment and the quality of care they provide to patients. However, there have been relatively few studies conducted to test this apparent truism, and those that have been done were cross-sectional (Thomsen *et al*, 2000). Furthermore, even fewer of these studies are based on the transactional model of stress. One exception is Don Wallis (1987), an occupational psychologist who presented a plan for research on the effects of occupational stress on quality of care. This plan is presented in a diagram below (figure 2).

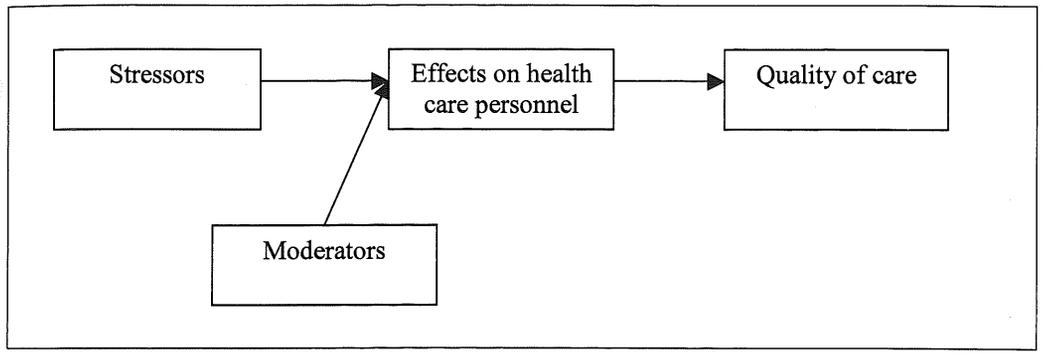

Figure 2: Occupational stress and quality of care (Wallis, 1987)

Wallis proposed that the relationship between occupational stressors and the quality of care provided to patients was mediated by the effects of stressors on health care personnel. In the category "stressors" he included job characteristics. Effects on health care personnel included their job satisfaction and health. Quality of care was measured according to patient satisfaction and health, among other outcomes. In addition, Wallis included in his model potential moderators of the stressor-outcome relationship, such as social support and coping. Wallis proposed that quality of care could be seen as an indicator of performance for health care workers. Thus, in traditional occupational psychology, quality of care would be the equivalent of measures of productivity in other industries.

Wallis' rationale for looking more closely at the work environment of health care workers was based on the growing importance of service industries, and on the special problems that health care personnel face. He included quality of care in his model as a measure of performance. One could say that the goal of his research was still traditional for an occupational psychologist: identifying a work environment for health care workers that would both improve their health and well-being and their performance. Thus, quality of care may be interpreted as secondary in this model, even though it represents the final outcome of interest.

This focus on the work environment of health care workers is in contrast to most of the studies of quality of care, which see the interests of the patients as the primary goal and improving the health care worker's work environment as secondary (Weisman & Nathanson, 1985; Shortell *et al*, 1994). This literature is built on the writings of Donabedian (1980), who has defined quality in the health care context as the extent to which the client's (patient's) interests are advanced. According to Donabedian, the health care professional is merely an advisor, who is ultimately directed by the patient. In this view, the health care professional's satisfaction is a mediator of the quality provided not an end in and of itself. Thus, had Donabedian drawn a model it would have looked the same as Wallis' but the primary interest would be different.

Empirical evidence

Wallis' model, although not always stated so plainly, can be seen in the literature on the relationship between the health care work environment and quality of care. However, I have only found five prospective studies, two of which were controlled (Weisman & Nathanson, 1985; Jones *et al*, 1988; Jones *et al*, 1997; Weir *et al*, 1997; Arnetz & Arnetz, in press).A dozen or so other studies of this relationship have also been published, all cross-sectional. Most of the studies support the relationships proposed by Wallis, although they cannot indicate causality. That is, "organisations with more highly satisfied professional staff are likely to produce higher levels of client satisfaction and better client compliance than organisations with less satisfied staff" (Weisman & Nathanson, 1985, p. 1179). For example, correlational studies have shown that "magnet hospitals" in the United States are characterized by higher levels of autonomy, control and collaboration among nurses and physicians and by lower patient mortality than matched hospitals (Aiken *et al*, 1998). However, there is a general lack of evidence that personnel's work environment has an effect on the quality of care they provide in the longitudinal studies. Jones *et al* (1988) studied 22 hospitals that implemented a stress management program with 22 matched hospitals that did not over a two-year period. Results showed that malpractice claims declined by almost a third in the experimental hospitals in the period following the implementation of the stress management program. However, the study did not include measures of the work environment. Thus, the stress management program may have impacted only on stress levels (Arnetz, 1996). In another longitudinal study, Weir *et al* (1997) found that clinical inpatient units that implemented a series of nurse manager-consultant problem-solving meetings reported better working relationships, more clarity of expectations and less alienation from work than control units. The intervention had no measurable effects on patient satisfaction, however.

Furthermore, while most of the results of these studies supported Wallis' model, not all were so straightforward. For example, in a longitudinal study of 77 family planning clinics, Weisman and Nathanson (1985) found that nursing influence on clinic policies and activities was a negative predictor of client satisfaction. That is, the more influence the nurses had, the less satisfaction with quality of care the patients expressed. Further, in a study of over 8,000 Swedish health care workers and 7,000 patients, Arnetz and Arnetz (in press) identified a negative relationship between staff perception of efficiency and patient satisfaction with the quality of care provided. These results indicate that what may be an optimal work environment for health care staff may not always be in the best interests of patients.

This conclusion may not be as counterintuitive as it seems. Several qualitative studies of health care workers' work environment have also pointed out the tension between personnel

and patient needs. In an anthropological study of palliative nursing personnel, Hansen (1995) found that although personnel complained about lacking time to spend with patients, when they had time to spare they spent it drinking coffee or discussing patients with each other. Franssén (1997), a sociologist, observed the same behavior in Swedish hospital and nursing home employees. She attributed it to the effects of socialization in the workplace, hypothesizing that there was an unwritten law on the ward that nursing personnel should devote more time to each other than to the patients. Gardell and his colleagues (1979), being psychologists, described such "avoidance behavior" almost 20 years ago as being necessary in order for personnel to stock up on reserves for the unknown problems that await them on the ward.

However one wishes to interpret the fact that personnel sometimes have to maintain a distance between themselves and patients, it seems clear that one cannot take for granted that happy personnel will always lead to happy patients. In light of this, I would like to propose another way of looking at the relationship between patient and personnel well-being.

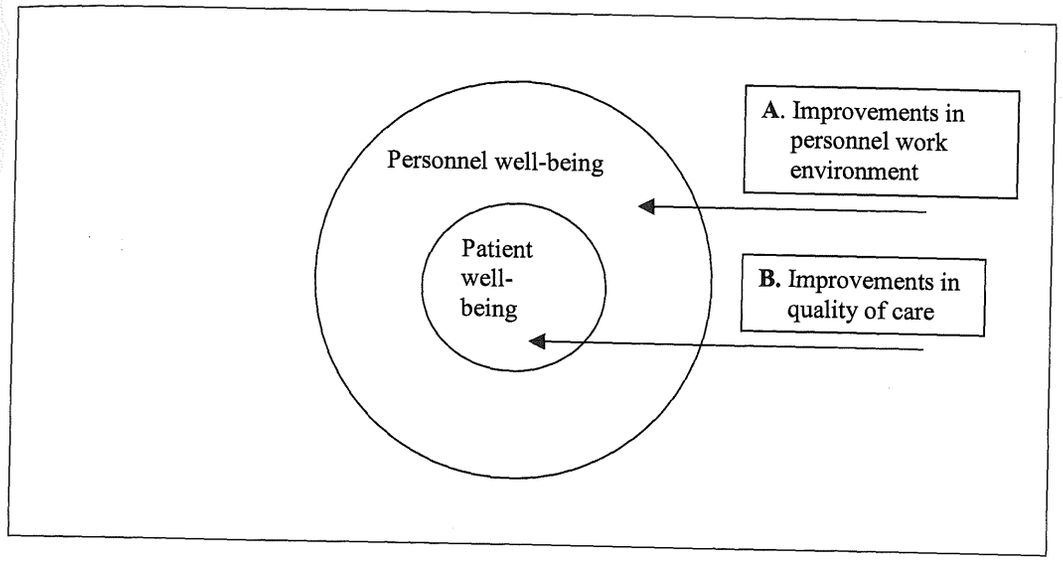

Figure 3: Proposed relationship between patient and personnel well-being

In figure 3, arrow A represents improvements in health care personnel's work environment. These improvements may or may not have an effect on patient well-being (defined as both satisfaction and health outcomes). Arrow B represents attempts to improve the quality of care provided to patients. Since patients receive care from health care personnel, these improvements are dependent on personnel well-being. Thus, I propose that improvements to personnel's work environment may or may not impact on patient well-being, but that improvements in quality of care are always dependent on personnel well-being. This figure is the basis for study three in this thesis.

3.5 *Identifying the link between the health care work environment and quality of care*

The above evidence suggests that there is a link between health care personnel's work environment and the quality of care they provide, although clearly more research needs to be done. In addition, it is still necessary to explain the mechanisms behind this link. That is, what factor or factors are mediating this relationship? In this thesis, the primary interest is to explore this link in terms of quality improvement processes. The above literature does not attempt to explain this relationship. Instead, we have to turn to either the quality or the job satisfaction literature. This literature leads us to two possible theories of why quality improvement programs are beneficial for both patients and personnel: empowerment and participative decision making.

Empowerment

Before the management and occupational psychology literature discovered it, the term empowerment was primarily used in relation to community mobilization (Freire, 1970). Rappaport defined empowerment as, "the mechanism by which people, organizations and communities gain mastery over their lives" (1984, p.3). Zimmerman likened empowerment to "learned hopefulness; a process of learning and utilizing problem-solving skills and the achievement of perceived or actual control" (1990, p. 72). He proposed that experiences that increase one's sense of control will also help one to cope better with stress, but that actual control may not be necessary since this may not be the goal for all communities (Zimmerman, 1995).

In the hands of the occupational psychologists, the term was redefined as "psychological empowerment." This precision can be seen as an attempt to separate objective and subjective empowerment (Conger & Kanugo, 1988). The principle behind "objective empowerment," which is primarily visible in the management literature, can be illustrated in the following statement: "I give you power, therefore you are empowered." In the psychology literature, however, individuals are empowered when *they* perceive that they have the power to cope with events and people (Thomas and Velthouse, 1990; Spreitzer, 1995).

As proponents of the latter definition, Thomas and Velthouse (1990) saw empowerment as being composed of four components or cognitions: *self-determination* (or autonomy), *meaning*, *competence* (or self-efficacy) and *impact* (degree of control over the situation). In their opinion, the success or failure of participative management techniques should be judged on these cognitions (Spreitzer, 1995). That is, does the employee see the tasks as meaningful? Does the employee feel herself to have necessary competencies, including problem solving skills, and are suggestions and decisions supported by top management? The essence of this perspective, as in Conger and Kanugo's work, is that empowerment does not simply result from giving "power" to employees, but from employees' own perceptions that they are empowered.

