

Caring for residents:

Exploring residents' well-being

Lenny Lases



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S.S. (Lenny) Lases

ISBN: 978-94-6332-241-6 / 978-94-6332-246-1

Cover design: Nedfinity

Layout: Nedfinity

Printed by: GVO drukkers & vormgevers B.V.

Financial support for printing this thesis was kindly provided by: Professional Performance onderzoeksgroep, Academisch Medisch Centrum Amsterdam, Zwols Wetenschapsfonds Isala (ZWIK), Vakgroep Chirurgie Isala, Chipsoft, MEDOX.nl B.V., Nedfinity.

The research reported in this thesis was financially supported by the Dutch Ministry of Health, Welfare and Sports and by the Royal Dutch Association of advancement in Medicine (KNMG). The copyright of articles that have been published has been transferred to the respective journals.

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Caring for residents: Exploring residents' well-being

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor

aan de Universiteit van Amsterdam

op gezag van de Rector Magnificus

prof. dr. ir. K.I.J. Maex

ten overstaan van een door het College voor Promoties ingestelde commissie,

in het openbaar te verdedigen in de Agnietenkapel

op dinsdag 31 oktober 2017, te 12.00 uur

door Seilenna Susanne Lases

geboren te Sandton, Zuid-Afrika

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CHAPTER 1

General Introduction

Medical Resident Burnout Reaches Epidemic Levels

Pauline Anderson

May 17, 2015



RESEARCH

Rates of medication errors among depressed and burnt out residents: prospective cohort study

Amy M Fahrenkopf, instructor of paediatrics,¹ Theodore C Sectish, associate professor of paediatrics,²

Physician wellness: a missing quality indicator

Jean E Walloce, Jane B Lemaire, William A Ghali

Lancet 2009; 374: 1714-21 **When physicians are unwell, the performance of health-care systems can be suboptimum.**

We know that modern working life challenges mental health and wellbeing in many professions.¹ The number and the content of articles in magazines and research journals show the extensiveness and impact of this problem all over the world. For health care workers, the problem of impaired well-being is also an increasing problem. Physicians experience high demands and stressⁱ of continuously delivering high quality patient care, working irregular hours, little autonomy and the increase in guidelines and administrative burden associated with practicing medicine. Shanafelt et al. report in a national study that 54.4% of physicians in the United States experience burnout symptoms and that this number is increasing.^{2,3} The Dutch numbers are not quite as high yet, but are also worrisome.^{4,5} The results from a review among residentsⁱⁱ show burnout rates varying from 18% to 82%.⁶ It is not just the increasing burnout rates that are worrisome; physicians also suffer more from depressions, emotional exhaustion, anxiety disorders, suicidal thoughts and even suicides.⁷⁻¹⁰ Also, vitality, work engagement and quality of life are all decreasing.^{3,10,11} For the individual physician – as for any worker – it is important to feel well, but physicians' well-being is also crucial for the quality of patient care delivery. Burnout in physicians is associated with suboptimal patient care and more self-reported errors.¹²⁻¹⁴ Among physicians, residents may be most vulnerable in their demanding work and learning environments.^{6,10,15,16} As it is crucial that residents as our future medical specialist workforce are well, this thesis will focus on different aspects of residents' well-being in relation to their residency training.

ⁱ There are two categories of stress: *distress* (negative stress) and *eustress* (positive stress). In this thesis we use the commonly used term 'stress' for indicating distress.

ⁱⁱ Other frequently used terms for residents: specialist trainees, medical trainees, junior doctors.

DEFINING WELL-BEING

1 When addressing well-being different terms are used. In 1948, the World Health Organisation (WHO) defined health as *'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'*.¹⁷ This definition included various domains and was innovative and progressive as it changed the former negative formulated definition of health as 'an absence of disease'. Over the past decades the WHO definition of health has been criticized.¹⁸⁻²¹ One point of criticism is that the definition unintentionally adds to medicalization of the community.¹⁹ A state of complete physical, mental and social well-being is given to only a few people and this makes that the rest is 'unhealthy' according to the WHO definition. Also, the nature of diseases has changed over time. Nowadays, most people will grow old with disabilities and according to the WHO definition a person with a chronic illness is definitively ill. From this perspective, the capacity of a person with a chronic illness to cope with challenges on a physical, emotional and social level and to function with a feeling of well-being is passed. To overcome the limitations of the WHO definition, Huber et al. proposed changing the definition towards the concept of health, as 'the ability to adapt and self manage in the face of social, physical, and emotional challenges'.²² In a mixed methods study the support for and opinions about this new definition of health were evaluated. The concept was found to be appreciated by representatives of seven healthcare stakeholders domains, especially as it accentuates that a person is more than his or her illness, focuses on persons' strengths and refers to self-management and individual responsibility.²³

