Shock of practice or magic of medicine

Pressures and counter pressures experienced by clerks during the preclinical to clinical transition

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Preface

Deze thesis vormt de afsluiting van de Master Human Resource management. Dit kwalitatief uitgevoerde onderzoek richt zich op de overgang van de student geneeskunde van het leergedeelte naar de praktijk, het lopen van coschappen. Het gaat hierbij om waar de student nu daadwerkelijk tegenaan loopt als hij of zij voor het eerst op de werkvloer komt. Deze vraag werd geponeerd door dr. G. Koppelman, die zich in zijn tijd als student afvroeg waar studenten nu daadwerkelijk tegenaan lopen bij de overgang van preklinisch naar klinisch onderwijs. Dr. Koppelman wil ik dan ook bedanken voor het creëren van een interessante en intrigerende onderzoeksvraag. Verder wil ik mijn begeleider vanuit het UMCG bedanken, voor het meedenken, het sparren, hulp in het doen van kwalitatief onderzoek en de vele andere praktische en nuttige tips die hij me heeft gegeven. Natuurlijk wil ik graag mijn begeleider vanuit de Rijksuniversiteit Groningen, dr. P.H. van der Meer bedanken voor zijn commentaren en het beoordelen van de scriptie. Tevens wil ik de coassistenten bedanken die hun tijd hebben vrijgemaakt om te praten over hun ervaringen. Tenslotte wil ik graag mijn medestudenten bij het UMCG ontwikkelplatform, mijn vrienden en vriendin bedanken voor het luisteren en meedenken gedurende mijn scriptieperiode en natuurlijk mijn familie, niet alleen gedurende de afstudeerperiode maar tijdens de gehele studie.

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Abstract

The transition from preclinical to clinical training is the most stressful period of clerkship. Discussing the aspect of stress, stress models and ultimately using the Job Demands and Resources model, this research identifies the different sources of stress a clerk faces and the factors that counterbalance these aspects during the transition period. Through usage of seven semi-structured interviews five main themes of demands were found to be important: pressure of work, taking on the professional role, pressure of (non) guidance, personal pressures and general pressures. The resources that help the clerk to counterbalance the sources of strain are depicted in five main themes: social support, clinical training, personal development, personal characteristics and general resources. While the feeling of not making a contribution to patient care and the lack of medical factual knowledge, skills and guidance causes the clerk to face strong feelings of stress, the intrinsic motivation of completing clerkships and ultimately become a competent future doctor is a strong resource to withstand the demands during transition. Hence, further results are discussed and recommendations for further research are given.

1 Introduction

The study on which this thesis is based is concerned with the perceived stress felt by medical students at the very beginning of their clinical training. Research regarding stress in medicine has been done under medical students (Firth, 1986; Moss & McManus, 1992; Helmers et al., 1997) but also under medical residents (Prins et al., 2007; Eckleberry-Hunt, et al., 2009), who are further in their education towards becoming a skilled professional. Both groups have in their training a shared similarity, medical students and residents both experience stress when making the shift from preclinical to clinical training (Shapiro et al., 2000). Though this article is concerned with medical students, the work of Prins regarding residents is exemplary of how stressful medical practice can be. In her recent research (2007) concerning burn-out among medical residents Prins et al. found that 13% of the Dutch medical residents working in a university medical centre met the criteria for burnout. Of the residents fulfilling the criteria for burnout were 29% in their first year of residency. Support for this outcome is found in research of Martini et al. (2004). Martini states that medical residents in their first year of residency had significantly higher rates of signs of burnout than those further in their education.
Burnout has been defined as a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach et al.. Al., 1996). Emotional exhaustion refers to feelings of being overextended and depleted of one's emotional resources. Depersonalization is characterized by a negative, cynical, and detached response to other people including colleagues and patients. Reduced personal accomplishment is a decline in feeling competent in performing tasks and accepting responsibility (Maslach et al., 1996).
For this 29% of residents it is a serious problem and although this high percentage is alarming, the expected consequence and outcome of "being sick at home" is not the case (van der Heijden, 2006). An explanation can be found in the work of Bakker et al. (2001). His work says that emotional exhaustion is defined as a consequence of intensive physical, affective and cognitive strain as a *long term consequence* of prolonged exposure to certain demands. In other words; before having an actual burnout one must be exposed to high job demands or so called stressors over a longer period of time.
This could be an explanation why research on residents in their beginning of residency report high rates of signs of burnout but do not (yet) experience the negative outcomes. Though this does not lead to burnout it has not only negative effects for the individual resident, but also for patient care (Shanafelt et al., 2002). An explanation is that residents leave the medical education because of high stress levels or did not participate in the survey because they were indeed sick at home. The indication of stress in such a survey will be automatically lower.
Although the time variable explanation is righteous of mind, the research outcomes and percentages stay alarming. A conclusion that one can draw from the research of Prins is that in the very beginning of residency the residents experience an extreme form of stress.
The same situation is seen in earlier medical education when a medical student makes the shift from preclinical to clinical training. The transition, from book based learning towards a real life context later on, is seen as one of the most stressful experiences in medical science (Alexander & Haldane, 1979; Sarikaya, Civaner & Kalaca, 2006). Van Hell says that the transition is often seen as "the shock of practice". Students and residents see their roles change from one of being taught to one of providing patient care (van Hell, 2008).
The students who are at the beginning of their clinical training are afraid of making mistakes, and they do not want to look awkward to the patients and senior doctors (Radcliffe & Lester, 2003). The stress felt by students can be identified as a new experience of dealing with patients and their suffering and death, dealing with too much or too little responsibility, the long working hours and the high

work pressure (Godefrooij et al. 2010; Karg, 2003., Moss & McManus, 1992). Furthermore, students identified their struggles with the transition as feeling overwhelmed and feeling frustrated (O'Brien et al. 2010).

It is this stress at the very beginning of the clinical training period that deserves a closer look. Research has been done under medical students and their feelings of stress during clinical training (Sarikaya et al.; 2006., Linn & Zeppa; 1984., Toews; 1997). And although Linn and Zeppa found that for students in the first quarter of the year (without prior clinical experience) the stress levels reported were significantly higher than those in the other quarters of the year, their research does not give an explanation for this outcome.

Furthermore, the stress perceived by newcomers in medical practice did receive relatively little attention. The broader view of seeing the clerk as a newcomer on the job gives more theoretical rationale although the focus in literature remains on employees who are employed over a certain period of time. Further research has to be done for newcomers in clinical medical science.

This study aims to investigate the stress felt by medical students at the very beginning of their clinical training. Dr. G. Koppelman, a children's pulmonologist, signaled some years ago when he himself made the switch from books to practice that he and many of his co-students had a difficult time during the first period of clerkship. He then asked himself the question what do students really experience when the make their very first entry in clinical practice. Interviewing multiple, just started, clerks the central theme is discussed.

The main research question is: *what factors cause the stress felt by students at the head start of clinical practice and which factors counterbalance this stress*.

The theoretical rationale for constructing a new conceptual framework is missing. Hence in order to find a coherent answer of the research question a new conceptual framework has to be constructed. For creating the framework the model of the Job Demand Resources (Bakker et al., 2001) will be used. Although the main focus of this model is concerned with long term consequences of stress outcomes, it is very useful as a guide in gaining knowledge about the stressors and counter pressures that are important at the head start of clinical training and for developing a more detailed conceptual model.

2 Theory

2.1 Introduction

Medical school is often seen as a highly stressful environment (Bloom; 1971). In fact, McGuire (1966) has described the characteristic state of the individual medical student as one of anxiety. High levels of perceived stress are found significantly more often among medical students during clinical training than in the general population as a whole (Helmers et. al.; 1997). Especially the transition period, from preclinical to clinical training, is a difficult period for medical students. During this period students experience high workload and feelings of stress. In Dutch clinical training during clerkships students have the opportunity to apply, and more importantly, to develop necessary competencies in an authentic clinical environment (Hell et al.; 2008). For developing competencies a stress-free medical school environment is not even desirable; some stress is needed for learning (Funkenstein; 1968). Although some stress can enhance learning, the perceived stress and anxiety felt during the transition can, as a consequence, cause cognitive overload which may be hampering student learning, decision-making and caring capabilities (Shapiro et al. 2000, Hell et al. 2008). Hence, Boshuizen (1996, in Godefrooij, 2010) acknowledged that the transition, when first entering the clinical workplace, is marked by a temporary decrease in student's ability to properly use their medical knowledge in clinical reasoning. Before identifying what factors cause these feelings of stress and anxiety in medical students, the focus will be on discussing stress and its outcomes and which models can be used to best identify the feelings of anxiety within clerks.

2.2 Stress

The concept of stress is one that is widely used by both scientist and the general public when discussing the interaction of a person with the environment. Physiologist Claude Bernard was in 1867 (Maslach, 1986) the first who came with the idea that external environmental changes can disrupt the internal stability of the person. Some decades later in 1935, Walter Cannon, an American physiologist, introduced the term homeostasis in which he refers to the internal state of balance and stress, where he refers to reactions that produced a collapse of the homeostatic mechanisms (Maslach, 1986).
Despite the earlier work of Bernard and Cannon, it was Canadian Hans Selye who most profoundly shaped the modern concept of stress. Selye discovered how multiple stimuli (heat, cold, x-rays and exercise) did cause tissue damage and was thus a nonspecific response to harmful stimuli. He proposed that stress is a nonspecific response to any demand made upon the organism. These demands are considered to be stressors. Selye conceptualized the non specific stress response as a three-phase General Adaptation Syndrome (GAS). The first, or alarm phase causes the body to react when a stressor is encountered. Bodily changes are increase in adrenalin, increase in heart rate and blood pressure, decrease in digestive processes, and a heightening of all senses. The second phase, resistance, occurs when the stressor is dealt with. The alarm response disappears, and the physiological changes that then occur are an adaptive reaction strategy. The third or exhaustion phase happens when the adaptive energy for resisting the stressor is used up (Maslach, 1986). Although highly influential in the concept of stress, a limitation of Selye's approach of explaining stress is that the focus lies primarily on physical stressors and physiological stress responses. Current literature (Lazarus & Folkman, 1984; McGrath, 1976; Bakker, Demerouti et. al, 2001) focuses

much more on psychological stressors and on psychological and social responses to those stimuli. Davidyan (2007) differentiates stressors over time. First he divides the stress concept in a stimuli and stress response. In which the stress stimuli is seen as a factor that causes stress, the stressors. And that the stress response indicates the outcomes stress has on a person. Furthermore he argues that acute stressors affect a person in the short term whereas chronic stressors have effect over the longer term which can lead to burn-out.