Quality of care and empowerment

Much of the quality literature ignores the "psychological" aspect of empowerment. Instead, it emphasizes the role of empowerment in motivating personnel to take more responsibility

(Willmott, 1994; Johnson, 1997). This literature is almost exclusively from the early 1990's, when quality improvement schemes were at their height in industrialized countries, and overwhelmingly anecdotal. The authors of this literature propose that nurses (the primary target group of the quality literature) should have increased responsibility in order to "foster a climate of achievement in which *action, initiative,* and *risk* are sanctioned" (Methot *et al*, 1992, p.14). Another claim is that "increased job satisfaction is also obtained through increased ownership and commitment to improve and maintain quality patient and family outcomes" (Thrasher *et al*, 1992, p.19). Dveirin and Adams (1993) proposed that "work structured on the basis of compliance rather than empowerment forces people to shrink to fit their jobs" (p.222). Finally, Rose and DiPasquale (1990) wrote that shared governance nursing is based on the assumption that "true empowerment of staff nurses involves holding nurses individually accountable for practice" (p.87). Thus, it seems that for these authors "empowerment" is a euphemism for increased responsibility.

It is perhaps not surprising that the management literature found empowerment theory a logical way to describe why quality improvement techniques improved staff morale since these methods emphasize "individual responsibility" (Roberts, 1993), and "[acting] more independently" (Shortell, 1995). However, empowerment as a motivator has been under fire during the last few years, primarily because of its association with downsizing and "lean" production methods such as business process reengineering (Willmott, 1994; Parker & Slaughter, 1995; Johnson, 1997; Landsbergis *et al*, 1999). Parker and Slaughter (1995) proposed that words like teamwork, empowerment and job security were "co-opted" by proponents of lean production who were not really interested in the welfare of the workers. Instead, they suggested that "lean" production is actually a form of "management by stress," where every weak link in a chain is immediately exposed to management in order to reach production targets that are continuously stepped-up. The authors described management by stress as being different from management only "in the methods used to gather workers' knowledge. Today, workers are expected to willingly turn over their job-knowledge and even to seek out new ways to speed themselves up" (p. 49). Because of the lack of evidence for empowerment as an explanatory mechanism, it seemed prudent to search for another explanation for the link between quality improvement processes and health care personnels' work environment. One possibility is participative decision-making.

Participative decision-making

Participative decision-making (PDM) has been defined as "joint decision-making," where more than one individual takes responsibility for making decisions about organizational processes (Locke & Schweiger, 1979). PDM has been explained with affective, cognitive and contingency models (Miller & Monge, 1986). The primary goal of supporters of the affective model of PDM (also called the "human relations model") is to improve worker satisfaction. This is hypothesized to occur through the fulfillment of individuals' needs (such as respect and self-expression). In turn, satisfaction is hypothesized to lead to increased motivation, and increased motivation to improve worker productivity (Miller & Monge, 1986).

Cognitive theories of PDM, on the other hand, seek mostly to increase productivity. Satisfaction is merely a by-product that eventually ensues when the worker has knowledge of the results to which his decisions have led. In this model, PDM is thought to increase the flow of critical information from the worker to management, thus allowing more appropriate decisions to be made. Further, the processes involved in PDM are proposed to increase the

level of understanding in the worker, thus motivating him to work harder (Locke & Schweiger, 1979; Miller & Monge, 1986).

Finally, Miller & Monge cite a third model explaining the mechanisms behind PDM: the contingency theory. This theory is based on the idea that effects on the individual are contingent on other factors in the individual (such as personality) and in the workplace. Thus, PDM may only increase job satisfaction if the individual has a great enough desire to participate.

Miller and Monge's metanalysis indicate that there is little support for contingency theories, and some support for cognitive theories. The data are most supportive of affective theories. Thus, a participative climate is strongly related to satisfaction at work. Glass and McKnight (1996) have also found evidence for a negative relationship between PDM and burnout. Regardless of the empirical evidence, Macy *et al* (1989) cite a growing shift from the human relations (affective) rationale for using PDM to reasons of production and efficiency, claiming that the majority of projects implementing PDM today are done for this latter reason.

Quality of care and participative decision-making

PDM has been used as a mechanism to explain the relationship between quality improvement and the work environment, although it is not as apparent in the quality literature as the concept of empowerment. Those quality studies that do include measures of PDM are primarily from the human relations (affective) school (Steel & Lloyd, 1988). Thus, for example, Schauenbroeck & Jennings (1991) proposed that PDM (through quality circles) leads to job satisfaction through decreased role ambiguity. The results of their study partially supported this hypothesis but the relationship was also partially mediated by an increase in information. Buch (1992) found that quality circles decreased "boundary permeability" by increasing clarity of goals and clarifying role definitions for group members.

The above studies linking quality and PDM used quality circles as their intervention. This is most likely due to the preponderance of quality circles in the early 1990's. However in a more recent review of the literature, Cordery (1996) found little evidence that quality circles had significant effects on employee work environment.

Following the development of quality theorists, TQM was also proposed to improve job satisfaction through an increase in knowledge, participation and personal autonomy. However, these claims have rarely been supported by empirical data (Kivimäki *et al*, 1997). Landsbergis *et al* (1999) reported that studies of methods that employ elements of TQM, such as patient-focused care, have resulted in job satisfaction, but only when they were not accompanied by downsizing. This is presumably because these systems emphasize personnel influence and participative decision-making techniques rather than lean production. At the same time, they are, by definition, ultimately concerned with patient, rather than personnel outcomes. I have found no prospective, controlled studies linking work environment and quality of care that look at satisfaction from both personnel and patient perspectives.

In summary, there is sufficient cross-sectional data, and insufficient longitudinal data, to prove or disprove Wallis' model. That is, there seems to be a relationship between personnel satisfaction and patient outcomes, but other explanations have not been ruled out. Furthermore, there has been little research done on the mechanisms behind this relationship.

In this thesis, I attempt to address this lack of research. My starting point, as presented in figure three, is that improvements in quality of care will not be successful without addressing work environment issues.

4. METHODS

The seven papers in this thesis are based on three separate studies:

Study 1: The Swedish-English Psychiatric Study (SEPS) - 1996
Study 2: An internal work environment survey of the health district of the Psychiatric section of Southern Stockholm and telephone follow-up – 1997
Study 3: Quality of care and working life ("Vård- och arbetslivsutveckling" - VALU) – 1998-2000

Papers I-III and V-VI were based on data from study one. Paper IV was based on data from study two. Paper VII was based on study three. The methods used in these studies are described in detail below.

4.1 Designs

Studies one and two had cross-sectional designs, where it was not possible to identify individuals, and employed mailed, self-administered questionnaires. In study two we also used telephone interviews. Study three was a controlled, prospective study. It was not possible to identify individuals here either. Thus, the data were repeated cross-sectional. Study three involved an intervention designed to improve quality of services in one department of a hospital. We conducted pre and post-tests in the intervention department and in a control department to test for effects of the intervention. The study used self-administered questionnaires, focus group discussions and semi-structured interviews to measure processes and outcomes (figure 4).

	Time 1 (month 1)	**(month 6)**	**(month 9)**	**(month 17)**	**Time 2 (month 18)**
Group 1 (intervention)	Q	X	IM	IM, FGD	Q
Group 2 (control)	Q		IM	IM, FGD	Q

Q = Measurement with questionnaires
X = Beginning of intervention period
IM = Interviews with managers
FGD = Focus group discussions

Figure 4: Design of study three

4.2 Subjects

Study one was a survey of all psychiatrists and psychiatric nurses in the County of Stockholm, Sweden (n=1,554) and of a random sample of the equivalent personnel categories in the West Midlands (Birmingham), England (n=785). Response totals and rates for nurses and physicians in each separate country, and together, are presented in table 1.

Table 1: Response totals and rates for study one.

	England		**Sweden**		**Total**	
	n	**%**	**n**	**%**	**n**	**%**
Nurses	296	*45*	720	*68*	1.016	*58*
Physicians	74	*60*	320	*69*	394	*67*
Total	370	*47*	1.040	*67*	1.410	*60*

The study population of study two consisted of all employees of the psychiatric section of the health district of Southern Stockholm (n=693) and of a random sample of 10% of this group (n=71) for the telephone follow-up. The response rate for the postal survey study was 51% (n=356). The effective sample size for the telephone survey was 47 (94% of those who could be reached and who agreed to be interviewed).

Study three subjects were comprised of personnel and patients at two hospital departments. The control group was the geriatrics department and the intervention group was the surgery department. Table 2 provides the number of respondents at both time points in both departments. Since it was not possible to follow individuals over time, participants at time two answered a question as to whether or not they were employed at time one. Only those that had been were included in the analyses. This is why the numbers are smaller at the post-test.

Table 2: Response rates for ***personnel*** in study three for intervention and control groups at pre and post-tests.

	Time 1			Time 2		
	Employed (n)	Responded (n)	**Response rate (%)**	Employed time 1 (n)	Responded (n)	**Response rate (%)**
Intervention group	175	132	**75**	126	93	**74**
Control group	127	101	**80**	75	58	**77**
Total	302	233	**77**	201	151	**75**

At the same time that the personnel were surveyed, all patients who visited the departments for care during a two-week period were offered a questionnaire with questions about the quality of care they received at the department. The number of potential patients and respondents are presented in table 3. Non-response includes those who were offered a questionnaire, but chose not to take one (Ehnfors & Smedby, 1993; Arnetz & Arnetz, 1996).

Table 3: Response rates for ***patients*** in study three for intervention and control groups at pre and post-tests.

	Time 1			Time 2		
	Eligible (n)	Responded (n)	**Response rate (%)**	Eligible (n)	Responded (n)	**Response rate (%)**
Intervention group	390	224	**57**	374	213	**57**
Control group	138	82	**59**	165	86	**52**
Total	528	306	**58**	539	299	**55**

4.3 Measurement

Information in study one was gathered with the help of self-administered questionnaires. Study two was based on self-administered questionnaires and telephone interviews. In study three we used self-administered questionnaires, focus group discussions and semi-structured interviews.

Questionnaires

The questionnaires were based on earlier studies of health care personnel's work environment (Arnetz, 1996; Arnetz, 1997; Pettersson & Arnetz, 1997). The questionnaires can be divided into background questions, personality questions, questions on individual well-being and questions on organizational well-being (table 4). Background questions, as well as scales based on questions on personality and organizational well-being, were used as independent variables. Scales formed with questions on individual well-being were considered as dependent variables.

Questions on background variables in study one included age, sex, professional category (physician or nurse), years worked in the organization, having a child under 16 at home, having primary responsibility for that child, being a smoker, alcohol consumption, number of sick days taken in the previous year, and experience with violence or threats of violence at work in the last year or in one's lifetime. Of these questions, only the first four were included in the subsequent studies, primarily because the other questions were not found to have significant effects on the dependent variables relative to questions on personality and organizational well-being.