The in 2011 introduced new concept of health,²² is recently further researched and Huber et al. explicated the perceived indicators of health.²³ These health indicators cover 32 aspects of health and are arranged in six dimensions: bodily functions, mental functions and perceptions, spiritual/existential dimension, quality of life, social and societal participation, daily functioning. Figure 1 shows an instrument based on these six dimensions on a scale indicating an estimation of the experienced

health status of a person. As this figure illustrates, the by Huber presented health indicators include a wide area of health. This differs from most other subjective health measurements.

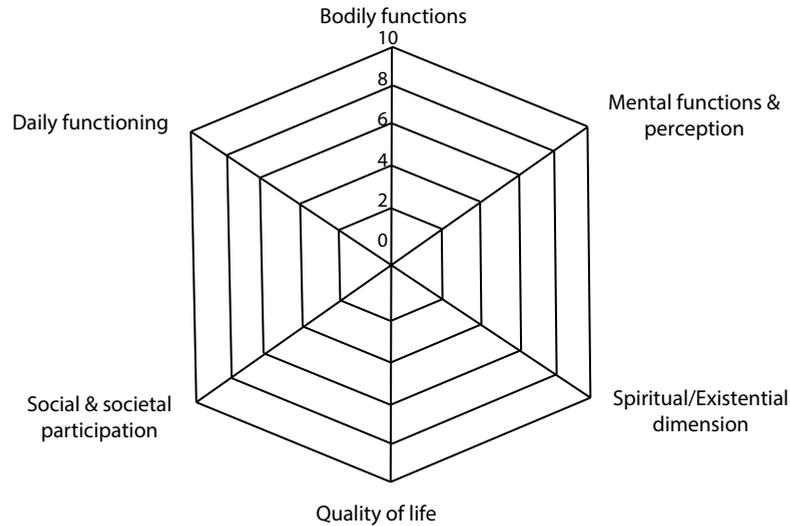


Figure 1. The six dimensions of health as proposed by Huber et al.²³

Although this new definition of health is nowadays often used, it is not supported by everyone. The WHO is using her own definition and additionally there are still various terms and descriptions of health circulating in literature and the population. Wallace for example writes about wellness and describes it as the 'complex and multifaceted nature of physical, mental and emotional health and well-being'.¹⁰ Wallace and Shanafelt make also note that wellness 'goes beyond merely the absence of distress and includes being challenged, thriving and achieving success in various aspects of personal and professional life'.^{10,24} Additionally, the term well-being is often used in literature for describing the same subject. These different terms of wellness and well-being are also in this thesis interchangeably used.

WELL-BEING UNDER PRESSURE

1 Nowadays, well-being seems to be under pressure. Over the past decades, we noticed an increase in impaired well-being in our society, possibly a consequence of the rapid changing societies we live in. Underlying developments of these changing societies are informatization, globalization and individualization.^{25,26} Prominent in this transformation are the rapid digital technology changes that continuously transpire. Immediate and rapid communication through messaging and email has become the standard and social networking sites as Facebook, LinkedIn and Twitter are barely possible to avoid. All kinds of information on a personal and professional level are accessible on the internet for anyone. This opens up new dimensions of productivity and information gathering but also demands new forms of knowledge. The ongoing transformation of these communication and information options extends the reach to all domains of professional and social life and we are no longer dependent of time and place. This could result in expectations and requirements of instant reactions, updates and for example revealing performance data. The digital changes have also induced a new form of communication, mass-self communication over the internet and wireless communication networks. Most messages and blogs are of personal character. To some extent it looks like that this form of mass self-communication has increasingly less to do with actual communication. Additionally, there is an individualization of life patterns and the self-centering of culture.²⁷ The challenge in this rapid changing society is not to become overwhelmed, over-reactive, or too individualistic as this could impair well-being.