2.3 Definitions of stress

Stress as a term is widely used by professionals and the general public, although its meaning is not always clear. Definitions of stress fall apart in a three way. Stress can be seen as a stimulus, stress as a response or stress is seen as a stimulus-response interaction.
In the stimulus definition, stress is considered to be a characteristic of the environment that is disturbing or disruptive for a person. In this situation stress is seen as an external force that causes a strain response within the individual. This definition of strain is analogous to an engineering definition of stress, in which stress is load, or demand, placed on physical material (such as a metal beam) and strain is the resultant deformation of that material. If the strain falls within the elastic limits of the material, the material will return to its original condition when the stress is removed. Similarly, if the strain falls within the coping limits of the individual, that person will return to normal and not be permanently affected when the stress is removed. Although this stimulus definition approaches the most original concepts of stress it has been criticized for its inability to explain individual differences in response in to the same level of stress. Furthermore, from the stimulus definition one could draw the conclusion that an undemanding or even a boring environment is ideal because it is stress free (Cox, 1978).
The opposite of the stimulus definition is the response definition. Here stress is seen as a pattern of physiological or psychological reactions displayed by a person who is under pressure from a disturbing or dysfunctional environment. Here stress is seen as an internal response to external stressors. In this definition one can see the influence of Selye who argues that stress is a nonspecific response to a certain demand placed on a person. This definition has become less popular due to the fact that this definition implicates that stress response is fixed and unchanging. More recent research (Bakker & Demerouti et. al, 2001) shows that the stress response is one with much more variety. The third approach to conceptualizing stress has been to combine the stimulus and the response approaches and define stress as the consequence of the interaction between environmental stimuli and individual responses. This approach does not only focus on the continuing relationship between the individual and the surroundings, it also emphasizes the importance of psychological processes, such as perception and cognitive appraisal. Stress is considered to occur only when the person perceives an external demand as exceeding his or her capability to deal with it. Therefore, the individual's personal evaluation of the nature of the demand, of the available resources and personal skills, and of the presumed outcomes will determine the stress experience (Maslach; 1982). Opposite towards the stimulus and the response definitions, this continuing approach recognizes and deals with individual differences.

2.4 Stress outcomes

Learning for a clerk towards becoming a professional paediatrician is a demanding period and the consequences of working or learning in a demanding environment can be significant. Maslach (1986) argues in her dissertation that three distinct responses can occur; physiological, psychological-cognitive and psychological-emotional. When the stress response, as mentioned earlier in the General Adaptation Syndrome, is not adequately adapted it can result in physiological outcomes such as high blood pressure, ulcers, headaches, skin problems and the

increased risk of coronary heart disease (Maslach; 1986). Furthermore, excessive levels of stress have psychological outcomes. At the psychological-cognitive level, there is a narrowing of attention focus and a greater reliance on stereotyped and rigid thinking. This process interferes with memory, problem solving, and decision making (Janis, 1982). Employees who are highly stressed tend to have a more negative outlook on various aspects of the job and may feel underappreciated, feel a lack of control, and also feel their work is interfering with their personal lives (George et. al. 2005). The major reactions at the psychological-emotional level are frustration, anger, irritability, anxiety and depression. For a worker who experiences stress it may be difficult for them to be as caring and understanding with others (co-workers, patients, superiors) as they normally would be (George et. al. 2005). Maslach (1986) argues that these feelings may get expressed in a number of dysfunctional behaviours, such as excessive use of drugs and alcohol, eating disorders, aggression and even suicide.
Experiencing high levels of stress day in day out for an extended period of time can cause burnout. Burnout is especially likely to occur when employees are responsible for helping, protecting, or taking care of other people (Maslach, 1982). Three key signs of burnout are feelings of low personal accomplishment, emotional exhaustion and depersonalization. Reduced personal accomplishment results in feelings of not helping others as much as one should be and a decline in accepting responsibility (Maslach et. al. 1996). Emotional exhaustion refers to the feeling of being worn out by the constant stress of helping people who are sometimes in desperate need of assistance. Depersonalization is seen as being cynical and having a negative attitude towards co-workers and patients. A burned-out employee can depersonalize the person they need to help as seeing the patient like a case number and treating the patient in a cold and distant manner (George et. al. 2005).
The impact of experienced stress is perceived to affect not only the individual. From the medical workplace point of view colleagues also suffer from the stressed individual. Stress affects the health of all the staff. There is one less person to do the tasks and handle patient care. As Tyssen et. al. (2000) and Clegg (2001) recognizes that the remaining personnel have to do the same amount of work with fewer colleagues, thus increasing their workload and facing the strain of manpower shortages.
Long term consequences of stress leading to burnout can negatively impact, not only the stressed individual and its direct environment, but also the organization as a whole. Evidence has been found that burnout can lead to a decline in organizational commitment, long term absenteeism, intention to quit and actual turnover (Acker, 2008; Maslach & Leiter, 2008; Jourdain & Chênevert, 2010).

2.5 Definition used in this research

The definition which is used in this research is a combination of the stimulus and response approach in which stress is defined in terms of a disruption of the equilibrium of the cognitive-emotional-environmental system by internal or external factors (Lazarus & Folkman, 1984; McGrath, 1976). Stress can come from any situation that makes one feel frustrated, nervous or anxious and is caused by an existing stress-causing factor that Davidyan (2007) called stressor. These factors, stressors, may also lead to an equilibrium of the cognitive and environmental system or a state of well-being, depending on the performance capacities, for example, the available coping resources within the individual at a given time (Bakker, Demerouti et. al, 2001). The term stressor is thus used when an internal or external factor has the potential to exert a negative influence on most people in most situations.

2.6 Stress models

As there are many definitions of stress, the explanation of the stress concept has resulted in a wide variety of stress models. An overview of different models in time is given,

ending with the conceptual model that is used in this research.

One of the first models of stress was discovered in 1908 when Yerkes and Dodson argued that there is an inverted U relationship between stress and performance. In which an increased level of arousal leads to better performance. Until the trade off, afterwards the arousal will be negative because it impairs performance. Although the Yerkes and Dodson were pioneers on forming the concept of stress, the model is not widely used and accepted due to its conceptual vagueness and its poor scientific standards (Teigen, 1994). The previously discussed general adaptation syndrome model from Selye in 1936 has been highly criticized and was followed by other theoretical stress models. Critique on Seyle thoughts focussed on the idea that the reactions of humans to stress are so uniform it can be challenged by a wealth of data (Lazarus & Folkman, 1984). Furthermore, how people respond to challenges from their environment can be seen as a function of their personality, perceptions and the context in which the stressor occurs (Meichenbauw, 1977 in Hobfoll, 1989).

In response further stress models did focus on multiple aspects of stress. One of these aspects did focus on the relationship and consequences from occupational stress. Role stress theory (Kahn et. al. 1964) argues that organizational factors generate role expectations among role senders, who then transmit these expectations as role pressures to the focal person. These pressures interact with the personality of the focal person and with the interpersonal factors, yielding experienced pressure (e.g. role ambiguity, role conflict). Experienced pressure creates symptoms of ill health (Edwards, 1992).

Beehr and Newman (1978) discussed in their review of job stress literature a general model. Through their use of facet analysis Beehr and Newman were able to determine four major facets of work stressors; job demands and task characteristics, role demand or expectations, organizational characteristics, and organizational external demand. In the same period Cooper and Marshall came with their occupational sources of stress model. In which they found six major items including intrinsic factors on the job, role in the organization, organizational structure, career development, climate, relationships at work and extra-organizational sources of stress. Which in turn were related to personality and could result in outcomes as coronary heart disease or mental ill health (Cooper & Marshall, 1976)

House (1981) proposes in his Michigan model of work stress the mechanisms by which individual difference variables and perceptions of the work setting may have an impact on affective, cognitive, behavioral and psychological outcomes (House, 1981; Israel, Schurman, Hugentobler & House, 1992). This model was developed to provide a comprehensive approach to understanding and preventing occupational health problems and explores the relationship between occupational stress, social support and health (Israel et. al., 1992).

In addition to the occupational sources of stress model, more theoretical concepts were proposed to asses adverse health effects of stressful experiences at work. The person-environment (P-E) fit theory is one of those models and has as core premise that stress arises not from the person or environment separately, but rather by their fit or congruence with one another (French, Caplan & Harrison, 1982; in Edwards et. al. 1998). The theory assumes a curvilinear relationship between the level of psychological strain and a ratio demand/ability experienced by the individual (Edwards, 1996).