Questions on personality include the Rosenberg self-esteem scale (Rosenberg, 1965) and active coping (Pettersson & Arnetz, 1997). Self-esteem was included on the questionnaires in studies one and three. Coping was only used in study one.

Table 4: Description of scales used in papers I-VII

Scale	Description	No of items	Range	Paper	Reference
Personnel questionnaire					
Self-esteem	*Satisfied with myself, no good at all, number of good qualities, able to do things as well as others, not much to be proud of, feel useless at times, person of worth, wish could have more respect for myself, feel am failure, positive attitude towards myself*	10	1.0-4.0	I-III, V	Rosenberg, 1965
Active coping	*Deal with too much work? Draw up action plan, take as a challenge and find solutions, concentrate on one step at a time*	3	3-12	I-III	Pettersson & Arnetz, 1997
Autonomy*	*High degree of autonomy, authority to complete duties, can plan working day, amount of influence over job and situation*	4	4-15	II-III, VI	Developed in study 1
Efficiency*	*At my work place we: plan our work, work towards a common goal, have functioning decision-making processes*	3	3-14	I-III, V-VII	Arnetz, 1997
Goal quality	*Goals of my organization (if known): are clearly expressed, are realistic, can be evaluated, are possible for me to influence*	4	4-16	I-III, VII	Pettersson & Arnetz, 1997
Influence	*Able to influence decisions at work, have amount of influence at work I want, have information I need to influence work*	3	3-11	VII	Developed in study 3
Involvement	*Support line manager, support managerial decisions, assist in managerial policies, assist in implementing policies, committed to improving work practices, flexible at work, participate in innovative practices to improve work efficiency*	7	7-28	I	Developed in study 1
Relations with manager* (Leadership)	*Get on well with superiors, have support of manager, get clear information from manager, functioning decision-making processes*	4	4-18	I-III, IV-V	Arnetz 1997; Arnetz 1999
Leadership	*My immediate supervisor: clearly communicates, acts consistently, has specified how we will reach our goals, creates possibilities to do a good job, is open for changing how we work*	5	5-20	VII	Developed in study 3
Participation	*Have influence I want, can comment on information from manager, receive feedback on good job, can plan working day*	4	4-17	I, IV	Developed in study 1
Personal development	*Opportunities to learn, job stimulates me, have opportunity to apply new knowledge in daily work*	3	3-12	II, III	Developed in study 1
Work (social) climate	*Pleasant atmosphere at work, colleagues are supportive, get along with superiors, we work well as a team*	4	4-16	I-III, VII	Undèn, 1996
Work load	*How hard must you work, how often do you finish your duties during normal working hours, how often job requires too much work*	3	3-13	I-V, VII	Karasek & Theorell, 1990
Mental energy*	*How often do you experience restlessness, irritation, depression, anxiety, difficulties concentrating, listlessness*	6	6-30	I-III, V-VII	Arnetz, 1997
Professional fulfillment*	*How satisfied with job situation, seriously considered quitting in last year, proud of working in organization, satisfied with quality of care you provide, rating of quality of care organization provides*	5	4-17	II-III, IV-VII	Developed in study 1
Work-related exhaustion*	*How often feel emotionally exhausted after work, physically worn out after work, tired at thought of work*	3	3-15	II-VII	Developed in study 1

*Scales altered in paper VI after confirmatory factor analyses in paper V.

Table 4 (cont)

Scale	Description	No of items	Range	Paper	Reference
Patient questionnaire					
Care processes	*Have staff: had time for you, introduced themselves to you, offered support when you needed it, been responsive to your needs/requests*	4	4-16	VII	Arnetz & Arnetz, 1996
Personnel work environment	*Positive work climate among staff, staff work under stress, staff find work stimulating, staff have a heavy work load, staff assume responsibility and are engaged in their work, staff have a positive attitude toward work, health care is characterized by cooperation among staff, health care is effective, all staff work toward the same goal – good care for the patient*	9	9-36	VII	Arnetz & Arnetz, 1996
Staff attitudes	*Received friendly reception at hospital, taken care of when first came to ward/clinic, staff taken you seriously, felt that staff had time for you*	4	4-16	VII	Ygge & Arnetz, manuscript

Questions on organizational well-being were formed into nine scales, based either on previous empirical studies or on the literature. These scales measured efficiency, personal development, autonomy, participation, goal quality, workload, relations with manager (leadership)[2], involvement and social climate. An additional scale measuring influence, and a new measure of leadership were used in study three. Table 5 provides the intercorrelations and the reliability estimates (Cronbach alphas) for the nine scales included in study one.

Table 5: Intercorrelations (r) and reliability estimates (Cronbach's alpha) of scales measuring organizational well-being, based on SEPS/Sweden data

	auto-nomy	goal quality	effic-iency	work climate	relation with mgr	partici-pation	develop ment	involve ment	work load
autonomy	(.76)								
goal quality	.40	(.81)							
efficiency	.40	.53	(.73)						
soc climate	.40	.33	.53	(.76)					
relate mgr	.37	.50	.60	.64	(.76)				
participatin	.74	.45	.43	.50	.66	(.64)			
developmnt	.41	.32	.36	.30	.31	.35	(.86)		
involvement	.40	.48	.43	.38	.47	.45	.38	(.83)	
work load	-.14	-.06	-.08	-.20	-.13	-.13	.11	.06	(.75)

Reliability estimates of internal consistency (Cronbach's alpha) are entered in parentheses.

Questions on individual satisfaction and well-being were formed into three scales measuring professional fulfillment, mental energy and work-related exhaustion.

Questions to patients in study three were formed into scales measuring patient experiences with care processes, personnel work environment, staff attitudes, participation in treatment, medical care, information on routines, information on illness and accessibility (Arnetz &

[2] The scale "relations with manager" was termed "leadership" in papers I-III. However, this name was changed in papers V and VI (although the items were unchanged) because we felt it did not reflect the items in the scale. A new "leadership" scale was developed for study three (paper VII).

Arnetz, 1996). Because of high internal non-response, however, only the first four scales were used in paper VII. Additionally, a question on the patient's overall rating of the quality of care received was included.

Focus group discussions

In study three, five focus group discussions, with five participants in each group, were carried out with personnel in both the intervention and control departments in order to obtain information on group processes and feelings on quality work. A question guide was designed by the principal researcher in order to structure the discussion. However, the researcher also encouraged spontaneous discussions of subjects that arose from these questions if they had relevance for the topic of discussion (Krueger, 1994).

Semi-structured interviews

Processes in study three were also measured with the help of semi-structured interviews with ward/clinic managers and upper management. The questions were designed to elicit information changes in personnel and routines since the last contact. Additionally, we sought information about the types of quality work that had been initiated during this period.

4.4 Procedures

In order to obtain the address lists for study one, we first contacted all of the heads of the psychiatric districts of the County of Stockholm (*chefsöverläkare*). They provided us with the names and employment addresses of all of their active employees. Each employee received a copy of the questionnaire, a letter from the researchers ensuring confidentiality and the possibility to decline to participate, a letter from the head of the nurses' or physicians' union indicating support for the project, and a self-addressed, stamped envelope. Since we did not track individuals, reminders were sent to *all* employees twice at two-week intervals. Data were entered into the SPSS statistical package by the principal investigator and a private individual was contracted to document all of the open-ended questions. Virtually the same procedure was carried out in the English study. A summary of results for each psychiatric district was sent to all of the contact people in the district (administrators, head physicians, personnel heads). Additionally, a copy of the first published article (paper I) was sent to the participating workplaces of all of the physicians.

The same procedure was implemented in the postal survey part of study two except that, since it was an internal project within one psychiatric district, the surveys were sent internally to all of the employees in the organization. In addition, only one reminder was sent after two weeks, and data collection ceased after four weeks. For the telephone survey, which was initiated 10 weeks after the postal survey ended, we obtained a randomized list of 10% of the total population of employees from the personnel office. The principal investigator phoned all of the employees on the randomized list at their place of work. Additional details about the procedures for the telephone follow-up are provided in paper IV.

Details on the procedures involved in carrying out study three are also available in paper VII. Briefly, the researchers contacted the administration of the study hospital and asked if they

wanted to participate in the study. Meetings were held in order to cover all of the details of the implementation of the project. It was decided that the researchers would not implement any part of the intervention themselves, or hire any consultants to do so. Rather, the hospital would carry out their own trainings as they had already planned, and the researchers would merely observe and evaluate. Thus, the study was naturalistic in design. The principal investigator visited each ward, in both the control and intervention departments, and informed personnel of the goals and methods of the project. Surveys were carried at three time points, although only two are reported in paper VII. After each survey, the principal investigator visited each ward again and presented the respective ward's results on both the personnel and patient surveys. Personnel were also offered the chance to comment on the results and ask the researcher questions. A written report on the results of each ward and department was also provided after each measurement.

Participants in the focus groups in study three were recruited through the heads of each department. The potential participants were sent a letter asking for their consent in participating in the focus group discussion. This was followed up by telephone call. Focus groups were held in a quiet room in the hospital for 1 to 1 ½ hours in the afternoon. Coffee was provided. Focus group discussions were recorded on tape and then transcribed by administrative personnel. After I had summarized the focus groups, I sent them to the participants and asked their permission to include their quotes in the report (Krueger, 1994). Finally, I presented a written report (in Swedish) on the results of the focus groups to hospital management.

4.5 Analyses

Statistical analyses

Questionnaire data were analyzed with the help of the statistical package SPSS (versions 6.1, 7.5, 8.0 and 9.0), and with LISREL (version 8.2). Correlations were analyzed with either Pearson's product-moment correlations, or with Spearman's rank order correlations (if data were not normally distributed). Differences between means with continuous and ordinal data were tested with student's t-tests, one- and two-way ANOVAs, and ANCOVAs (when controlling for a covariate). Differences in categorical responses were tested with chi-square.

Predictors of the dependent variables, as well as explained variance, were identified with stepwise multiple regression. Logistic regression was used in paper II to calculate relative risks.

Scales that were not normally distributed were logged before testing with methods that assume normality, and significance was set at 0.05.

The scales used in papers I-IV were developed/checked with exploratory factor analysis methods and with Cronbach alpha. In papers V and VI scales were tested with confirmatory factor analysis using LISREL. LISREL was also used in paper VI to test the mediational model.

Analysis of focus group discussions

The following steps were followed in analyzing this data: transcribing, listening to the tapes while reading the transcriptions, reading the interviews one at a time, looking for emerging themes, developing coding categories, sorting data into categories based on the research question and preparing the draft report (Krueger, 1994).

Morse and Field (1995) identify four cognitive processes in analyzing qualitative data: comprehending, synthesizing (decontextualizing), theorizing and recontextualizing. Comprehending the data is achieved both through collecting the data and coding it. Synthesizing the data involves "getting a feel" for it by aggregating data from different groups or from different segments of an interview. Theorizing involves "fitting" the models to the data, including considering alternative explanations. Finally, recontextualizing involves developing the theory and extending it to other situations, including other examples in the literature.