Other explanations about experiencing distress and impaired well-being may be found in the imbalance between the 'life world' and the 'system world'. Habermas, a modern German philosopher, describes the theory about the life world and system.^{28,29} He distinguishes between the political-economic system and the communication-directed life world. The term system has its origin in sociology and the social system theory. An example of the system is the economic system or the state bureaucracy. Within a system 'instrumental rationality' with goal-directed

acting is dominant. In contrast, within the life world the communicative rationality is leading and the 'life world is based on communication, agreement and consensus'.²⁹ The by Habermas used term life world comes from the phenomenology of Edmund Husserl and Alfred Schutz and is the collection of cultural ideas that continuously play a role at the background. Habermas describes that the life world is the most essential and made the breakthrough of the system possible. According to Habermas we now have reached the point that the system breaks free from the life world and starts to dominate her. This leads to problems in society. The economic and administrative system is intruding the life world,³⁰ and therefore Habermas speaks of 'colonization of the life world'.^{28,29}

Within the medical world, the life world includes the world as we experience it, the patient care that we deliver, communication with the people we meet and feeling responsible. The system is the world that must support the activities in this life world. The system world is characterized by aspects as protocols, guidelines and performance indicators. A problem is the incongruence between these two worlds. Barry et al. describe this incongruence and the importance of the life world in the doctor-patient relation.³⁰ Experienced distress comes for example from the feeling of excessive external control and rationalization with protocols, bureaucracy and administrative burdens. This results in less space for authentic and professional practice, autonomy and intrinsic motivation.³¹

PHYSICIANS' WELL-BEING

The above described current challenges of being well are obvious and worrisome. Unsurprisingly, well-being has become a central issue in medical practice and policymaking as well. Fortunately, many physicians experience their work as fulfilling and meaningful and are passionate about and satisfied with their job.³²⁻³⁴ Having a positive influence on patients and successful patient outcomes are perceived as the most energizing parts of their work.³² However, dealing with the many job demands,

including consistently delivering high quality patient care, working irregular hours, little autonomy, the increased accountability, growing bureaucracy and maintaining a good work-life balance, appears to be one of the greatest challenges for medical professionals.^{6,16,35,36} Physicians feel overwhelmed by the numerous guidelines they need to comply with and experience a decline in autonomy.³⁷⁻³⁹ Additionally, physicians suffer more from emotional exhaustion, a sense of reduced personal accomplishment, depressions and suicidal thoughts.^{3,7,8,40} This appears to result in more physician job dissatisfaction and perceived work stress. The inability to react and cope successfully with the experienced demands may lead to impaired well-being with negative personal and professional consequences.^{4,10,13,41}

Indicators of well-being

Burnout and work engagement

The most discussed well-being construct is probably burnout. Burnout could be seen as 'the prolonged response to chronic emotional and interpersonal stressors on the job defined by three dimensions: emotional exhaustion, depersonalization and reduced personal accomplishment.'⁴² Causes of burnout are in particular related to work related aspects.⁶ Maslach et al. found that factors as work-related role problems, work overload and deficiencies in job resources (e.g. lack of social support or autonomy) were contributing to burnout.⁴² Emotionally demanding interactions with patients and confrontations with illness and death are also associated with burnout.⁴³ Burnout has significant effects on the individuals' well-being, their professionalism, their performance and the viability of health-care systems.^{10,40,42,44,45} Burnout is for instance associated with reduced quality of patient care, loss of productivity, intention to leave the job and withdrawal.^{13,42 6,42}