Another influential model used in research on the relationship between work and health is the Job Demand-Control model of Karasek (1979). This model, also known as the job strain model, reduces a divergent series of stressors at work to only two dimensions (Karasek & Theorell, 1990). Psychological job demands refer to job stressors such as the combination of high working pace and high time pressure (e.g. high workload). The other dimension; control or decision latitude refers to the possibilities in deciding how to meet the job demands, and comprises two sub dimensions: decision authority (the extent to which employees are able to take autonomous decisions on the job) and skill discretion (the extent to which people can utilize their skills at work). Karasek argues that a combination of both dimensions is essential for the development of strain and activity (Witte et. al. 2007). In

which high demand and low job control leads to high levels of strain and low demand and high job control should lead to low levels of strain (Taris & Feij, 2004).
Later published models did focus more on other fields discussing occupational stress. The effort-reward imbalance model proposed by Siegrist (1986) argued that an imbalance on fairness and equity (i.e. high effort/low reward conditions) is a cause for stress. As Bakker et. al. (1999) mentions an imbalance of high extrinsic efforts spent (e.g. job demands) and low extrinsic rewards obtained (e.g. poor promotion prospects) were associated with the burnout syndrome.
Hobfoll's introduction of his conservation of resources (COR) theory in 1989 (revised in 1993 by Hobfoll & Shirom) is influenced by the social learning theory of Bandurra (1977) and is based on the supposition that people strive to retain, protect, and build resources and that what is threatening to them is the potential or actual loss of these valued resources. Burn-out is caused by a state of resource depletion (Neveu, 2007).
Kompier & Marcelissen published their model for work, stress and health in 1990. In this model stress phenomena and stress outcomes occur through stressors in relation with the ability to manage the situation in which the employee can influence the stressors. In the most ideal situation the stress phenomena disappear because the employee absorbs the stress through the means of influencing the ability to manage the stressor.
The earlier discussed Job Demand-Control (JDC) model by Karasek (1979) predicts that psychological strain results from high job demands and low control over work tasks. High job demands are not necessarily problematic, but when combined with low job control, a reduced ability to cope with strain arises; in other words, a person's coping ability is diminished. The most common conceptual criticism is that the JDC model is too simplistic and fails to capture the complexity of a real-life situation (Bakker et. al., 2010). Johnson and Hall (1988, in Bakker, 2010) have argued that job control is not the only resource available for coping with job demands and proposed that social support from colleagues or superiors may also play an important role. Several studies do agree with this statement (De Lange et. al. 2003). Bakker & Schaufeli (2002) did add physical and emotional demands in the model.

2.7 The Job Demands and Resources Model

The failure of the Demand-Control model to capture the complexity of work environments has constituted the starting point of the Job Demands and Resources model (Bakker, Demerouti, Nachreiner & Schaufeli, 2001). The JD-R model is a comprehensive model that uses multiple aspects of the concepts discussed above. At the heart of the Job Demands-Resources model lies the assumption that whereas every occupation may have its own specific risk factors associated with job stress, these factors can be classified in two general categories (i.e. job demands and job resources), thus constituting an overarching model that may be applied to various settings, irrespective of the particular demands and resources involved (Bakker & Demerouti, 2006).
Job demands are the things that have to be done. Specifically; job demands are those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (cognitive or emotional) effort and are therefore associated with certain physiological and/or psychological costs (Bakker, et. al, 2004). Although job demands are not necessarily negative, they may turn into negative job stressors when meeting those demands that require high effort from which the employee has not adequately recovered (Meijman et. al. 1998 in Bakker, 2007) and will result in decline of performance. This decline is reduced through a heightened level of energy from the individual or increased subjective effort, or both (Hockey, 1993 in Bakker et al 2004). The more effort the person has to do to compensate the higher the psychological costs. Long term overtaxing of this compensatory strategy can lead to draining a person's energy or in the long run breakdown or exhaustion (Lee et. al. 1996). Common examples of demands are high work pressure, role overload, emotional demands and poor environmental conditions (Bakker, Emerouti & Verbeke,

2004). In similar vein, medical students can handle work demands for a certain period of time. But leaving them with no or little recovery time or the resources to replenish their energy (e.g. because of the long working days) this leads to high work pressures resulting in stress.
Research shows that for medical students there are many demands that can lead to anxiety and stress (Linn et. al. 1984; Toews et. al. 1997; Radcliff et. al. 2003). In their work Sarikaya, Civaner and Kalaca (2006) surveyed 201 Turkish medical students in their anxieties related to clinical training. A long list of demands was published. Examples of high scoring anxieties are fear of harming patients in giving them wrong treatment, helping with cardiac arrest, dealing with difficult patients such as terminal patients, drunk/abusive patients, psychiatric patients, sick children and also anxieties towards professional skills and rhythm such as getting up early, being up all night, interacting with nursing staff and residents and undressing patients of opposite sex (Sirikaya et. al. 2006).
On the other end job resources refer to those physical, psychological, social or organizational aspects of the job that either/or (1) reduce job demands and the associated physiological and psychological costs; (2) are functional in achieving work goals; (3) stimulate personal growth, learning and development (Bakker et al. 2004). Resources are not only needed for compensating job demands but are also important on their own. Resources can result in increased motivation because it fosters employees' growth, development and can play an important factor in attaining work goals (Bakker, 2010). Furthermore, work environments that offer resources create enthousiasm and desire to dedicate one's energy and ability to the work task (Meijman et. al. 1998, in Bakker, 2010).
The location of resources in organizations can differ. Organizational resources are for example salary, career opportunities and job security. On interpersonal and social relationship level support of the supervisor, co-worker, customer or family plays an important role. Other resources can be found in the organization of work (role clarity, participation in decision-making) and on task level (performance feedback, skill variety, task significance, task identity, autonomy). In other words, attaining guidance from a supervisor and support from co-workers can enhance reducing stress levels and thus increasing performance.
The potential of job resources (particularly on the task level) was already earlier recognized in a dominant model in motivational job design-job characteristics theory (JCT; Hackman & Oldham, 1990). The basic assumption of this model argues that five core characteristics (skill variety, task identity, task significance, autonomy, and job feedback) are positively connected to what Hackman and Oldham name; critical psychological states. Namely: experienced meaningfulness, experienced responsibility and knowledge of results. Experience of one or more of the states causes positive attitudes and responses towards the task and increased job satisfaction (Humprey et al. 2007).
Furthermore, studies done by Bakker et. al., 2003 and Hakanen et. al. 2006 have shown that job resources (e.g. support or coaching) can lead to work engagement, defined as "…the positive, fulfilling, and work-related state of mind that is characterized by vigour, dedication and absorption" (Schaufeli & Bakker, 2004). In a similar vein, the discussed conservation of resources theory (Hobfoll, 1989) argues that the prime human motivation is directed towards the maintenance and accumulation of resources. These resources are important on their own because they can be the instruments for achieving or protecting other valuable resources.
The role of personal resources in the JD-R model has long been neglected. Although it can be an important aspect of adaptation to the working environment, the studies done on the JD-R model have long been restricted to work characteristics. The first article published on enhancing the JD-R model with the personal determinant came from Xanthopolou et. al (2007). Their work recognizes that job-resources activate employees' self-efficacy, self-esteem, and optimism. Giving the employee the feeling of being capable of controlling its work environment (Luthans et. al. 2006) and in turn stay engaged (Hackman & Oldham, 1980). Personal resources can also lead to a prevention of experiencing stress and exhaustion, feeling able of controlling their environment can lead to a more positive appraisal of stress situations (Mäkikangas et. al, 2004). As

Xanthopolou et. al. (2007) recognizes, employees who work in a resourceful environment feel more capable to perform their tasks without excessive effort, and as a result, it is likely that they will not become overly fatigued. Thus the basic assumption can be made that personal resources play an important role in mediating between the psychological state of the person and the reaction on stressful situations.

Various studies have been done concerning to create an overview of the sources of stress that medical students experience during their progress in medical school. The stress factors given are numerous and seem indefinite. Furthermore many studies done under medical graduates enhance a period of over four years, in which the transition from preclinical to clinical education seems to be most stressful. Although this assumption is righteous of mind in itself, it lacks a clear model of what the medical student specifically experiences when entering the period of clinical training.

The overarching concept of the Job Demands-Resources model can be used in many different work environments. Although for the specific situation studied in this article the model is too broad, seeing the student's entry in a clinical training situation as an employee who starts at his job, the JD-R model is used creating the overview of stressors and resources in this specific context. Other work concerning anxieties and perceived stress related to medical training (Bridget et al., 2003; Sarikaya et al., 2006; Radcliffe & Hester, 2003) specifically discusses the situation of medical training in the United States & Canada, Turkey and England in which it makes it difficult to generalize among other countries because the context differs and thus demands and resources differ from the current research situation.

To create a specific model of the perceived aspects of stress felt by students at the head start of clinical practice two sub-questions are formulated:

- Which factors of the student's entry are perceived as stressful?
- Which factors reduce the level of stress experienced by medical students?

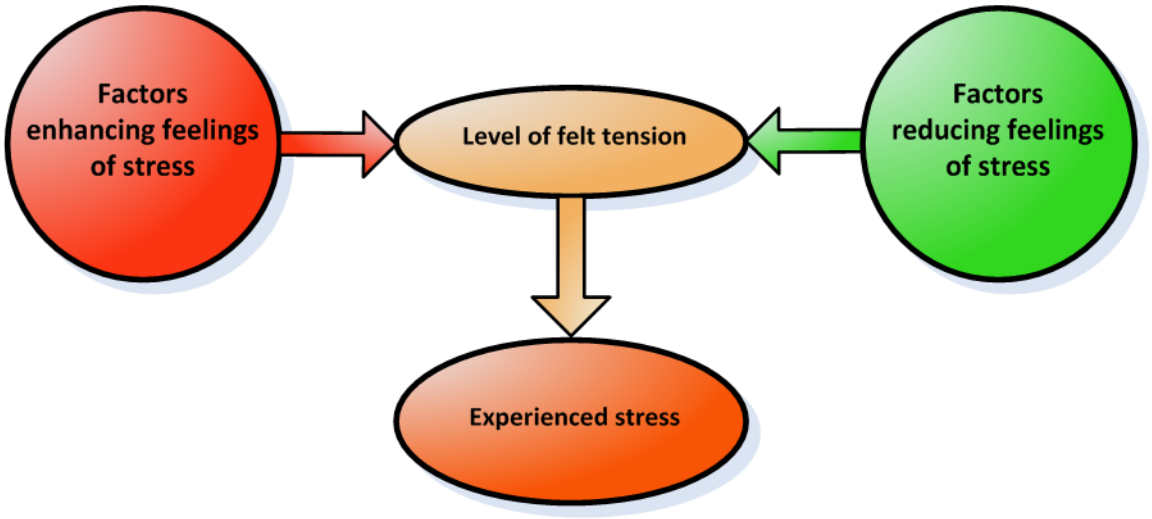


Figure 1 Stress model

3 Research methods

3.1 Research Design

The main objective is exploring the different aspects of stress felt by medical students entering the clinical training phase. Earlier research concerning stress in a more general form is done both quantitatively (Sirikaya, 2006, Toews et al., 1997) and qualitatively (Radcliffe & Hester, 2003). Because of the specific situation focused upon in this research (feelings, emotions, personal opinions) the choice was made to explore this qualitatively and not using known questionnaires. Using these questionnaires would enhance the probability of finding already existing results, based on the available literature outcomes. The aim was to get an overview of relevant factors and potentially new aspects of experienced stress. Semi-structured interviews were used to ensure that the interviewee could discuss his or her experiences freely. Furthermore qualitative research was essential because of the usage of the context dependent Job Demands-Resources model.