The method used here for analyzing the data from the focus group discussions was based on these authors' suggestions, but also on Coffey and Atkinson's (1996) more detailed explanation of the coding and interpretation process. The first step is displaying the data. In this step data are coded and categorized freely. Coding can also be seen as decontextualizing, in that data are reduced into meaningful portions. The second step involves exploring these codes and categories. This is where re-interpretation and recoding may be necessary. Finally, the codes are transformed into concepts, which could be developed from theories or from the research question.

4.6 Ethical considerations

Study one was waived by the Regional Ethical Committee of Stockholm because it was considered a work environment study and because of its cross-sectional design (96-248). The Local Ethical Committee of Southern Stockholm (Dnr 240/98) approved study three. Study two was an internal study commissioned by the Health County of Southern Stockholm.

5. SUMMARY OF PAPERS

The seven papers included in this thesis are based on the three studies outlined above.

5.1 Paper I

Thomsen S., Dallender J., Soares J., Nolan P. & Arnetz B. (1998). Predictors of a healthy workplace for Swedish and English psychiatrists. *British Journal of Psychiatry* 173, 80-84.

Aims: To identify organizational and individual aspects contributing to a healthy workplace for psychiatrists. To identify differences between English and Swedish psychiatrists.

Methods: Cross-sectional. Three hundred and eighty psychiatrists from Stockholm and Birmingham responded to a previously tested questionnaire. Data were analyzed with Pearson product-moment correlation, Spearman's rank correlation, Chi-square tests, one-way ANOVAS and stepwise multiple regression.

Results: Predictors of a healthy workplace for psychiatrists were: high self esteem, satisfactory support with work-related problems, lower perceived workload, positive view of leadership, low work-related exhaustion and having a sense of participation in the organization. Self-esteem was the primary explanatory variable for mental energy and health in the last month. Perception of leadership and satisfaction with support with work-related problems were the variables most highly correlated with satisfaction and work-related exhaustion. The English psychiatrists were younger, worked longer hours, were more likely to have a supervisory position, more satisfied with their salaries, and rated their organizations higher in terms of quality of goals, social climate and level of involvement.

Conclusions: Both individual and organizational factors are important for the psychosocial work environment of psychiatrists. A positive view of leadership and satisfaction with support with work-related problems are important predictors of satisfaction and health. Efforts should be made to provide management with better leadership skills.

5.2 Paper II

Thomsen S., Soares J., Nolan P., Dallender J. & Arnetz B. (1999). Feelings of Professional fulfilment and exhaustion in mental health personnel: The importance of organisational and individual factors. *Psychotherapy and Psychosomatics* 68, 157-164.

Aims: To identify the contribution of organizational and individual characteristics to feelings of professional fulfillment and work-related exhaustion among Swedish psychiatrists and mental health nurses. To identify differences between psychiatrists and mental health nurses, and between men and women in this population.

Methods: All psychiatrists and mental health nurses (n=1,051) in the city of Stockholm were sent a questionnaire to their workplace. Statistical methods used include one-way ANOVAS, chi-square tests, and multiple and logistic regression.

Results: Experiencing high levels of goal quality, efficiency and personal development increased the likelihood that the individual would feel professionally fulfilled at work by 2.3 to 2.9 times. Individuals who felt less professionally fulfilled were five times more likely to experience high levels of work-related exhaustion than those who were moderately to very professionally fulfilled. In addition, some significant differences between professional groups and gender were observed. Psychiatrists experienced more discrimination, a greater workload, lower social climate, and more work-related exhaustion than mental health nurses. On the other hand, psychiatrists also experienced greater possibilities for personal development. Female employees reported lower self-esteem, goal quality, personal development and autonomy than male personnel. In addition, female employees experienced more work-related exhaustion than male staff.

Conclusions: Organizational characteristics seem to be more important than individual characteristics in predicting exhaustion and professional fulfillment in Swedish mental health professionals. The most important factors for individual well-being in this study were professional fulfillment and workload. Focusing on these variables may have a positive effect on individual well-being for psychiatric health care personnel in Sweden.

5.3 Paper III

Thomsen S., Arnetz B., Nolan P., Soares J. & Dallender J. (1999). Individual and organizational well-being in psychiatric nursing: a cross-cultural study. *Journal of Advanced Nursing* 30(3), 749-757.

Aims: To identify and describe possible differences between the psychosocial work environments of English and Swedish mental health nurses, and to attempt to explain these differences.

Methods: Cross-sectional. A total of 1,016 psychiatric nurses from Stockholm and Birmingham responded to a postal questionnaire. Statistical methods used were Pearson product-moment correlation, Spearman rank correlations, Chi-square tests, Student's t-tests and regressions

Results: The English nurses rated their organizations more favorably in terms of autonomy, efficiency, work climate, leadership, goal quality, development and work load, but Swedish psychiatric nurses reported greater individual well-being. In order to investigate these seemingly counter-intuitive results, we carried out multiple regression analyses. These analyses indicated that self-esteem was an important explanatory factor for mental energy and work-related exhaustion, but less so for professional fulfillment, which was predicted primarily by organizational factors such as efficiency-leadership, work climate, personal development and autonomy. Repeating the ANOVAS, and controlling for self-esteem, which was higher among the Swedish nurses, revealed no differences in professional fulfillment and mental health between the two groups.

Conclusions: Swedish psychiatric nurses experienced greater individual well-being than English nurses. At the same time, they were more critical towards their organizations than their English counterparts. This may be due to a difference in self-esteem levels between the two countries. The study points to the importance of both organizational and individual variables in predicting the well-being of psychiatric personnel.

5.4 Paper IV

Thomsen S. (2000). An examination of non-response in a work environment questionnaire mailed to psychiatric health care personnel. *Journal of Occupational Health Psychology* 5(1), 204-210.

Aims: The aim of this study was to provide an estimate of non-response error in a self-administered survey concerning the work environment of psychiatric health care personnel.

Methods: A random sample of 10% of the original survey population (n=693) was selected to participate in a telephone follow-up of a postal survey that had a response rate of 51%. Statistical methods used were Pearson's chi-square and Student's t-tests

Results: There were no differences between the responders and non-responders to the postal survey on the exposure or outcome variables. Additional calculations indicated that approximately 5% of the non-response was likely due to incorrect address lists.

Conclusions: There was no evidence of non-response bias in this study. Thus, the results may be generalized to the whole study population. The study shows that it is possible to do a non-response study with data that are not personalized. It also indicates that low response rates are not necessarily indicative of selection bias.

5.5 Paper V

Thomsen S., Aish A.-M., Arnetz B., Soares J. & Nolan P. A confirmatory factor analysis of seven scales used in psychosocial work environment studies of health care personnel. (Manuscript)

Aims: The purpose of this study was to test the dimensionality of seven existing measurement instruments used in psychosocial work environment studies (*mental energy, self-esteem, professional fulfillment, work-related exhaustion, work load, relations with manager* and *efficiency*), and to obtain information on the validities and reliabilities of the individual items in the instruments.

Methods: Confirmatory factor analyses with LISREL were used to cross-validate measurement models derived from previous empirical analyses and to test new measurement hypotheses. Data were based on the questionnaire responses of 720 (550 after listwise deletion) psychiatric nurses employed in the County of Stockholm, Sweden.

Results: Overall, the one-factor models, as derived from earlier studies, did not fit when subjected to confirmatory factor analyses. Instead, in all but one model (*relationship with manager*), it was necessary to remove an item or re-specify the model with more than one factor. Models that were found to be bi- or multidimensional were professional fulfillment (satisfaction with work and satisfaction with quality of care), and self-esteem (two positive and two negative dimensions). The validities of the items were generally good, the majority being over 0.75. Reliabilities of the items were not as high, with slightly over half being under 0.70.

Conclusions: The identification of several non-unidimensional scales, including Rosenberg's self-esteem scale (1965), points to the importance of confirming exploratory techniques. This indicates that these scales should be rethought. Ideally, new questions should be tested in conjunction with these scales in order to improve their quality.

5.6 Paper VI

Thomsen S., Aish A.-M. & Arnetz B.B. Modeling the relationship between organizational and individual well-being: the role of mediational variables. (Manuscript.)

Aims: To investigate whether job satisfaction and satisfaction with the care one provides, are mediators in the relationship between organizational and individual well-being. Relationship with manager, autonomy and efficiency are proposed as organizational attributes that have effects on satisfaction with work and satisfaction with quality of care. Satisfaction with work and satisfaction with quality of care, in turn, are proposed to affect mental energy and exhaustion in the individual.

Methods: The LISREL structural equation modeling package was used to test this model using polychoric correlations combined with the weighted least squares estimation method. 720 psychiatric nurses (642 after listwise deletion) in the County of Stockholm responded to a postal survey.

Results: As hypothesized, organizational attributes have indirect, but not direct effects, on individual well-being, through the mediator satisfaction with work. Satisfaction with the quality of care one provides is not a mediator of the relationship between these organizational and individual attributes. However, it does mediate the relationship between relations with manager, efficiency and satisfaction with work. In the final model, 25% of the variance in work-related exhaustion, 41% of the variance in mental energy, and 68% of their covariance are explained .

Conclusions: The analyses indicated that satisfaction with work mediates the effect of organizational attributes on individual well-being. This study illuminates the importance of job satisfaction for health.

5.7 *Paper VII*

Thomsen S. & Arnetz B.B. The effects of a quality improvement program on personnel and patients: a controlled, prospective study. (Manuscript)

Aims: To evaluate the effects of a TQM-inspired intervention on both patients and personnel health and well-being. Increased personnel satisfaction was proposed to be due to greater perceived influence through decision-making. Patient satisfaction was hypothesized to increase due to improvements in both personnel satisfaction and the care environment.

Methods: A controlled, prospective study with repeated cross-sectional data. Data were derived from self-administered questionnaires to personnel and patients in two departments of a hospital. Time one data consisted of 302 personnel and 472 patients. Time two data were comprised of 201 personnel and 299 patients. The intervention was designed to implement quality improvement teams in the intervention group. Mean differences between time one and time two in the control and intervention groups were compared with Student's t-tests. The researchers conducted focus group and individual interviews, as well as observations, in order to monitor the intervention process.

Results: In the control group, staff perception of the social climate at their workplaces increased and work-related exhaustion decreased. Work-related exhaustion increased in the group that actually implemented the intervention as planned ("compliers"), as opposed to the "non-complier" and control groups. Those who indicated that they worked in quality groups also experienced more work-related exhaustion and less mental energy at time two than those who did not work with quality and those who worked with quality in other ways. There were no changes over time and group in patient evaluations of care.

Conclusions: Since changes occurred in both the control and intervention groups, the intervention can be said to have had no effects on either patients or personnel. However, since the intervention never really reached the level intended, it is difficult to draw conclusions about this study. More prospective, controlled studies are needed to illuminate the relationship between personnel and patient health and well-being.