As we are also interested in the positive side of being well, including the positive consequences, we will mainly focus in this thesis on work engagement, which

could be seen as the opposite of burnout. Work engagement has namely shown to positively affect work performance in various professions.⁴⁶ Additionally, we know that amplifying strong points or energy givers is more effective for performance than reducing job demands and focus solely on preventing burnout.^{47,48} Work engagement is often defined as 'a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication and absorption'.⁴⁹ Vigor is characterized by high levels of energy and mental resilience. Dedication involves experiencing a sense of significance, enthusiasm and challenge and being strongly involved in one's work. Absorption refers to being fully concentrated and absorbed by work.^{49,50} Research in the medical context also showed that work engaged physicians appears to positively influence their professional performance.^{13,51-53} Work engagement is associated with more adequate patient safety behaviors and fewer medical errors.^{13,51} Additionally, research suggests that work engagement has a potential for enhancing work ability.^{53,54}

Work Satisfaction

Physicians' satisfaction can also be considered an important work-related well-being indicator. Increases in physicians' dissatisfaction is associated with higher levels of burnout and mental health problems.^{55,56} Research findings suggest that job dissatisfaction is the short-term result of experiencing job stress and is negatively related to turnover.⁵⁶ Factors as autonomy, income and job demands seems to be predictors for physicians' satisfaction.⁵⁷ Additionally, having contact with, interacting with or caring for patients was found to contribute to work satisfaction of physicians.³² Physicians' work satisfaction is also important for patient care. Dissatisfied physicians seems to have a riskier prescribing profile, make more errors and deliver more suboptimal patient care.^{56,58} In this thesis we use the global job satisfaction and specialty satisfaction scale from the Physician Worklife Study to measure physician satisfaction.^{59,60}

Empathy

1 A problematic and in our view serious consequence of distress and a lack of well-being is the loss of empathy. Physician empathy is a multidimensional concept involving cognitive and affective dimensions. It could be seen as 'the physicians' understanding of the patient and the verbal and non-verbal communication of the physician resulting in a helpful therapeutic option.'⁶¹ Hojat et al. describe that empathy consists of the following components: perspective taking, compassionate care and standing in patients shoes.^{62,63} Physician empathy has found to be important for the quality of patient care. Physicians' empathic behavior leads to more compliant and satisfied patient, less depression and better quality of life.⁶⁴⁻⁶⁸ Additionally, decreased physicians' empathy is associated with making more errors.⁶⁹ Unfortunately, there is reported an empathy decline among medical students and residents. One explanation is that a decrease in empathy could be seen as a consequence or an expression of distress or burnout.^{64,65} To measure empathy in this thesis, we used the Jefferson Scale of Physician Empathy (JSPE).^{62,70,71}

In conclusion, physicians' well-being is crucial for the individual physician and can also be seen as a quality indicator for the health care system; it is therefore important to conserve and where possible enhance.¹⁰ Residents experience of their well-being and the relation to their professional activities and conditions is relatively unknown. In this thesis we try to reduce these gaps by exploring residents well-being experiences and the above described and in our view most relevant physician well-being characteristics that potential affect quality of care: work engagement, work satisfaction and physician empathy.

Theoretical model underpinning this thesis

A frequently used evidence-based model to describe the association of different work characteristics with well-being and performance is the Job Demands and

Resources model (JD-R model).⁷² This model focuses on both negative and positive work-related well-being, burnout and work-engagement, and categorizes the predictors in two groups: job demands and job resources.^{50,72} According to Bakker et al, a job demand refers to 'a psychological, social or organizational aspect of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills and are therefore associated with certain physiological and/or psychological costs'. Job demands are not necessarily negative for the work-related well-being of employees. However, these could turn into job stressors when they require high effort and the employee has not the opportunity to restore adequately.⁷² A job resource refers to 'a physical, social or organizational aspect of the job that reduces job demands, is functional in achieving work goals, or stimulate personal growth, learning and development'. Job resources seem valuable in itself given the motivational potential they could have. Examples of these job resources are autonomy, feedback and task significance.^{48,72,73} Job demands and resources may be located at different levels. As described by Bakker et al. we can think of the following levels:

- Organization at large (e.g. career opportunities, salary)
- Organization of work (e.g. role clarity, participating in decision making)
- Relations (e.g. team climate, supervisor support, peer support)
- Task (autonomy, performance feedback, skill variety, task significance)

The Job Demands and Resources model posits that two different underlying psychological processes play a crucial role.^{35,72} The first process is the health impairment process, where high (chronic) job demands in combination with little job resources increase strain and fatigue, leading to *health problems and burnout* and ultimately resulting in negative organizational outcomes.^{72,74} The second process is the motivational process, where job resources have a motivational potential and

could lead to high work-engagement and better performance.^{47,74} Figure 2a shows the Job Demands and Resources model.