3.2 Medical education in the Netherlands

In the Netherlands undergraduate medical education consists of a six year study. The first three years the emphasis is on gathering medical knowledge, from the fourth year on the shift is made from theory based learning towards a real-context situation. For the medical student this means a shift to learning to apply knowledge and give patient care. In Groningen, the fourth year is called a junior clerkship consisting of 4 different and independent clerkships, each lasting for a period of 10 weeks. Year five consists of senior clerkships and the in the sixed year the students is obliged to do the first six months a semi-intern clerkship and a research project for the other half of the year.

3.3 Participants

This research solely comprehends participants from the fourth year. The student coordinator of the Medicine Master Education program contacted and presented multiple students from the UMCG and Martini Hospital. Students that participated in this research were in their fourth year of their study, which means their first year of clerkships. They recently made the switch from preclinical to clinical training. The main objective of this research is to get a better and deeper understanding of the specific aspects of what students experience when they start their clinical training.
Students participating in this research were informed by means of an e-mail about the background and content of the research. To get a comprehensive picture of the perceptions the participants varied in range of being in their very second week of clerkship till the last week of their third clerkship. Thus information was gathered from students who just started and from students who could benchmark more using his or her knowledge of later clerkships to look back upon the first. The research population consisted of two male and five female students. The point of saturation was used to establish the amount of interviews done. Baarda, Goede and Teunissen (2005) together with Strauss and Corbin (in Boeije, 2005) agree that this is a proper way of establishing the amount of respondents interviewed. After six interviews no new information came up. To be certain, interview seven was held in which again no new aspects came up.

3.4 Data Collection method

The interviews lasted between 50 and 70 minutes and were conducted in the university hospital. A literature review gave major topics that were identified as being stressful in clinical training. Only the interviewer had this list of topics,

the interviewee was free to discuss his or her experiences regarding clerkship. The interviewer did take care that in the end of the interview every topic did receive attention. Main topics that were discussed were first time clerkship experiences, demands, resources, support received, expectations on forehand and in case of the four respondents interviewed after their third clerkship their attitude differences regarding the clerkship. The topic list was adjusted and modified regarding new insights and experiences based on previous interviews. Confidentiality was guaranteed, any identifiable features from interviews would be removed from the transcripts. Every interview was, with approval of the respondent, recorded and transcribed verbatim.

3.5 Data analyses

The transcribed interviews were all labeled through the basic principles of the grounded theory (Straus and Corbin, in Boeije, 2005) and examined using the software program ATLAS.ti (Callery et. al., 2005). The initial step was open coding, which is by Strauss & Corbin described as “breaking down, examining, comparing, conceptualizing and categorizing data”. This labeling, in text fragments, resulted in 117 different codes. The second step is called axial coding, “a set of procedures whereby data are put back together in new ways after open coding, by making connections between categories”. After main categories have been identified the last phase is selective coding or “selecting the core category, systematically relating it to other categories, and filling in categories that need further refinement and development”. In this final phase emphasize is on integrating and making connections

between the categories resulting in overarching themes. These overarching themes were interpreted and if needed modified. These overarching themes were used to create a network of factors that, at a global level, are used to indentify different stress factors. The outcomes are discussed in the next part.

4 Results

4.1 Using the term stress

All the students interviewed reported in their first period of medical training aspects of stress. In most cases the student did not use the term stress, although from the interviews the transition period can be identified as stressful. Stress as a term for students has a negative connotation, which they do not prefer to use (example 1). More often students identified the transition period of being scared of the new situation (2), being tensed or nervous (3,4) or reporting it as overwhelming (5,6).

1. *"The first clerkship was tough, because it's all new and you'll make long days. (….) It's about making long shifts and it's really tough to get used to the rhythm. So there is a form of pressure, but not really stress I think."*
2. *"The first time I found it very scary and exciting. The first years of study you are really taken by the hand, and now you are there on the floor on your own and new as a clerk. This is the moment I have to bring it into practice. So that's pretty scary."*
3. *"I feel especially tensed because it's working with people. You don't know how they'll react and behave."*
4. *"We were in the dressing room and everybody was very nervous, nobody knew where to go or what to do. It was awful. I hoped there was just one person to calm us down and would say everything was going to be all right. But that was not the case; we were thirty very nervous clerks."*
5. *"Everything is very different, the form of education, the terminology is different, it's a bit overloading."*
6. *"Sometimes when I get home really tired I wonder what I really did that day. Effectively not that much, but all those new impressions, everything new. It is pretty overwhelming."*

Not all aspects of the transition were perceived as negative, some stress effects were seen as positive. Students reported that the pressure of continuously being alert caused them to being more able to focus their minds (7,8).

7. *"When the supervisor told me I had to do my own patient it gave me a form of positive tension. I really felt I had to be very aware, that gave me a good feeling"*
8. *"If a doctor asks me "what is this", I really want to give the answer. It's almost as if they can read minds, if you don't prepare; they will ask. It is causing certain awareness."*

4.2 Demands

Although some stress is perceived as positive, most stress was seen as a negative aspect of clerkship. What is the cause of this negative stress felt by clerks, or in conformation with the used Job Demands-Resources model, which demands can be indentified as being stressful? As a result from the interviews, perceived causes of stress can be divided into five main themes: pressure of work, pressure of taking on the professional role, pressure of (non) guidance, personal pressures and general pressures. Because using the word stress was avoided by the participants, the themes carry the term pressure.

4.2.1 Pressure of work

All students described the *length of the working days*, and having to be present early every day; thus *getting used to the working rhythm* as a significant source of stress throughout the start of clerkship (9,10,11).

9. *"Sometimes I was really worn out. At anesthesiology it was tough, very long working days. You start at half past seven and hopefully you'll get out at round half past 6. And when you get out it's already dark! When I get home I'm still busy in my head, at some point you get really tired."*

10. *"Often I started before the clock ran to eight. At the ward, to be in time, I left at around half past seven, eight o'clock. So it just about the long days you make, getting used to the rhythm."*
11. *"The days are long; I haven't got that much time for social activities anymore. It's really getting used to hospital schemas."*

The pressure of work during clinical training did not end when the shift was over and the clerk did get home, to compensate the lack of medical knowledge most clerks reported that *revising and preparing in the evening* for the day afterwards was felt as being demanding (12,13,14).

12. *"But what I found really difficult; it was a long day from eight to six and then I get home and have to prepare for the next day. Maybe this is not done by every clerk, but I want to be prepared. Looking up illnesses or syndromes, making a model status or preparing a policlinic. When I get home my day is not yet over. I was busy doing clerkships from the moment I get up to the moment I went to bed."*
13. *"When I get home, first thing I did was going to get my medical books and study. Searching for what I had seen that day. It is necessary too; the doctors are going to ask questions the next day."*
14. *"Most of the times I had to prepare myself for the following day, when you are at surgery you want to know your anatomy."*

4.2.2 Pressure of taking on the professional role

Acting as if one were already an actual doctor was often mentioned as being stressful. Most students did not ever work with real patients before and tried hard to be seen as a competent and confident future doctor when *interacting with patients*. The expectations the students feel when *putting on their white clerk coat* for the first time and the *seriousness of dealing with real patients* is felt as demanding (15,16).

15. *"For patients, when I put on my coat, I am the doctor; they expect you to know what you're doing. I feel the pressure of not saying or doing anything stupid"*
16. *"For me what is causing the most stress is that from now on it's all serious. It's not like, "let's quickly finish it", no it's about real people, real patients and life and death."*

Other than the felt expectations and realizing that the training period has turned into real practice, multiple aspects of working with patients were explicitly mentioned as being stressful; *working with very ill patients* and especially with ill children, *not be taken serious as a clerk, being uncertain regarding ones own position towards a patient* and *difficulties towards physical examination* especially when examining the opposite sex.
For most students the most important reason to study medicine is curing patients. This main aspect causes the students reporting dealing with very ill patients, being too emotionally involved and attached towards patients and keeping distance was seen as a very demanding factor (17,18,19). Specifically working with ill children was a cause of stressful feelings (20,21). Although already outside of the hospital some clerks indicated that in their mind they were still concerned about the well-being of some patients (22,23).

17. *"I found it hard to be in the department of neurosurgery, all those severely ill patients. At a moment I decided not to be at the intensive care for two days. However, you can not escape from it, all the cases are discussed during the hand over period."*
18. *"When I was in the oncology department, I found it difficult to keep a certain distance from patients that I treated during that day. A woman came to me all crying, that really touches you."*
19. *"Last clerkship we had a patient that died. Really sudden. The day before I had talked to him and seen him alive and the next day during the hand over they me told he passed away. Just one hour later I stood at his autopsy researching his body. That is very strange, the day before I was standing at his bed and he was*

alive and now I was at the mort while he was dead and I was holding down his organs. It gave a very awkward feeling."

20. *"I really had to learn to keep some distance from patients, especially from children. It started when I was in my first two weeks at the ward. I had my own patients; you make your daily round and discussed their status during hand over so I did get really involved with those patients. However these are extremely ill children, I really have to keep that in mind."*
21. *"At pediatrics there were some very sick children, that was what's making it difficult. About one child there was an intense discussion about applying euthanasia. I found that really difficult. It where my first two weeks and all sudden it's about life and death and children are dying."*
22. *"It was really tough at the start, in cardiology and oncology. Very severe heart defects. The first weeks are hard, it's just overwhelming. They can educate in it, people can talk to you about it, but you have to let it go when you're going home. But once confronted with these issues it's hard to easily get it out of your mind."*
23. *"When I assisted the doctor on his round on the radiotherapy department and saw all those little children that did receive radiation therapy, I found it terrible to see. After that day I was devastated. In the evening I couldn't get these images out of my head."*

For a newly arrived clerk it is difficult to handle such severe cases as described above. For more experienced personnel it is a more daily routine and they have already found a way to handle it. The clerk has to quickly adjust to this situation and create a certain distance towards patients (24).