6. ADDITIONAL FINDINGS

In this section I present some additional interesting findings from study three, the controlled, prospective study in a hospital department that were not included in paper VII.

6.1 *Physician involvement in improving quality of care*

In paper VII, we reported that physicians in the surgery (intervention) department did not attend the quality training with the rest of the staff. In my observations and interviews at the project hospitals, I had the impression that physicians were not an integrated part of the wards. They did not seem to attend workplace (ward/clinic) meetings, they were not formally employed under the wards, and they seemed to show very little interest in the quality initiative that the hospital leadership had espoused. In short, it seemed to me that physicians acted as consultants to the organization, and, as such, were uninterested in the larger picture outside of their immediate sphere of responsibility. Since I am convinced that lasting improvement efforts are impossible to achieve without the full cooperation and interest of the entire medical profession, I felt it was worthwhile to explore these initial impressions.

Focus group discussions with physicians

Towards the end of the project, I carried out two focus group discussions with physicians, one in each department (geriatrics and surgery); and each was comprised of five physicians. The primary criterion for inclusion in the group was that the physician had to have been employed in the department since at least the beginning of the project (18 months). I also strove for diversity in terms of age and gender in the groups, although the former was difficult due to younger doctors' greater mobility. The two groups consisted of four women and six men, of which three individuals were residents. The average length of time that these physicians had been employed at the department was 14 years. The least amount of time employed at the department was two years and the longest was 31 years.

The topics discussed with the two groups of physicians can be divided into two categories: influence and quality. The questions in the first category concerned how much influence they have over the workings of the department, how much they would like to have, and how much affiliation they feel with the wards/clinics. The second group of questions concerned physicians' opinions on quality improvement, including how often they initiate improvement work. The results of the discussions with the two groups of physicians are presented together. However, if one group differed in its perception of the situation then that group is identified.

Physicians' perceived influence

The physicians interviewed differentiated between two levels of influence: the medical and the administrative level. They also differentiated among different structural levels: one's own work, the ward, the hospital and the county council. The general feeling was that physicians have influence over medical decisions and "one's own work". Physicians in the geriatric department felt that they could participate in decision-making at the ward level, if they had the energy and if they had a good head nurse to work with:

"I also feel like I have a great deal of freedom. I have my stuff that we are going to start with down in the out-patient clinic that I feel I have a free hand to develop."

The physicians interviewed in the surgical department, however, did not share this feeling of participation at the ward level:

"I actually have responsibility for a ward where I have very little influence over what happens in the ward, how the ward grows and shrinks in size and what is brought in and not brought in, for example."

Thus, surgeons felt that they did not have the possibility to influence the administrative workings of the wards in which they worked. They also felt that even if they could change routines it was a hopeless task to get everyone to accept the changes. This situation made them feel "a bit powerless."

While there were differences between the two groups of physicians in terms of their perceived level of influence at the ward level, they were both in agreement that they had no power at the department, hospital and county council levels. The types of decisions that were made at these levels were primarily organizational, including planning, routines, personnel, purchasing or even decisions about merging two departments.

"Of course we have medical responsibility. But everything else, administration and personnel, that's not really our business."

"In general I feel that we have little influence on our work in relation to the amount of responsibility we have."

The overall feeling was that physicians had *responsibility* without *authority*.

Physicians' desires for influence

Surgeons were fairly united in their wish to have more influence in organizational decisions at the department, hospital and county council levels. The types of decisions they wished to influence ranged from purchasing surgical lamps to changes that would affect the whole workplace such as merging two departments. They particularly emphasized the need for more information from management about impending changes, as well as the desire to be asked for their opinions on such changes.

Physicians in the geriatrics department were not as categorical as the surgeons were in their desire for more influence. In principle they felt that such influence was a natural part of the physician's job description. However, in order to make such decisions they had certain conditions that needed to be met such as time and training. They felt that they had too little knowledge about administrative matters to feel secure in making such decisions. They also felt that it was difficult to make a decision about something of which one has no knowledge:

"There's a lot of talk of privatizing the hospital and such. I don't really know how it works. Then they ask, 'do you think we should this or that?' If I had the chance to really familiarize myself with the subject maybe I could say what I thought. Well, I don't really understand what they are talking about. That makes it hard to take a stand, and that means that one can't participate and influence since one doesn't know what it all means."

So both groups wished to have more influence but geriatrics physicians qualified this desire with the necessity of more time and knowledge.

Physicians' feelings of affiliation with the wards/clinics

Contrary to my observations, most of the physicians I interviewed felt a sense of belonging to the wards where they had the most contact. This was usually a positive feeling. Those who did not work with just one ward, primarily residents, did not feel as much affiliation with the wards. In addition, feelings of affiliation were a bit more complicated in the surgical department, where physicians have several workplaces (wards, consultations, surgery, etc.). Here, they did feel like consultants from an organizational perspective, which they experienced as wrong and negative:

"It should be the case that the doctor is a part of the ward, a part of everything, even personnel questions and everything. But we have been disconnected from all that and aren't a part of it any more, and I think that has worsened our work environment. One feels that one has essentially no connection to what passes for influence over one's work."

The doctors at both departments said that they rarely participated in work place meetings in the wards. Some said that they were not invited. Others said they were welcome but that they did not have time, or that they did not have the interest.

Physicians' views on QUL

As mentioned earlier, QUL is a tool used to evaluate the quality of care at a hospital. Both departments had earlier undergone QUL evaluations and thus there was reason to believe that the physicians would have opinions on the process.

In reality, only two out of the ten physicians interviewed knew what QUL was about, one from each department. These two individuals had opposite views about QUL. The surgeon felt that it was a positive tool, although he was negative about the possibilities of following up the evaluation because of the evaluating office having been closed down by the local politicians. The physician from geriatrics was more negative. She felt that QUL took too much time to implement in relation to what one got in return.

Physicians' views on "Quality—at your service!"

After the QUL evaluations, personnel were trained in a process-based improvement strategy called "Quality—at your service!" The strategy involved assembling multi-disciplinary teams

of personnel who would work on identifying and improving barriers to quality of care. Unlike the physicians in the geriatrics department who attended 16 hours of training in the method, the surgeons only received a half-day of training. This was apparently due to the lack of interest from surgeons.

In general, the surgeons were more negative towards the strategy than the physicians from geriatrics. They felt that they did not understand it, that the training went too quickly and that they did not see the relevance for their work. On the other hand, surgeons felt that the group work that resulted from the training was positive because they involved mixed personnel categories so that "all voices could be heard." One surgeon who had participated in such a team, was critical however of the lack of structure in the group. He felt that the problem had not been clearly defined beforehand, which made it difficult to evaluate the effects of the changes.

The physicians in the geriatrics department felt that there was nothing new about the strategy; they had heard it all before when quality circles were "in." However, they did think that the way of working in these teams was practical and relevant. They particularly felt that the method was beneficial for practical nurses since it gave them a way to participate in decision-making.

Physicians' initiation of quality improvement activities

The majority of the physicians interviewed felt that they lacked the time necessary to initiate quality improvement activities. They saw such activities as adding to their workload and stress. Their first priority had to be direct patient work. They felt that this situation was the result of the hospital being primarily interested in its financial workings. One possible solution to the problem was if the department could get DRG (Diagnostic-related groups) points for quality work.

In addition to the time aspect, the question of seniority came up. One resident felt that one had to be a senior physician in order to initiate quality work. Another resident felt that if one was not a senior physician, then one did not have to initiate "these kinds of projects."

Results in relation to the literature

The non-involvement of physicians in quality work is not an unknown phenomenon. The problem is discussed in literature from the United States (Blumenthal & Edwards, 1995; Shortell, 1995), the United Kingdom (Berwick *et al*, 1992; Sutherland & Dawson, 1998), Sweden (Aldstedt, 1998) and Finland (Kivimäki *et al*, 1999). In a U.S. survey of over 3,000 hospitals, Shortell (1995) found that only 14% of active staff physicians had been exposed to CQI/TQM training and that 10% had or were currently participating in a quality improvement project team. In the Finnish study (Kivimäki *et al*, 1999) the majority of surveyed physicians in a department that employed TQM stated that they were not willing to continue the TQM model and they would not recommend it to other hospitals. These authors, and others, have attempted to explain why physicians are not involved, why they should be involved, and how they can be encouraged to get involved in quality work. Below I discuss the results from the focus group discussions that I conducted in relation to this literature.

Improving the quality of patient care requires that employees change the way they do things. Resistance to change in organizations can be classified into three categories: the "don't need to change," the "can't change," and the "won't change" (Garside, 1998). The "don't need to change" blockage is characterized by an inability to see the need for change. The "can't change" blockage is often given for reasons of lack of resources or power. Finally, the "won't change" blockage implies a political resistance in which the costs of change are thought to outweigh possible benefits. This classification is useful for categorizing the reasons physicians' lack of involvement in quality improvement activities (table 6).

Table 6: Categorization of the proposed reasons why physicians are not involved in quality improvement.

Don't need to	**Can't**	**Won't**
Lack of relevance Lack of clinical data	Lack of time (Lack of authority)	Fear of malpractice No peer group support Suspicion of management Lack of commitment to organization Loss of autonomy

Some physicians have indicated that they do not see the relevance of quality improvement for their own practices (Aldstedt, 1998). This is reflected in the response of one interviewee in the Shortell study: "It's okay if the hospital wants to do it, but it doesn't affect me." The surgeons that I interviewed in the focus groups also said that they did not see the relevance of the quality training that they received. The reason for this ambivalence may be that most physicians do not recognize the important influence that the organization has on medical outcomes (Sutherland and Dawson, 1998). Thus, TQM, and other quality improvement schemes to improve the organization, are seen by physicians as "a foreign set of principles, and [they] view adherents as 'converts' to a quasi-religious managerial cult" (Blumenthal & Edwards, 1995, p.248). Another reason why physicians may feel ambivalence towards quality improvement is that quality problems are not presented with relevant clinical data supporting them (Shortell, 1995). This was echoed by one surgeon I interviewed who felt that the quality group he was involved with was unclear in its objectives, thus making it difficult to evaluate effects with any degree of certainty.

The belief that quality improvement activities do not have any relevance for physicians' clinical work is related to one of the "can't" reasons: lack of time (Berwick *et al*, 1992; Shortell, 1995). Physicians feel that their efforts should be concentrated on "direct patient work", and not on meetings that take time away from this work (Aldstedt, 1998; Ericsson, 2000). This feeling was echoed in the responses of the physicians that I interviewed. In fact, it was the primary reason that they themselves gave for why they do not initiate quality improvement activities.