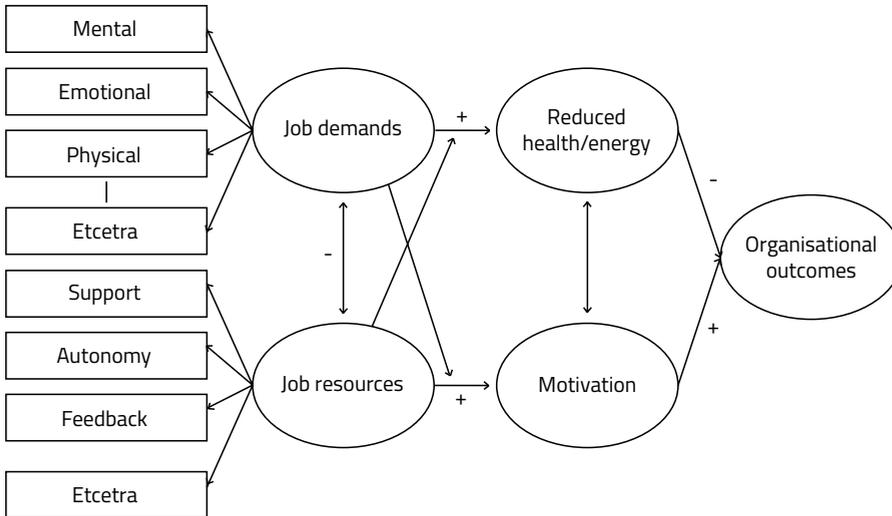


Figure 2a. Job Demands and Resources Model.⁷²

Xanthopoulou et al. evaluated the role of personal resources in the JD-R model. Personal resources are 'characteristics of a person that are generally linked to resiliency and refer to individuals' perception of their ability to control and have impact on their environment successfully.'^{75,76} The personal resources, i.e. self-efficacy, organizational-based self-esteem and optimism, were found to mediate the relationship between job resources and work engagement/exhaustion and additionally showed to influence the perception of job resources.⁷⁵ In particular, personal resources have shown a negative relation with exhaustion. This suggests that optimistic or efficacious employees experience lower levels of fatigue and could better deal with unfavorable conditions.^{75,77} A positive relation was found with work-engagement. Additionally, the supply of job resources has shown to enhance employees' self-efficacy, self-esteem and optimism and the felt capability of controlling their work environment.⁷⁵ The impact of personal resources on the motivation and health impairment process and thereby on work-related well-being could be added to the JD-R model (Figure 2b).

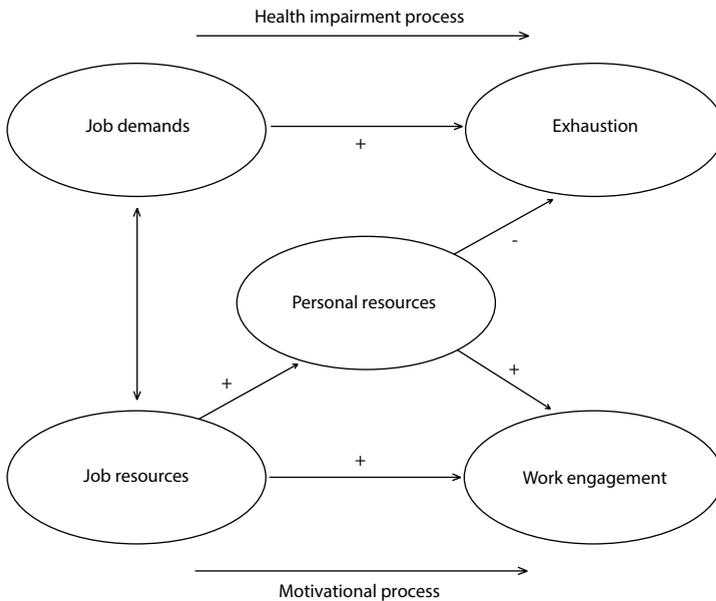


Figure 2b. The extended Job Demands and Resources Model.⁷⁵

Whether and which job resources, personal resources and job demands could be targeted to enhance well-being is relatively unknown for physicians and residents. In this thesis, we use the Job Demands and Resources model to research and elucidate residents' work-related well-being and the predictors on different levels.