24. *"The residents that supervised me where already there for a longer period. I think they can handle those situations better. Of course, they talked about it. And sometimes it's just frustrating. Often they made some fun of the patients. The very first day it was told to me that this is the way to handle it. They said; don't take it personally, and don't think what an impersonal and insensitive people we are. Create distance, that's what it is about."*

As a first year clerk, he or she is the freshman of the department. The uncertainty, lack of medical knowledge and the missing experience do not contribute to the wanted image of being seen as a competent doctor. These aspects and the often youthful appearance of the clerk all contribute as not being taken seriously by patients. The lack of confidence in a clerk spoken out by a patient is seen as a demanding factor (25,26). To get confident and familiar with ones position as a clerk regarding a patient is something every student in one way or another is confronted with (27). The handling of these situations for a clerk is different; some clerks choose to "bluff", others to back down (28,29).

25. *"It is frustrating that when I introduce myself and explain that I will do the intake a patient reacts "oh, I didn't expect a clerk, I want to see the real doctor."*
26. *"(…) Especially when I talked to the parents about their child they immediately asked "when does the real doctor come, I want to see the real doctor". It's not hard to understand their reaction because it concerns their child, but that's not something you want to hear."*
27. *"Often I find it difficult to decide how far I can go asking things. Last time I had a patient and she told me that her sister past away, but that's not what she was coming for. I thought, this is none of my business. Later on the doctor explained that it is important that I should have asked about that thoroughly."*
28. *"When for the first time I had to drip an infusion on a patient she asked if I done this ever before. I said and pretended that I did. If I told her this was my first time, the patient would be nervous and it would have gone wrong for sure. Sometimes you have to bluff a bit."*
29. *"Some patients are sitting one the other side of the table with an attitude of "you are a freshman, so don't dare to interrupt me." Although I'm sitting on the other side of the table and a doctor would have interrupted a patient but as a clerk I thought "can I interrupt" and in end I don't."*

Another demanding aspect of interacting with patients is doing physical examination. Most students acknowledged the feelings of awkwardness the times they perform bodily research. All sudden they have to take the initiative to let the patient undress for research that a clerk is going to perform. Especially intense physical examination and examination on the opposite sex are seen as stressful (30). In these situations clerks feel ill-at ease, are not sure of themselves and feel the pressure of doing it right the first time and perform the examination quickly because of the felt vicarious shame (31,32,33).

30. *"In the beginning I was scared to death of asking a patient to remove all his clothing and telling him to lie down, so I can examine him. Especially when it concerns a man of around his forties. It felt very awkward; I'm just a girl of 23."*
31. *"For me the scariest part was performing physical examination, because I'm not sure of what I'm doing. Doing an intake is one thing, but to perform an examination on a real person is something different."*
32. *"I mean in the gynecology department everybody acts as normal. But for me it is all new and pretty intense. For instance doing vaginal examination, it has to go right the first time, you can't say to the patient "I'm sorry Miss; we will have to do it over again."*
33. *"In the beginning doing physical examination takes a lot of time. The doctor is finished in just a few moments but when I'm performing it, it feels like taking forever. It feels very awkward to see the patient undressed lying before me."*

Despite all the effort of trying to look and be competent it is frustrating that in most cases this does not lead to being seen as a sort of colleague for a doctor but always as "just" a clerk. This becomes clear in another factor of taking on the professional role; *lack of responsibility*. Not being allowed working with patients (34), expected to watch all day (35) or only doing the intake makes it difficult to keep focus and is a cause of stress. Furthermore, students have been preparing for three years for the moment they can apply their knowledge and skills in the hospital. Therefore it is understandable that this is a factor of frustration (36,37).

34. *"I'm not allowed to drip infusions. Most of the time I'm doing administrative work like filling in forms, like letters of recognition or referral."*
35. *"Most of the time it is just watching, in the end there is no responsibility at all. For a future clerkship I hope to go to a smaller hospital, here it is just watching and more watching."*
36. *"I want to perform duties, but I'm not allowed; that's the worst thing."*
37. *"The first days the only thing I did was sitting on my crutch. These are terrible long days."*

Associated with responsibility but a different and the last factor of the pressures of taking on the professional role is the feeling of *not making a contribution* towards patient care and being helpful. The student who is not allowed to perform any duties and can only watch others feels useless in helping patients (38,39,40).

38. *"In the end I haven't got any responsibilities, sometimes I'm thinking to myself "what I'm I doing here". You want to make yourself useful, but you aren't."*
39. *"And in my department, they didn't even miss me when I wasn't there. Nobody cared at all; I was just in their way."*
40. *"Sometimes it was crowding with patients and everybody was busy, but I couldn't do anything. I was doing nothing."*

4.2.3 Pressure of (non) guidance

Besides the pressures of work and taking on the professional role, many students particularly mentioned a perceived lack of guidance as a significant source of stress. In the previously discussed part it became clear that a lack of responsibility caused the clerk feeling useless and was a demanding factor. However, when the clerk is allowed to perform duties another problem arises. From the interviews it became clear that the expectations of a

freshman are unclear and ill-defined. The lack of clarity and vagueness about the expectations for a clerk increases uncertainty of what tasks to perform and to what extend. This is causing *task ambiguity* (41,42).

41. *"Every time I think about what I shall do next. There is no routine whatsoever. Every time again I'm doubtful; shall I go with the doctor or should I perform own duties? Nothing is certain."*
42. *"The problem is that you do not know at all what is expected of you. That's what's costing a lot of energy."*

The source of task ambiguity can be found in the contact with supervisors. He or she specifically should be the one who sets boundaries and makes clear what duties to perform. In most cases these expectations for the students become not clear and are described as vague which increases stress, especially when patients are involved. The first aspect of task ambiguity is the *lack of clear expectations from the supervisor regarding medical knowledge* which is making the students unaware of what medical knowledge he should posses (43,44,45).

43. *"The first few days felt like an investigation! That was pretty hard. After we made an X-ray the specialist started to ask me all kind of questions. I didn't know I had to know all that."*
44. *"We went to surgery. Once there, the surgeon started asking questions. We only wanted to watch, but he didn't accept that and told us if we wanted to watch we should have been prepared; know the anatomy, know the syndrome, everything."*
45. *(…) "The doctor was starring at me and I felt him thinking "why do you not know these facts?!" But how in the World should I have known this?! Nobody ever told me."*

That the clerk is the freshman in a department is something doctors like to put some emphasis on. When the supervisor did speak out his expectations, students made the remark that most of the time comments were disdainfully brought (46,47,48). The category that covers this aspect is *negative supervisory contact.*

46. *"The little remarks are most annoying "you should have known this" or "this would have taken you 45 minutes instead of an hour".*
47. *"Some doctors just have that attitude of "you're not able, you're just a clerk"*
48. *"From other students I heard that they sometimes are humiliated "this is something you have to know!"*

Besides the lack of clear expectations a second issue plays a role in task ambiguity; the lack of guidance from the supervisor. With no specific help from the supervisor, the student does not know which tasks he is allowed to perform to enhance his skills. Being assertive can compensate to some extent (see: 4.3.3: Personal features, 103). Although in the end structure has to be created by the supervisor. *Lack of guidance from a supervisor* is a significant source of clerkship stress (49,50,51). From the interviews it became clear that a lack of guidance was not restricted to supervisory contact. Hence, another explicitly mentioned demanding factor during the transition was the *lack of guidance from medical school* (52,53).

49. *"Sometimes it's like swimming in the ocean. After the hand over the doctors get up and leave. All the clerks are still sitting there. The doctors are off to the operating theatre and you don't see them the rest of the day and we wonder what to do."*
50. *"What is frustrating is that some doctors refuse giving explanations. The only thing they say is "look it up for yourself". Some things are just hard to look up and you just want to know."*
51. *"Most of the time I never saw the people who should asses me. I had no relationship whatsoever with them. That's also difficult for the supervisor; on what grounds is she able to asses me. That is something what can use some improvement."*
52. *"You're not being well prepared for the first days. Only thing that is made clear is the location and that you have to wear the white coat."*

53. *"Only thing I received was an e-mail and a letter where I should be and what I should wear, that's it."*

One of the most important aspects of doing a clerkship is working in patient care and learning from new situations and patients. In doing so, getting valuable feedback is essential. Especially when performing an activity for the first time it is crucial for the learning aspect that effective feedback is given. When receiving the right feedback, anxiety of performing a similar particular task next time can be reduced. Therefore it is understandable that clerks found it frustrated that in some cases *no effective feedback was given by a supervisor* (54).

54. *"What I find difficult is that I never hear if I'm doing my things right or wrong. It would give me more confidence if I knew how to handle certain situations."*

Interacting with doctors, supervisors and other hospital staff, means interacting with people who have more experience, knowledge and influence. Every hospital has got a unique form of hierarchical structure and a clerk has to find its own place in it. Interviewees reported that related to the aspect of interacting with medical staff another factor of adjustment was the *handling of the medical hierarchical structure* which, in some cases, turns into anxiety (55,56).

55. *"What I found difficult is the fact of how to position myself in presence of a doctor. How should I call him, am I supposed to ask questions or should I remain quiet. Should I be very dependent or independent?"*
56. *"When I was in the operating room I kept some distance, but when the doctor was away I started asking questions. Later on I thought by myself, why I didn't dare to ask these facts when the doctor was there."*

4.2.4 Personal pressures

Alongside the pressures of work, taking on the professional role and (non) guidance which clerks are confronted with from within the organization, there are personal factors that are a source of stress. After three years of education, the moment for exploiting the gained knowledge and applying it to situations has come. Therefore, once started with clerkship, many clerks feel the *internal need to excel* and tend to show signs of overly ambitious behavior which increases the emotional pressure they put upon themselves (57,15).

57. *"I want to be a good clerk, get high grades. Not only for the doctor approval but also for myself. Above all, putting on my white coat brings along patient expectations."*

Closely related to ambitious behavior is the *fear of failure*. Wanting to be an outstanding clerk or being afraid of critique causes anxiety of making mistakes. In search of positive feedback a minority of clerks perceived making mistakes was something terrible (58,59).