The second reason in the "can't" column, lack of authority, is in parentheses because I have not found it cited in the literature but it came up in the focus groups that I conducted. It appeared from these interviewed that the physicians felt that they had *responsibility* without *authority*. This may be due to the way hospitals are structured in Sweden. Physicians are

directly accountable to the head of the department, and they work in tandem with the head nurses, who have ultimate administrative responsibility for the wards. Thus, although they have primary medical responsibility for patients, physicians often do not have the authority to regulate the routines and activities that surround the medical interventions. This feeling of a lack of authority is echoed in a study of the views of physicians on performance-based reimbursements in 11 Swedish county councils. "They paint a picture of being kept on the sidelines away from organisational influence and thereby having no ability to improve conditions" (Forsberg *et al*, manuscript, p. 21)

The majority of reasons cited in the literature for physician non-involvement in quality improvement seem to fall under the "won't" category. This means that even if physicians understand the need for quality improvement and feel that they could contribute to such work, they may choose not to for other reasons. One reason for physicians in the U.S. not wanting to contribute to quality work is a fear that it may result in clinical protocols which could be used against physicians in malpractice suits (Shortell, 1995). In addition, physicians may lack peer group support for involvement in such activities (Shortell, 1995). Thus, a physician who wishes to get involved may not because she senses that her colleagues would not accept it. This may be linked to the second reason in this category: suspicion of management's motives for promoting quality improvement work. Because TQM has often been used in a climate of downsizing and cost reduction, physicians have been skeptical of getting involved in such initiatives (Shortell, 1995; Aldstedt, 1998). Distrust of management may also be due to physicians' lack of commitment to the organizations in which they work. Sutherland and Dawson (1998) have proposed that physicians are less receptive to change that is initiated by managers because they feel more commitment to the medical profession than to the organizations in which they work.

Physicians' commitment to the medical profession is linked to the last reason in this list for why physicians may avoid getting involved in quality improvement: loss of professional autonomy (Berwick *et al*, 1992; Sutherland & Dawson, 1998). Professional autonomy has been identified as a significant predictor of job satisfaction in physicians (Stevens *et al*, 1992; Forsberg *et al*, manuscript). Professional autonomy for physicians is based on self-regulation and freedom from external control (Sutherland & Dawson, 1998). This "protectionism" is justified by 1) "tacit knowledge" within the profession that is not available to outsiders; 2) the belief that physicians can be trusted to act responsibly without supervision; and 3) the assertion that the profession can be trusted to regulate itself.

There is evidence that professional autonomy has decreased for physicians in the past decades in both the U.S. and Sweden (Bonn & Bonn, 2000; Forsberg *et al*, manuscript). This decrease in professional autonomy has been particularly pronounced in Sweden. The loss of professional autonomy for physicians in Sweden parallels their bureaucratization and came about in a gradual process during the post-world war II era (Heidenheimer, 1980). This process involved the Specialist Licensing Law of 1960, that took the power of bestowing specialist licenses from the profession and gave it to the State Board of Health. It also involved the dissatisfaction of younger physicians with the wage system in the mid-1960's that gave them the incentive to trade professional autonomy for economic gains. The final *coup de grace* for physician autonomy, however, was provided by the seven crowns reform of 1970. This law introduced a flat-fee for outpatient care, took away physicians' rights to conduct financial transactions, introduced a fee-for-service payment plan, equalized incomes within the profession and reduced working hours for physicians (Carder & Klingeberg, 1980).

Given the importance of professional autonomy for physician satisfaction, and given the losses that physicians have experienced in this area, particularly in Sweden, it is perhaps not surprising that a method that is associated with lowered autonomy would be rejected by physicians.

Discussion

The participation of physicians in improving quality of care is important for several reasons. First, the link between physician attitudes towards patients and patient satisfaction and outcomes seems to be too clear to ignore (Ottosson, 1999) The strength of this link implies that physicians are in a unique position to observe the effects of health care on patients, knowledge that is vital to quality improvement efforts. Second, physicians do not work in a vacuum. They are important components in a larger system (Berwick *et al*, 1992). As such, their participation in the improvement of health care is indispensable. Finally, involvement in quality improvement may be a way for physicians to regain power within the system, and thus increase professional fulfillment (Widerström, 2000). Thus, it seems expedient to encourage and motivate physicians to become involved in improving the quality of services.

The recommendations for getting physicians more involved in quality improvement activities that are presented here come primarily from Shortell's study of over 3,000 hospitals in the United States (1995). The main recommendations for increasing the relevance of QI for physicians are to focus on clinical applications, encourage physician leadership, and use "data, data and more data." Shortell found in his study that those sites that had focused their quality improvement efforts on clinical applications from the beginning had a greater degree of physician involvement than those that focused on other types of improvements. Thus both he and Blumenthal and Edwards (1995), recommend focusing on strategically important clinical issues to get physicians interested. These authors also recommend training a nucleus of physicians to lead teams, thus giving them a sense of ownership in QI activities. Finally, the authors feel that physicians will be more likely to participate in data-driven clinical studies than in organizational issues. However, Blumenthal and Edwards point to the danger of this leading to an institutionalization of a project-based approach, which may hinder cultural change in the organization.

In order to reduce time pressures on physicians, Shortell (1995) recommends using physicians as consultants to QI teams or to use them in the beginning of the process. Thus, they could be present in the problem-definition and solution-generating processes, but others would carry out the monitoring processes. Another suggestion is to connect performance appraisal and compensation to participation in QI efforts. In the Swedish context, this would also necessitate the introduction of DRG points for quality work, which do not presently exist.

Conclusion

In some senses my initial observations were confirmed, in others they were not. My initial impressions were that physicians were not involved in the non-medical workings of the department, and that they were not interested either. In the former observation I was somewhat correct. Physicians that had one ward with which they worked felt a sense of belonging there. However, this did not mean that they felt that they had influence over the workings of the ward. On the contrary, they felt left out of the decision-loop on many counts.

The second observation concerned physicians' current participation, and desires, to get involved in quality improvement efforts. It is not clear that QI in particular is interesting for them, but they are certainly interested in gaining more influence over non-medical decisions at all levels of the health care apparatus. Since involvement in decision-making by personnel from lower levels of the hospital hierarchy may be seen as a bid for power (Locke & Schweiger, 1979; Franssén, 1997), perhaps physicians could also be convinced to participate if the incentives were as great for them.

6.2 *Correlations between the work environment and the quality of care*

In paper VII we reported on the results of a controlled, prospective study of the effects of a quality improvement program on patient and personnel satisfaction. Personnel involvement in quality improvement was hypothesized to lead to an increase in satisfaction for both staff and patients in the intervention clinic. As the study was controlled, we analyzed the data primarily with the comparison between the two departments in mind. Thus, we tested differences between departments in employee perception of the work environment over time with tests of differences of means (Student's t-tests). In addition, we provided some cross-sectional results in order to see if there was a relationship between working on a quality team, or with other methods of quality improvement, and personnel's perception of the work environment and their own well-being. However, due to an absence of space, we did not report on the correlations between personnel evaluations of their work environment, well-being, and patient evaluations of the care they received in the hospital. In this section I present these correlations with a short explanation and discussion.

Pearson's product-moment correlations were conducted on a file with personnel and patient results from the time two measurement, merged on ward or clinic (n=336). Table 7 provides the correlations and significance levels. Here, we are primarily interested in the correlations between the first four variables (patient evaluations of care) and the rest of the variables (personnel evaluations of their work environment and well-being).

The results indicate significant correlations between personnel evaluations of their work environment in terms of leadership, efficiency, social climate and workload, and one or more aspects of patient-rated with care. All of the significant correlations are positive. Thus the higher the personnel's rating of their managers, the greater patients rated care processes ($r = 0.22$), personnel's work environment (0.37), staff attitudes (0.25), and overall care (0.21). In addition, staff perceptions of the level of efficiency at their workplaces were positively related to patient's perception of staff work environment (0.32). That is, the more staff felt that they worked in an efficient manner, the more patients felt that staff had a good work environment. Furthermore, patients' perceptions of staff attitudes were related to personnel's perception of the social climate at the workplace (0.23). Finally, personnel's perceptions of their workload were positively correlated with patients' rating of staff's work environment (0.3) and with the overall level of care they received (0.28).

Table 7: Pearson product-moment correlations between personnel and patient variables.

Correlations

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Patient-rated care processes	Pearson Correlation	1,000														
	N	231														
2. Patient-rated work environment	Pearson Correlation	,526*	1,000													
	N	132	156													
3. Patient-rated staff attitudes	Pearson Correlation	,718*	,501*	1,000												
	N	216	145	254												
4. Patient-rated overall quality grade	Pearson Correlation	,554*	,510*	,510*	1,000											
	N	218	153	235	270											
5. Mental energy	Pearson Correlation	-,069	-,216	-,102	-,051	1,000										
	N	89	58	92	91	141										
6. Work-related exhaustion	Pearson Correlation	-,142	-,019	,045	-,045	-,462*	1,000									
	N	91	60	95	93	138	143									
7. Work load	Pearson Correlation	,109	,297*	,142	,278*	,119	-,302*	1,000								
	N	94	61	97	97	139	141	148								
8. Goal quality	Pearson Correlation	,094	,269	,035	,149	,021	-,184*	,203*	1,000							
	N	80	49	85	82	126	127	129	131							
9. Efficiency	Pearson Correlation	,126	,324*	,159	,087	-,034	-,117	,143	,695*	1,000						
	N	91	59	94	93	137	138	140	131	142						
10. Social climate	Pearson Correlation	,185	,158	,232*	,038	,083	-,173*	-,055	,354*	,448*	1,000					
	N	91	59	94	94	139	140	143	129	140	145					
11. Leadership	Pearson Correlation	,219*	,372*	,247*	,206*	,047	-,121	,120	,600*	,627*	,563*	1,000				
	N	86	58	90	92	133	134	136	125	135	135	138				
12. Personal development	Pearson Correlation	-,021	,064	-,055	-,012	-,026	,010	,120	,352*	,484*	,430*	,465*	1,000			
	N	91	59	95	94	137	139	144	128	138	141	136	145			
13. Influence	Pearson Correlation	,035	,037	,082	,058	,167	-,200*	,194*	,460*	,592*	,404*	,577*	,543*	1,000		
	N	91	61	94	93	136	138	143	127	138	140	134	141	144		
14. Satisfaction with work	Pearson Correlation	,194	,141	,054	,159	,312*	-,382*	,038	,489*	,502*	,435*	,552*	,500*	,541*	1,000	
	N	95	61	98	98	139	141	146	131	141	143	137	144	142	148	
15. Satisfaction with care	Pearson Correlation	-,078	-,102	-,008	,004	,272*	-,275*	,153	,280*	,406*	,285*	,397*	,126	,273*	,342*	1,000
	N	94	61	97	97	132	132	136	123	134	134	129	133	132	137	138

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

On the whole, these results are intuitive and support the underlying assumption of this thesis. That is, the greater staff's rating of their work environment, the higher patients' evaluation of the quality of care they receive. However, one result of this analysis was particularly interesting; in those wards/clinics where staff perceived their workload to be high patients also rate quality of care higher. This is perhaps not too surprising since presumably staff were working hard to satisfy patients' needs! However, it also points to the potential conflict between personnel needs and patient needs that was mentioned earlier.