58. *"My first clerkship, I was certain that I would not make a mistake. It's just not acceptable."*
59. *"I was afraid of doing it wrong, afraid that he (supervisor) would be angry or give me an incompetent feeling."*

Despite having practiced on simulated patients and each other in the preclinical phase, putting actual patient care in practice is a totally different aspect. Recognizing syndromes and applying knowledge is an aspect that clerks have to get familiar with (60). Therefore an internal pressure that causes strain is the fact that when being in a clerkship, the clerk often feels himself as incapable of bringing good patient care (61), the clerk feels having *insufficient factual knowledge* (62,63,64) and is *lacking the required medical skills and handling of medical instruments* (65,66,67). This feeling causes unrest and uncertainty, which can lead to the feeling of not being in control of the situation which is a significant source of stress (68).

60. *"What you learn is when someone has appendicitis the patient feels pain here and here and is having a fever. But now it's thinking the other way around. The patient*

says my pain is somewhere around here and I have to discover that it looks like having appendicitis.

61. *"I had never heard an abnormal lung; I just described what I heard. Seemed he suffered from pneumonia. I didn't discover it. Fortunately they checked, otherwise I don't want to know what the consequence had been."*
62. *"And then you realize that all the standard facts I learned are not applicable in 9 out of 10 situations! Sometimes it's frustrating that there is an enormous gap between book and practice."*
63. *"One time, I thought "Yes! I know it"! I examined the patient and everything fitted in the syndrome. I was all happy and went telling the doctor what I found out, seemed I missed a thing and it was a whole different syndrome. And before that, I was so happy that I had noticed it."*
64. *"For me that's the main theme in clerkship, feeling dumb everyday."*
65. *"For instance, using a stethoscope right is something you can only learn by applying it with real patients. Then you're told how to use it the right way."*
66. *"Little aspects make me feel like just a clerk, not pushing hard enough when doing physical examination or not hearing anything when using the stethoscope."*
67. *"The first time I listened to a heart I didn't understand anything of it. Only heard strange noises and first time I did foot research I didn't know where is should look for."*
68. *"It is stressful, because every time I examine a patient I keep thinking if I'm doing the right things."*

Prior to clerkship it became clear that own *expectations about functioning as a future clerk* (69,70), having the factual knowledge (71) and interacting with hospital staff (72) were significant sources of strain.

69. *"I delayed my clerkships for a year, insecure about how I would be as a clerk. Afraid I would fail."*
70. *"I heard from others that hospital staff would say; "here, these are your two patients and manage it." I thought "help, this isn't going to work at all"."*
71. *"Prior to clinical training, I was insecure about the level of medical knowledge I should posses, if I'm going to be tested by doctors or if I would run into syndromes that I never heard of."*
72. *"I expected more shouting and angry doctors, that's what you always see on television. I heard that as the lowest one in rank the doctors would be cranky all the time."*

The final internal pressure is the aspect of *reality not meeting clerk expectations*. Being new in a hospital surrounding a clerk is especially focused on giving the best patient care possible. When it turns out, that hospital staff also has to get a certain amount of work done, which could be detrimental of optimal patient care, reality could turn into disappointment (73). Looking forward to a certain period of clerkship with loads of patients to be treated and cured, it is a disillusion when it turns out to be otherwise (74).

73. *"The picture in my head was way too romantic. I am someone who appreciates communicating with patients. But in the hospital, patients turn quickly into a number. I'm not allowed taking time for a patient, although during preclinical training we are being taught gathering as much information as we could; thus asking loads of questions."*
74. *"I loved surgery, but that was a disillusion. I was expecting spending much time in the operating theatre. But reality was different, just a few patients and operations to be done. I was mainly doing administrative stuff."*

4.2.5 General Pressures

Besides the pressures that are put upon the clerks from within the organization (pressure of work, taking on the professional role, (non) guidance) and the internal pressure clerks put upon themselves (personal pressures) the final dimension of strain causing factors are categorized as general pressures.
Being in a new situation, experiencing new impressions and meeting new people can cause a form of stress. The clerk is

unfamiliar with the situation, does not know where to go and how to behave and that causes a feeling of not being in control. This *newness of the situation* (2,6,75) causes a feeling of anxiety. Within clerkships this is something that does not occur once, every time a clerk switches from clerkship he or she encounters the same issues over again. Clerks responded that this *rotation of clerkship* (76,77) was felt as demanding.

75. *"In the evening I was just worn down, all those new impressions and being busy all the time."*
76. *"Every time it's new, new patients, new experiences and new faces. Introducing myself to everybody over and over again costs a lot of energy."*
77. *"I was just accustomed in my department, knew what my tasks and patients were and then I had to move and start all over again. That's what I found most stressing, the moving between clerkships. Just when you feel at ease you leave and you can start from scrap again."*

What all clerks mentioned as demanding is the abrupt change in their lives. New rhythms, spending much time in the hospital and being responsible for getting enough sleep are the cause of re-assessing how to use their available time. The balance is shifted from the freedom to initiate social activities to a working rhythm. Clerks want to maintain an active social life, and at the same time want to be well prepared for the next day and be fit for the early clerkship (78,79). More than half of the respondents mentioned they had difficulties planning to see friends or had some time for themselves. Thus to manage a satisfactory balance between the *work-private life* is something the clerk has to get familiar with and is, especially at the start, causing friction (80).

78. *"The sudden change in my life is what asking more awareness. First the student life and then clerkships. It's difficult to make a satisfactory combination, especially because my friends are still in the student rhythm. They want to go out and get some drinks, but then again I can't because next day the alarm clock is already ringing at seven."*
79. *"When I'm out I take care of not drinking that much wine and say around 10 that I'm leaving. Before, it didn't even cross my mind. When I had college it was no problem, but now it is."*
80. *"The turn-around was pretty intense. From a relaxing living style to a tight daily interval rhythm. My social life was almost non-existent."*

Some clerks reported that once getting home they found it *difficult to relax*. The handling and processing of new experiences, situations and people does not stop when the working day is over. Some clerks reported that they were emotionally worn out and, as a consequence, did not have the energy to engage in social activities (81,82).

81. *"I found it difficult to relax after a working day. When I get home, it's still about clerkship; I have to do this, think about that. Then I go to bed at around nine, watch some television and do nothing. The first days I really thought; is this what clerkship is about."*
82. *"I was just very tired, not especially physical but more mentally. Only thing I wanted to do was sleeping."*

A last factor of general demands, which has multiple interfaces with the demanding aspects of not making a contribution, lack of responsibility and task ambiguity is the *feeling of being bored*. A lack of patients, a lack of work or doing the same activity over and over again can cause a different kind of stress within the clerk, the stress of boredom (83,84,85).

83. *"The days are very long if you have to do the same trick fifteen times a day"*
84. *"It's much harder to do nothing than to work hard all day, you get really fed up watching nu.nl for three hours a day."*
    "When I was at gynecology and no baby was born, we and the nurses were just sitting there doing nothing. Fortunately I am a girl, but another clerk was a man and also sitting there just hearing stories about hair-cuts and nails."

Pressure of work	Taking on the professional role	Pressure of (non) guidance	Personal pressures	General pressures
Length of the working days	Interacting with patients	Task ambiguity	Internal need to excel	Newness of the situation
Getting used to the working rhythm	- Putting on their white clerk coat - Seriousness of dealing with real patient - Working with very ill patients, children	Lack of clear expectations from the supervisor regarding medical knowledge	Fear of failure	Rotation of clerkship
Revising and preparing in the evening	- Not taken serious as a clerk - Positioning towards a patient - Physical examination	Negative supervisory contact	Felt insufficient factual knowledge	Balancing work-private life
		Lack of guidance from supervisor	Felt insufficient medical skills / handling medical instruments	Difficulties to relax
	Lack of responsibility	Lack of guidance from medical school	Expectations about own functioning as a clerk	Feeling of being bored
	Not making a contribution	No form of effective feedback from supervisor Handling of hierarchy	Reality not meeting clerk expectations	

Table 1 sources of strain,demands

85. *"It's much harder to do nothing than to work hard all day, you get really fed up watching nu.nl for three hours a day."*
86. *"When I was at gynecology and no baby was born, we and the nurses were just sitting there doing nothing. Fortunately I am a girl, but another clerk was a man and also sitting there just hearing stories about hair-cuts and nails."*

4.2.6 Overview of the sources of strain, demands

At the start, doing clerkships is being seen by clerks as a demanding period. An overview of the sources of strain is given in table 1.

4.3 Resources

The many demands and potential stressors that a clerk is confronted with, make that a reader might think that these sources of strain are too exhaustive and demanding for a clerk in a new phase of their training. However, on the other side of the balance the resources cause a leveling effect. Hence, the demands do not become overly intense and cause feelings of stress thus reducing the negative outcomes of stress. The resources diminish demands and counterbalance the pressures of clerkship. Resources that diminish the felt level of stress are social support, organization of pre-clerkship, personal development, personal characteristics and general resources.

4.3.1 Social support

The first aspect of resources is social support. In every new situation it is important that one does not experience the feeling of being all alone. Knowing that friends, family and peers care about you can create a secure feeling and prohibit an open attitude for experiencing new situations. Hence the feeling that one is part of a group; that colleagues are going through the same difficulties and the (emotional) comfort given by co-workers are important aspects in reducing and handling stressful experiences. From interviews it became clear that *social support from co-clerks* is the most essential aspect of support (86,87,88).

87. *"Every morning you run into other clerks, it creates a feeling of belonging to a group."*
88. *"At lunch breaks we are there with more than 40 clerks. Within five minutes you can talk to someone to tell story."*
89. *"We just understand each other. If I run into something, and you are not a medical student you just don't understand. We've got a certain form of humor all together."*

An organized aspect of social support from fellow clerks is the once weekly held *coaching groups*. A number of clerks,

who are in the same phase of clerkship, meet once a week to talk about their experiences in a protected setting. The reactions to these meetings are somewhat mixed. Where one clerk recognizes coaching groups as a source of motivation (89) or a moment to blow off some steam (90), the other finds it somewhat artificial (91).

90. *"Coaching group can be very motivational, just by saying "that's really bad for you right now, but also try to enjoy a bit. Just some motivation once in a while."*
91. *"It helps to talk about prior experiences from the department I had, and to hear others have the same problems and run into the same frustrations."*
92. *"Once a week we talk about the things we encounter, the idea is great although in practice it sometimes feels a bit forced. Maybe it's just about some fine-tuning, but there's definitely room for reflection."*

Where literature explicitly talks about social support as the (emotional) comfort given by peers and friends, in case of clerks it seems that support from peers is of significant importance in comparison with support from friends. The respondents mentioned that friends did not have the understanding one did feel from other clerks (92).

93. *"Others don't really understand. My club mates always ask if I have exciting stories from the hospital, if something rude happened. But that's not the way it goes. I'm not telling them these kinds of things. The only reason they ask is because they hope for a thrilling story, while other clerks really know what you feel."*

Though the contact with the supervisor is mentioned as a negative experience by more than half of the interviewees (see 2.3; Pressure of (non) guidance), some have positive experiences with a supervisor. When attaining the approval or compliment from a doctor this could lead to a more secure feeling and could enhance the learning process through the situation that a clerk feels comfortable asking questions and be studiously. This enthusiasm could initiate interplay with the supervisor, which could turn into a significant form of *supervisory support* (93,94).

94. *"The supervisor gave me the idea that for a clerk I wasn't that bad. I found that really important. For me, half of the stress was then gone."*
95. *"He started asking questions in a respectful manner, he really went into specific cases and challenged me in a good way. That became very stimulating"*

4.3.2 Clinical Training

Although no interviewee explicitly mentioned their learning phase during the preclinical period as something that caused less stressful feelings, it can be seen as a resource. The period before the student gets in the department plays a significant role in preparing the clerks

for clerkship. In the preclinical phase students practice in the *clinical training centre* (CTC) with simulated patients, each other and learn how to behave and handle in emergency situations. While this period is characterized by simulation, the future clerk is given some fundamentals for the coming clerkship (95,96).

96. *"In the CTC we did practice with heart examination and some intimate examination. With as a final goal doing physical examination on patients once started with clerkship. It's good to be the patient at first and being examined, you realize that it's also difficult for the ones not wearing the white coat."*
97. *"In the beginning it is causing discomfort doing physical examination on co-students and I was asking myself how to handle it. Though patient care can only be learned by doing it, in the end I think the time in the CTC was useful."*

4.3.3 Personal development

Alongside social support and the prior education a clerk can counterbalance the demanding side of clerkship through usage of multiple internal resources. Closely connected to the social support of peers, is the reassurances from *benchmarking* clerks attain from hearing others talk about their experience, can draw the conclusion that it is not all that bad in their own clerkship and attain a more realistic view on clerkships (97).

98. *"When I hear others talk about their clerk period it's nice to know what they had to do. Sometimes things are not as you expected, for instance lengthy days in de operating theatre. Then I heard other clerks do their story and thought "let me go back to the OR, because that's not that bad at all"."*

That the student is not yet on the same level as a doctor is something which one can take for granted, though this is often felt by the student as feeling incapable (see 4.2.4: Personal pressures, 63,64) or not contributing to patient care (see 4.2.2: Pressure of taking on the professional role, 40). Along the way, the student realizes that this is something one should not expect of themselves and start to learn *to see clerkships in perspective* which is substantial in handling stressors (98,99).

99. *"At first I looked at my supervisor and thought "wow, they know everything, why do I not know this stuff". But now I see it more in perspective, they have over 40 years of experience in patient care and that makes a big difference."*
100. *"My biggest mistake in the beginning was that I compared myself to doctors. That makes you really unhappy. Feeling dumb all day is not a nice feeling."*

4.3.4 Personal characteristics

From the interviews it became clear that having a number of personal skills can contribute to create a more enjoyable clerkship. For interacting with patients, peers and supervisors good *communication* (100) skills are essential. Having an *enthusiastic* attitude and show signs of *assertiveness* were highly valued and mentioned as factors that can create a good atmosphere between the clerk and supervisor (101). These skills can enhance interplay with a supervisor which can lead the clerk being more and more closely involved to certain patients which consequently leads to gaining more learning experiences which otherwise would have not being attained (102,103).

101. *"You get more things done when you are a good communicator. A little chat with patients or peers everyday makes it just easier."*
102. *"It's really that you create your own clerkship. If you are interested and be enthusiastic you can get more out of a clerkship than the ones who aren't."*
103. *"If you are not enthusiastic they won't ask you to have a closer look and do extra tasks. Most of the time these extras make the clerkship more enjoyable."*
104. *"I think they like it when you ask to do something yourself. It is not allowed every time, but once I had a doctor who said that it was ok and I could listen to the patient first and afterwards he would say if I was correct. I think that showing initiative is the reason for getting me a higher grade."*

4.3.5 General Resources

Alongside social support, organization of pre-clerkship and personal features there are several general resources that counterbalance the pressures that a clerk has to withstand. General resources reported by clerks are prior experience in a hospital setting, temporariness of clerkship and the magic of medicine.

It makes a difference if working in a hospital setting is a novelty or not. In most cases the clerk is all new and encounters many new experiences. A minority of clerks reported that they had *prior experience with working in a hospital*. Though it is not necessarily working with patients, hence spending lengthy days in a medical setting and getting used being around patients consequently leads to less novelty pressures for a clerk (104).

105. *"I had a part-time job in the hospital, moving patients from one place to another and bringing food around. It helps when you start your clerkships. Not specifically in that department where you end up, but it's more that you recognize the structure and how to address doctors."*

For a clerk, the idea that a clerkship will last a limited period of time, can help to reduce the pressures and can get the clerk get more easily through that period. Although this factor has a negative side to it, the rotation of clerkship takes a lot of energy for introducing them selves and getting to know every aspect once again, it is a definite resource (105). While the period of time is one factor, the idea seen from more experienced clerks that future clerkships becomes easier due to overcoming the initial problems, strengthens the clerk in his or her state of mind to bear the novelty pressures (106). The category that covers these aspects is *temporariness of clerkship*.

106. *"I didn't like my surgery clerkships. I do not want to become a surgeon at all. Fortunately it's only five weeks and than I switch to pediatrics, that's one I'm really looking forward to."*
107. *"Last clerkship I had to cooperate with another clerk who had more experience in doing clerkships. I saw that she knew where to go and how to handle specific situations and patient. So maybe it's a matter of time."*

The last aspect of resources is the *magic of medicine*. For many clerks the decision to study medicine and becoming a doctor was already made when they were young. This intrinsic motivation of a clerk acts as an important resource in withstanding the pressures of clerkship. Although the earlier mentioned lack of expectations can cause stressful feelings, the fact that now they walk around in a hospital, bringing factual knowledge in practice and are being educated to become future doctors hence contributing to patient care is an enormous positive motivation to bear the demanding side of clerkship (107,108,109,110).

108. *"Sometimes I get those little moments. It was around Christmas and I was late from clerkship, I walked near the patio where a choir was singing. The hospital was pretty empty and dark and there was a circle of light in that area and patients were moved towards that area. In one way or another it gave me a very special feeling."*
109. *"For me clerkships is a revelation. Not everything is always that great, but in the end I am certain that this is what I want to do."*
110. *"Although every clerkship I have to start all over again which is very energy draining, I still have the feeling of yes, this is it."*
111. *"It gives me a certain feeling of pride to walk around in that white coat."*

4.3.6 Overview of the counter-pressures of strain, resources

Doing a clerkship is demanding, but on the other side the clerk has multiple resources to handle and withstand the

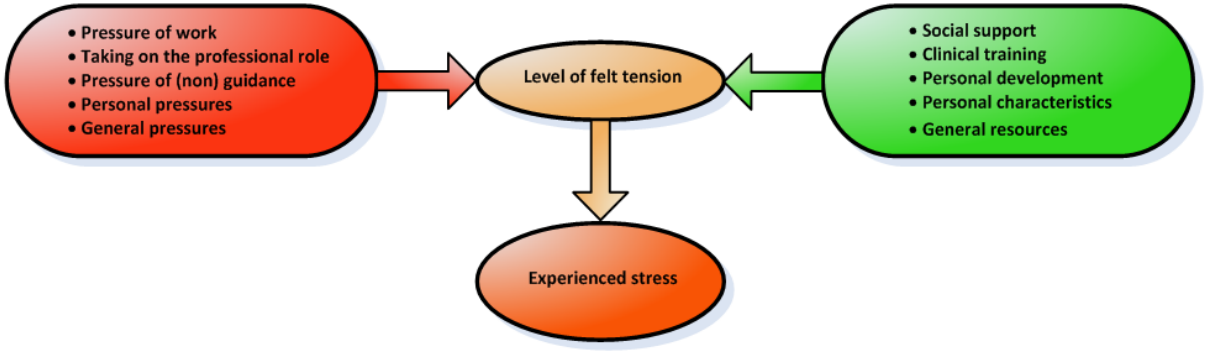
pressures of clerkship. These resources counterbalance the sources of strain so that it does not become intolerable demanding for a clerk doing clerkships. The overview of relevant resources is depicted in table 2.

4.4 Overview of demands, resources of clerkship

Making the transition from preclinical to clinical training is a demanding period. The first experiences with patients, doctors, expectations and the hospital in general can be potential sources of strain. The demands can be categorized into five main themes; pressure of work, pressure of taking on the professional role, pressure of (non) guidance, personal pressures en general pressures. As a counterbalance the clerk has multiple resources to withstand the pressures of clerkship. These can be divided into five categories; social support, organization of pre-clerkship, personal development, personal characteristics and general resources.

Social support	Clinical training	Personal development	Personal characteristics	General resources
Social support from co-clerks	Clinical training centre	Benchmarking	Communicating	Prior experience in hospital
Coaching groups		Learning to see in perspective	Enthusiasm	Temporariness of clerkship
Supervisory support			Assertiveness	Magic of medicine

Table 2 counter pressures of strain, resources.