7. DISCUSSION

7.1 Primary findings

The aim of this thesis was to identify organizational attributes in the health care work environment that could have an impact on personnel well-being and the quality of care that they provide. In order to reach this aim, four processes were carried out: identifying important individual and organizational attributes, testing the strength of the measurement instrument and process, developing and testing a mediational model, and investigating the process and effects of a quality improvement initiative on personnel and patients. The main findings, and their relation to previous literature will be presented according to these four processes.

The importance of individual and organizational attributes

Both organizational and individual factors play an important role in health care personnel's perceptions of the work environment and in their self-rated health and feelings of professional fulfillment. Factors that increased the chance of experiencing higher professional fulfillment (job satisfaction) were experiencing high levels of goal quality, relations with manager, efficiency, personal development, autonomy, and work climate, as well as low levels of work exhaustion. These results are substantiated in the literature. In a study of 356 Swedish physicians, for example, Arnetz (1997) also found that skills development and work climate explained significant portions of work satisfaction. However, in their study of 254 personnel from 12 hospital wards, Kivimäki and Lindström (1995) did not find that higher goal and process clarity were predictors of job satisfaction. Finally, our findings that neither self-esteem nor workload predicted professional fulfillment can be found elsewhere in the literature (Shahani *et al*, 1990; Engels *et al*, 1998).

Factors in our study that predicted high work-related exhaustion were low feelings of professional fulfillment, high workload, low self-esteem, being a woman and low use of active coping. These results were not contrary to the literature either. Low job satisfaction has consistently been associated with exhaustion (Leary & Brown, 1995; Petterson *et al*, 1995; Leiter & Harvie, 1996). High self-esteem, by contrast, has been associated with less psychological distress (Zorilla *et al*, 1995), and with lower levels of burnout (Rosse *et al*, 1991). Finally, workload has been shown to lead to greater individual strain (French & Caplan, 1972; Deary *et al*, 1996).

Studies also indicate that English psychiatrists and psychiatric nurses experience their work environments more positively than their Swedish counterparts. However, English psychiatric nurses, but not psychiatrists, experience poorer mental health and more exhaustion than their Swedish counterparts, despite rating their organizations more positively. One explanation for this apparent anomaly may be the lower levels of self-esteem reported by the English nurses. Self-esteem has been found to be a moderator of the relationship between stressors and health and well-being (DeLongis *et al*, 1988; Pierce *et al*, 1993; Jex & Elacqua, 1999).

We also found differences on the basis of professional group and gender among Swedish health care personnel. In terms of differences between professional groups, psychiatrists experienced more discrimination, a greater workload, lower social climate, and more work-

related exhaustion than mental health nurses. However, psychiatrists also experienced greater possibilities for personal development than nurses did.

In addition, we found differences based on gender in Swedish health care personnel. Women reported lower levels of self-esteem, goal quality, personal development, and autonomy than men did. Furthermore, women experienced more work-related exhaustion than their male counterparts. Female doctors and managers have been reported as having a higher prevalence of minor psychiatric disorders than their male colleagues (Wall *et al*, 1997), and female human service workers have scored higher on emotional exhaustion than males (Maslach & Jackson, 1981). There were no differences between men and women in our study in terms of professional fulfillment. This deviates from other studies of health care personnel where women have expressed lower job satisfaction in relation to men (Heim, 1991; Kushnir *et al*, 1997). This could be because of the greater proportion of female physicians in our sample than one usually finds in studies of health care personnel. Finally, in a theoretical overview of the literature, Moore and Cooper (1996) conclude that the effect of gender on stress and burnout is not straightforward and may depend on the measures employed.

The measurement process: issues of validity and reliability

Two aspects of the measurement process were examined in this thesis: response bias and the validity and reliability of our measurement instrument. In my examination of non-response (paper IV) I found no evidence for bias in a postal study that had an original response rate of 51%. That is, responders to the postal survey did not differ from non-responders on either exposure or outcome variables. Furthermore, a re-calculation of the response rate, taking into account individuals who should not have received surveys, indicated an actual response rate of 56%. This indicated that 5% of the lower response rate was due to poor personnel records.

Since it is rare that work environment studies report on non-response studies (if indeed they are carried out), it is difficult to compare these results with the literature. However, Arnetz (1996) found no evidence to suggest response bias in a loss-to-follow-up study involving both survey and physiological data. Since his survey variables were similar to ours (work-related exhaustion, for example), we can see this as a further validation of our results. It would be misleading, however, to suggest that my study provides evidence that response bias in survey studies is exaggerated. Indeed, many studies outside the field of occupational health have found differences between responders and non-responders (Clark *et al*, 1983; Hill *et al*, 1997; van den Akker *et al*, 1998). My study merely suggests that low response rates are not necessarily synonymous with response bias.

The second aspect of the measurement process that was examined here was the validity and reliability of the items in some of the key scales that were employed in the three studies: mental energy, self-esteem, professional fulfillment, work-related exhaustion, work load, relations with manager, and efficiency. We had originally examined these scales with Cronbach's alpha statistics (a measure of internal consistency reliability) and found Cronbach's alphas of between 0.70 and 0.85 (with the exception of participation). Self-esteem had a reliability of over 0.80. Exploratory factor analyses revealed that the scales were all uni-dimensional, and had individual factor loadings of at least 0.60.

Despite the acceptable results in the exploratory factor analyses, however, the confirmatory factor analyses indicated that the scales needed more work. In all but one scale, it was

necessary to remove an item. Furthermore, two of the scales were not found to be uni-dimensional. Instead, professional fulfillment was found to be comprised of a satisfaction with work component and a satisfaction with care aspect. Self-esteem was found to be composed of four dimensions, two positive and two negative.

Because most of the scales had not been tested before in their present form, it is not possible to compare these results to the literature. However, the dimensionality of the self-esteem scale (Rosenberg, 1965) has been identified as problematic by other authors (Kaplan & Pokorny, 1969; Hensley & Roberts, 1976; Carmines & Zeller, 1979; Goldsmith, 1986; Shahani *et al*, 1990). Only one study that we are aware of found a unidimensional model of Rosenberg's self-esteem scale using confirmatory factor analysis (Shevlin *et al*, 1995). However, this finding may have been due to the small differences in age and background in the sample, which consisted of 202 psychology undergraduates (Goldsmith, 1986). The other studies, two of which used confirmatory factor methods, found two-dimensional scales. Our attempts to replicate their models did not succeed. Thus, our results are more critical of the Rosenberg self-esteem scale than those previously reported.

A model of mediation

Building on the results of the confirmatory factor analyses we conducted, we then tested a mediational model of organizational and individual well-being, where job satisfaction was the mediator. Organizational well-being was represented by the following latent variables: relationship with manager, efficiency, and autonomy. Individual well-being was represented by mental energy and work-related exhaustion. Satisfaction with work was found to be a mediator of the relationship between organizational and individual well-being (figure 5). That is, there were no direct effects of organizational well-being on individual well-being, only indirect effects. Satisfaction with the quality of care one provides was not a mediator of the relationship between individual and organizational well-being. However, it did partly mediate the relationship between organizational well-being and satisfaction with work.

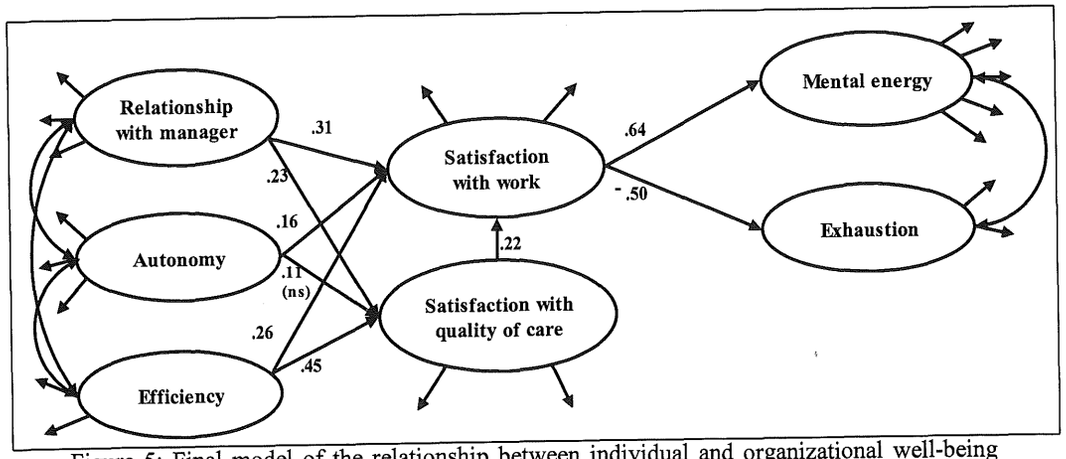

Figure 5: Final model of the relationship between individual and organizational well-being (χ^2=212.57; df=139; *P*=.00; RMSEA=0.03).

The link between autonomy, management relations and efficiency with job satisfaction is not new (Everly *et al*, 1976; Hackman & Oldham, 1976; Shoham-Yakubovich *et al*, 1989; Irvine & Evans, 1995). The same is true of the relationship between job satisfaction and well-being (Leiter & Harvie, 1996; Ramirez *et al*, 1996; Schaufeli & Enzman, 1998). However, there is less evidence for the mediational role of job satisfaction. Rather, most studies that we found treat the two outcomes job satisfaction and mental health on an equal level (Wall *et al*, 1978; Byosiere, 1987; Robertson *et al*, 1990; Moyle, 1998). In their test of the relationships between perceived stress, satisfaction, and psychological well-being, Tetrick & LaRocco (1987) found evidence for a direct relationship between satisfaction and psychological well-being. Job satisfaction, in turn, was found to have a direct relationship with control. However, they did not test the full model together. Hackman and Oldham (1976) hypothesized that "critical psychological states" mediated the relationship between job dimensions and personal outcomes (such as job satisfaction). Wall *et al* (1978) attempted to replicate Hackman and Oldhams's model of job motivation with path analysis but also included mental health as an outcome. They found that there seemed to be more evidence that mental health was caused by job satisfaction rather than the "critical psychological states." However, they did not test the full model either. Thus, our results seem to be the first that test the full mediational model at once.

The impact of quality improvement on the health care environment

The fourth and final process in achieving the aim of this thesis involved testing the effects of a TQM-inspired intervention on patient and personnel satisfaction and well-being in a controlled, prospective study. We hypothesized that personnel satisfaction would improve through increased participation in decision-making, and that patient satisfaction would improve both indirectly, through increased personnel well-being, and directly, through actual improvements in the care environment. However, we did not find evidence to support these hypotheses. Instead, we found that only in the control group did social climate improve and work-related exhaustion decrease. Furthermore, those who actually participated in the intervention as planned experienced more work-related exhaustion and lower mental energy at the end of the study than those who did not. Finally, the QI intervention had no effects on patient-evaluated care, but was related to personnel perceptions of leadership, efficiency, social climate and work load. The fact that few people actually participated in the intervention may have played a role in the lack of effects that it had.