Figuur 2 **Stress model, demands and resources of clerkship**

5 Discission

5.1 Main findings

This study describes the stress experienced by first year undergraduate medical students during their first weeks of clinical training at the UMCG and Martini Hospital in Groningen. The central research question was divided into two sub-questions. The first handled the experienced pressures and sources of strain and the other discussed the resources available to cope with the pressures clerks face.
The transition from preclinical to clinical training is a demanding period. Though not using the term stress, due to having a negative connotation, respondents mentioned many aspects they considered demanding. Hence, some stress was perceived as positive and lead to better performance, most stress was felt as negative. Negative stress causes cognitive overload which hampers clerk learning in patient care and will result in a decline of performance (Shapiro et al. 2000, Hell et al. 2008). Thus, being consumed with these new experiences causing feelings of pressure, less energy can be devoted to the real goal of clerkship; applying knowledge and developing the necessary competencies. This is underlined by the work of Shapiro et al. (2000).
The Job Demands-Resources model was never used in ths specific situation. The JD-R model proved useful and ultimately led to a detailed outcome of different pressures and counter pressures (see figure 2, p. 37). From the interviews it became clear that the respondents talked more about the factors that caused feelings of stress than reporting about various resources.
These research findings merit discussion. Using known literature and the main research results from this specific situation the themes are discussed.
What is underlined in this research is the well known fact that getting used to lengthy days and adjusting to a work rhythm are demanding *work pressures* (Karasek & Theorell, 1990). In the specific situation of transition to clinical training the factor of revising, studying and preparing in the evening is added as a work demand. Clerks can handle these work demands for a certain period of time, but, as Bakker et al. (2004) recognize, leaving them with no or little recovery time to replenish their energy this leads to high work pressures, resulting in stress. As a consequence the time available for a clerk being involved in social activities diminishes and becomes scarce. Prioritizing and time management are competencies that the clerk is assumed to attain at the start. Categorized as *general pressures*, trading the student life for a working life is something which a student isn't prepared for but is unmistakably a competency one has to get familiar with.
In the literature a frequently cited demanding factor is the interaction with patients (Sarikaya et al., 2006; Radcliffe & Hester, 2003). In the second demand theme "*learning to take on the professional role*" the aspect of interacting with patients is mentioned in various ways as a demanding factor. Noteworthy, however, are the aspects that are less frequently cited in literature. Not making a contribution to patient care due to lack of responsibility or due to lack of guidance was specifically mentioned. Why is it that once started clerkships, a future doctor is is feeling useless after years of training? It seems that this feeling is closely related to the expectations a clerk has. There is nothing more frustrating then having high expectations and being confronted with a reality which makes little of the expectations come true. Not knowing which tasks to perform or to what extent leads to ambiguity, is energy draining, thus costs psychological effort. This process is closely related to the Role Stress theory of Kahn et al. (1964) which states that role expectations or a lack of expectations from the sender, in this case the superior of the clerk, is yielding experienced pressure upon the individual.
That the transition is stressful and that learning on the job in actual patient care can be seen as evident, one might assume,

is recognized by the faculty of medicine. Therefore it is remarkable that students mention the guidance and information they receive, prior to clinical training, from medical school as insufficient and call this a demanding factor, categorized under the *pressures of (non) guidance*.
Being prepared for several years one might expect that there is a fundamental base of knowledge which the clerk can draw from. However, this is not what the clerk feels once starting clerkships. Having insufficient factual knowledge and not being able to handle basic instruments in good order, like the stethoscope, are sources of strain. This uncertainty can cause a clerk to a less open attitude, result in fear of failure and a decline of assertiveness. Thus, these *personal pressures* cause the clerk not exploring ones own borders and in doing so enhancing their own medical capabilities.
The short period of clerkships is an aspect more difficult to categorize as a pressure or counter pressure. After the initial starting period, in which one has to familiarize with new colleagues, patients, relevant knowledge, procedures and the newness of the situation the five weeks are quickly over and a new clerkship is waiting to start, thus the introduction process is repeated once again. Though the familiarizing period is associated with initial psychological costs, the temporariness of clerkships in itself is a counter pressure. Being aware that the stressful period is limited to five weeks, helps the clerk to accept and cope with the pressures faced. Hence, the enhanced skills and capabilities in the department could contribute to a diminished feeling of the feeling that one is not making a contribution to patient care.
Furthermore, from the faculty point of view the learning efficiency of clerks is of great importance. This raises the question whether the period of clerkship should remain as it is, or be extended in which the student has time to familiarize and can further use its energy to focus on enhancing medical skills, capabilities and optimally benefit the usage of the learning effect.
Looking at the necessary knowledge to make an actual contribution in the short time of presence in the department this raises an ethical question to what extent can the faculty or the superiors expect from a clerk to attain this department specific knowledge in such a short notice and make an actual contribution in patient care.

While the pressures that a clerk faces at the start of clerkship are the kind of sources of strain which have the ability to cause negative feelings of stress which can lead to negative outcomes, drop-outs do not that often occur. As the Job Demand-Resources model of Bakker et al. (2001) depicts, the counterbalancing resources keep the clerk from experiencing pressure overload and reducing the demands and associated psychological costs. Relevant resources are *social support, clinical training, general features, personal development and personal characteristics*.
While peer support and learning to see the situation more in perspective are valuable resources, it seems that one specific resource is that strong that it levels many of the pressures a clerks faces. Intrinsic motivation, depicted under the category of magic of medicine, seems strong enough to compensate many pressures. Why and how do clerks accept that remarks are disdainfully brought, are not allowed taking on responsibility and handle the pressures of work? Because practicing medicine, being a competent doctor and contributing to patient care is what they are intrinsically motivated by and practicing medicine is their ultimate future achievement. Hackman & Oldham (1990) and Schaufeli & Bakker (2004) recognize that this task significance can lead to experienced meaningfulness of work which causes a positive work-related state of mind that is characterized by vigour, dedication and absorption. The goal has been set very clearly in the beginning of their study, and once they get this far working and learning in an actual hospital setting, it's no option of pulling out. The demands are high, but the rewards, in the end, are worth the trouble at the start.

5.2 Forthcoming practical implications and recommendations

Reducing stress levels can positively influence the ability of a student to use their medical knowledge in clinical reasoning. Reducing stress levels can be achieved by reducing demand factors or increasing resource factors. Although this is aimed at gaining a more thorough understanding of the stress

factors that clerks face when making their entry in the clinical workplace, recommendations can be made to reduce experienced stress felt by students.
It is essential that clerkship student, who spends just five weeks in a clinical work setting, receive appropriate guidance to enable them to enhance their medical skills and learn optimally from the experience. Especially novices need guidance in their first steps in the workplace. Appropriate guidance, in the form of thorough communication between supervisor and clerk, can reduce demanding aspects as the felt insufficient factual knowledge, skills and task ambiguity. Furthermore the demanding aspect of revising and preparing in the evening could be done more specific. Hence, as a result of appropriate communication, the clerk knows what quality level is expected, can prepare for it and act on it with a positive attitude. Moreover, senior doctors could increase student resources such as enthusiasm and assertiveness by promoting an environment where stress is not specifically seen as something that is negative but rather as a fact that can be openly discussed and dealt with. Furthermore, the superior could enhance supervisory support by creating an environment that challenges and encourages the student to learn, ask questions and is free to express his or her feelings. More realistic expectations prior to clerkships can reduce stress aspects as not making a contribution and prevent the clerk of having feelings that working in patient care is not meeting their own expectations. Presentations prior to clerkship can be given by supervisors and clerks who have clerkship experience, hence a realistic view of what to expect and how to behave in a medical setting can reduce clerkship stress and increase resources such as communicating with other health professionals. At first supervisors should handle aspects that help students be more familiarized with relationships in the departments, understanding the roles of residents, nurses, and doctors and learning how students should behave and interact with them. Hence, the more experienced students should give tips and advice how to survive clerkships.

5.3 Strengths and Limitations

The use of a qualitative approach enabled to discuss and examine the unique situation of starting clerks. Through seven semi-structured interviews potentially sensitive aspects were discussed thoroughly and resulted in an extended list of demands and resources which may have not been found using a closed questionnaire. Respondents were free to discuss his or her feelings as well as emotions regarding the transition. Furthermore, interviewing clerks in the very beginning and ones somewhat further in the transition process resulted in a rich source of information with new experiences as well as more reflective remarks regarding the transition period.
This study has a number of limitations. Due to practical considerations as well as time restriction seven interviews were held. After interview six, saturation was reached on the level of themes of the demands and resources. Although in interview seven no new information came up, to get more detailed information on the subcategories of pressures and counter pressures more interviews need to be done.
Though in this research the concept of stress is defined, in the interviews no explicit quantified scale was used exploring the term stress. Thus every student is subjective in his or her description of anxiety and stressful experiences. Moreover, the participation in this research was voluntary in response to an e-mail. There is the possibility of bias whereas students who find the transition most stressful do ignore the e-mail and do not participate or explicitly do participate because they experience stress. However, an overarching concept and model of stress of the transition period has been achieved using an extensive range of views. Furthermore, undergraduate medical education consists of roughly the same elements in the whole of the Netherlands. Thus, although the interviewed students were all from medical education in Groningen, the results which mostly agree with the existing literature, enable these research findings to be generalized and be relevant for the transition period elsewhere in the Netherlands.

5.4 Recommendations for further research

This research gives an overview of the experienced stress and counter pressures of stress felt by clerks during a critical transition period in undergraduate medical education. However, to further contribute to the existing body of knowledge further research needs to be done. Firstly the focus should be on more in-depth interviews to create a more detailed picture of the subcategories of stress. Furthermore, quantitative research is needed to create a gradation of the relative importance of the pressures and counter pressures a clerk faces. Establishing a well funded theoretical method using quantitative research, further implications can be made to address the aspect of perceived stress that was indicated as most intense. Likewise, in depth analyzing of resource factors can result in a more focused emphasize and optimal usability of these counter pressures which can lead to a more bearable situation when a clerk is confronted with stressful events. Moreover, it would be interesting to analyze clerkships seen from a different perspective. What impact or contribution do clerks have on patient care and to what extent are they seen as helpful or seen as more of a burden for supervisors and the department as a whole. Furthermore, to what extend do patients accept being treated by clerks and to what level can a clerk be expected to treat a patient.
Hence, future research should determine and reduce perceived factors of stress which can lead to improved patient care and enhances skills and capabilities for future doctors.

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