Participative decision-making has been found to have an impact on personnel's evaluation of work characteristics (Jackson, 1983; Weir *et al*, 1997), and on work satisfaction (Schaubroeck & Jennings, 1991) in controlled, prospective studies. The fact that we did not find this to be true could be due to the relatively low level of involvement in decision-making of most of the employees in the intervention department. However, even given this low degree of involvement, the results concerning those who did participate indicate that participation seemed to have a negative effect on them. Involvement in quality activities such as TQM (Kivimäki *et al*, 1997) and quality circles (Buch, 1992) has also been studied prospectively in relation to health care workers. TQM was found not to influence work-related perceptions (including satisfaction), whereas involvement in quality circles was found have an effect on the work environment. It should be mentioned, however, that none of the above studies measured employee health as an output and only one measured patient satisfaction (Weir *et al*, 1997). Thus, our results are, to our knowledge, the first of their kind.

Finally, focus group discussions with physicians indicated that physicians felt they have responsibility without authority. The physicians we interviewed also wanted more influence in decision-making at all levels of the health care apparatus. However, they felt that they were limited because of time. These results have been confirmed elsewhere (Berwick *et al*, 1992; Shortell, 1995; Aldstedt, 1998; Ericssson, 2000; Forsberg *et al*, manuscript).

7.2 Methodological considerations

There are several methodological considerations that should be taken into account when interpreting the results of this thesis. I have already taken up the issue of non-response and measurement error. Below, I will discuss the potential problems of self-report data and the methodological implications of cross-sectional designs.

Self-report data

The data in this thesis are derived primarily from self-administered questionnaires. Thus, we have relied substantially on subjective reports of individuals' work environment, satisfaction and individual well-being. There has been considerable discussion in the literature about the relationship between the environment, the individual's perception of the environment, and outcome, noting that the connections among these could be over-inflated due to problems with self-report data (Spector, 1992). In a review of the literature, Spector summarized the possible explanations for this into five categories: social cues (norms in one's working environment), personality (locus of control), cognitive processes (changing responses on the basis of cues about performance), mood, and attitudes about one's job. One strong piece of evidence supporting this hypothesis is that it seems that people who like their jobs tend to rate their organization's characteristics higher. This could mean that our estimates of correlations between organizational well-being and job satisfaction could be exaggerated. In addition, studies with multiple data sets have indicated that correlations were due to common method variance, a result of the individual answering questions on his environment, attitudes and health at the same time. However, most of the studies of these different explanations were conducted in the lab and have not been replicated in the field. Spector concluded that there was "surprisingly little evidence that observed relations are attributable to the self-report method" (1992; p. 143).

Lazarus (1990a) took a different approach to the attacks on subjective data. First, he cited evidence that subjective appraisals are better predictors of emotional reactions than objective measures. Furthermore, he suggested that it was unrealistic to assume the possibility of measuring the true objective situation. For example, even a physician's diagnosis, often regarded as an "objective" measure of health, relies on the individual's subjective description of his symptoms. Finally, Lazarus proposed that if stress is based on appraisal, which is his contention, then subjectivity is more desirable than objectivity: "Stress and emotion, too, depend much more on the inferential meanings about what happens than on what actually happens" (p. 8).

I agree with Lazarus that the measurement of stress is meaningless without the individual's appraisal. However, I can also report that many of our measures have been shown to have high correlations with physiological measures of stress (Wiholm & Arnetz, 1997).

Negative affectivity

One of the major objections to self-report data is based on the concept of negative affectivity. Negative affectivity, a symptom of neuroticism, is characterized by aversive mood states, such as anger, disgust and guilt, and by behaviors such as introspectiveness and a tendency to focus on the negative side of things (Watson & Pennebaker, 1989). It has been proposed that negative affectivity distorts individual subjective ratings of their "true physical health." However, the evidence to support this suggestion is mixed. Watson and Pennebaker (1989) found considerable evidence to suggest that negative affectivity is a significant problem when psychological distress is used to predict general health in studies (which we have not done here). They also state that the same may be true of using daily hassles to predict health complaints.

In terms of the stressor-strain relationship, Jex and Spector (1996) found that although ratings of autonomy and job conflicts were significantly correlated with negative affectivity, zero-order correlations between stressors and strains were not affected when they controlled for negative affectivity. Thus, they concluded that the evidence that negative affectivity is problematic in the stressor-strain relationship was not strong. On the other hand, Spector *et al*, (1999) found that negative affectivity was significantly correlated with job satisfaction, although it may be that job satisfaction is predicted by negative affectivity. Lazarus (1990b) suggested that negative affectivity should be seen as an appraisal or coping style that could affect outcomes in the individual. Clearly, the jury is still out on the influence of negative affectivity in stress research.

Design issues

The second methodological issue to consider when interpreting the results of this thesis is design. The data in two of the three studies included here are based on cross-sectional studies. This means that data on exposure and outcome are obtained at the same time point, resulting in a snapshot of reality, making it impossible to draw causal inferences (Pedhazur & Schmelkin, 1991; Zahner *et al*, 1995). Thus, it is important to remember that the results of the first two studies do not imply any causality between job stressors and outcomes. It could be the case that job satisfaction is a predictor of perceptions of the work environment, or that mental energy is a predictor of job satisfaction. On the other hand, more stringent tests of the relationships between these variables in paper 6 indicated no such reciprocal relationship.

8. CONCLUSION

8.1 Implications

This thesis has several implications for working life, quality of care, and for research in this area.

1. Organizational aspects of the work environment, such as leadership, efficiency and autonomy are directly linked to satisfaction and indirectly linked to individual well-being. Thus, organizations that wish to increase satisfaction and decrease employee morbidity should not ignore these aspects.

2. The individual's own "psychobiological program" may explain why individuals who are exposed to the same stressors react differently to them. Thus, one cannot ignore the effects of personality, such as high or low levels of self-esteem, on individuals' perceptions of their work environment and of their own health.

3. Low levels of response to a questionnaire do not necessarily imply selection bias. If one is interested in external validity, however, it is probably expedient to conduct a non-response study to verify that selection bias was not present.

4. Confirmatory methods of factor analysis make a significant contribution to the refinement of measurement instruments.

5. Participating in quality improvement efforts may not contribute to improved satisfaction and well-being among personnel.

6. Providing incentives, and opportunities, for physicians to participate in improvement efforts may prove to be beneficial for health care organizations and for physicians themselves.

7. For the most part, patient satisfaction is related to a positive work environment for health care personnel. This implies that patient satisfaction cannot occur without personnel satisfaction. However, patients' demands may also contribute to a more hectic, and unsure, environment for personnel. This suggests that there may be an inherent conflict between patient and personnel needs.

8. QI/ TQM initiatives do not necessarily result in improved patient-related quality of care.

8.2 Proposal of a model and future research needs

This thesis was based on two models: a transactional model of stress and a model of the interaction between patient and personnel well-being. Figure 6 is a model that summarizes both what we have found in these three studies (straight lines), and what has been found elsewhere in the literature (dashed lines). To summarize, the role of job satisfaction as a mediator of the relationship between organizational and individual well-being has been illuminated in this thesis, as well as the role of health care personnel's own perception of the quality of services that they provide. In addition, we have expanded this model to include the

ultimate beneficiaries of health care personnel's work: the patient. We have motivated this by the fact that health care personnel are in the position to affect the public health of communities through their daily actions. We were not able to establish a causal link between personnel and patient satisfaction. However, I feel that Jones *et al*'s (1988) prospective, controlled study of the effects of a stress-management program on the rate of malpractice suits provides evidence that this relationship does exist.

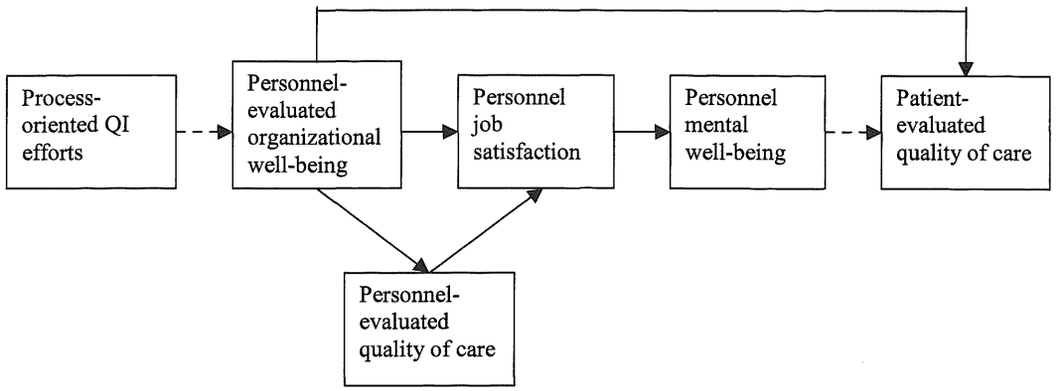

Figure 6: A model for future research on the relationship between personnel and patient well-being.

Similarly, we were unable to confirm the relationship between quality improvement efforts and personnel's evaluations of their work environment. However, this has also been demonstrated elsewhere in a controlled, prospective study (Buch, 1992). In study 3 we found evidence that involvement in quality improvement teams was correlated with lowered well-being (more exhaustion) among health care workers. However, these results were based on cross-sectional data (only the post-test) and thus need to be confirmed in a longitudinal study. Finally, we also found correlational evidence of a relationship between personnel's evaluation of their work environment and patient's evaluation of quality of care. These results have been found elsewhere in prospective, but not controlled, studies (Weisman & Nathanson, 1985; Arnetz & Arnetz, in press).

The model in figure 6 does not include feedback mechanisms and moderators. This is not because I feel that they are not important. On the contrary, moderators such as social support, coping and personality aspects have been shown to add to explained variance in the stressor-strain model (La Rocco *et al*, 1980; DeLongis *et al*, 1988). In addition, there is some evidence for reciprocity in this model (James & Tetrick, 1986; Greenberger *et al*, 1989). Thus, these aspects cannot be ignored. However, I believe that one has to start with a simple model and verify it before adding to its complexity.

The results of this thesis have taken us one step further in understanding the complicated relationship between personnel satisfaction and well-being on the one hand, and patient-evaluated quality of care on the other. Study 3 is the first study that we know of that combines these perspectives in a prospective, controlled design. Further, our use of structural equation modeling to identify the mediating role of job satisfaction in the stressor-strain relationship is

also novel to our knowledge. The implications of these results are important for all types of employees, not only health care personnel. However, more stringent research is still needed in this important area. The model presented in figure 6 could be a starting point for such research. Another area of research that needs to be explored, particularly in Sweden, is the effect that physician autonomy and influence has on their involvement in quality improvement activities. Finally, given the low amounts of extra reserves that health care personnel have today, the efficacy and efficiency of QI/TQM initiatives for both patients and personnel need to be examined more scientifically. Such research will strengthen our understanding of the relationship between stress, satisfaction, and quality of care.

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