RESIDENTS IN THEIR PROFESSIONAL LIFE

Residency training

This thesis focusses on residents. In short, residents are medical doctors in training to become medical specialists. After graduation from secondary school the scholar first becomes a medical student and follows a bachelor and a master program to become a doctor. During the bachelor phase medical students mainly gain theoretical knowledge in non-clinical educational settings; in de master phase they are introduced in clinical practice through specialty-based internships in a

hospital and a research project. After finishing this medical school, they graduate as a Medical Doctor (MD) or may call themselves physician. After graduating they are able to start with a training to become a medical specialist, called residency training or post-graduate medical education. The duration of residency training to become a specialist varies between three to six years.

The training of residents has traditionally been based on the apprenticeship model, where a trainee – an apprentice – is learning from his (one) master. This model has transformed and nowadays there are multiple masters – faculty – training one trainee. Additionally, the content of the curriculum has recently shifted from content-based to the competency-based training model with the aim of ensuring high quality training for residents. All over the world, this shift was implemented, resulting in various models for defining competencies. For example the competencies described by the American Accreditation Council for Graduate Medical Education (ACGME), the British Graduate Medical Council's (documented in "Tomorrow's doctors") and the Canadian Medical Education Directions for Specialists (CanMEDS).⁷⁸⁻⁸⁰ In the Netherlands, the latter framework, CanMEDS, has been adopted for training residents. This framework refers to the specific knowledge, skills and abilities that are expected from residents defined in seven professional roles: the medical expert, communicator, collaborator, leader, health advocate, scholar and professional.⁸⁰ Figure 3 shows the CanMEDS diagram that illustrates the 7 CanMEDS roles and their interconnections. The aim is to create an optimal residency training with high quality education that delivers physicians with high professional performance who fit the needs of modern medicine.⁸¹



Figure 3. CanMEDS diagram with the seven CanMEDS roles and their interconnections.⁸⁰

During residency training, residents work as doctors, learners and as teachers. After graduating, doctors have the responsibility and duty of delivering optimal patient care, practicing life long learning and being involved in knowledge transfer to future colleagues. Residents are educated, trained and supervised by specialists in knowledge, skills and attitudes. At the same time residents train medical students adjusted to their phase of training.^{82,83} The medical context, and especially that of the residents, is potentially risky for impaired well-being as it is quantitatively and qualitatively demanding.^{6,16} These demands range from the continuously changing professional and educational standards, the interaction with patients, working irregular hours, the exposure to death, suffering or complex situations, to the dependency of supervisors.

Residents & faculty

According to modern standards for residency training, systematic and continuous attention for the quality of various aspects of residency training is required from all stakeholders. In order to make evaluating, discussing and improving these training aspects possible various evaluation systems have been developed over the past decade. The research group Professional Performance from the Academic Medical Center in Amsterdam has been one of the leaders in this field in the Netherlands. Well-researched tools are now available to measure for example individual teaching performance of faculty (SETQ),⁸⁴⁻⁸⁶ the learning climate (DIRECT),^{87,88} teamwork among supervisors (TeamQ),⁸⁹ and individual clinical performance of medical specialists (INCEPT).⁹⁰

Clearly, for residents the individual teaching performance of their faculty is crucial for their daily work and learning experience, as well as for their training and patient care outcomes. Educating and supervising residents is the responsibility of all attending faculty who work at the residency training department. Each residency training program is managed by a formal program director, but all faculty are expected to provide high quality of competency-based training. This includes providing constructive feedback, creating a safe learning climate and acting as a role model.⁸⁰ Carmeli et al. describe the value and importance of high-quality interpersonal relationships in the workplace.⁹¹ These high-quality relationships are associated with experienced psychological safety. Additionally there seems to be a relation with better learning behaviors. In relation to the well-being of residents, the learning qualities and professional attitudes of faculty seem to be important. Residents may experience that they are treated unfairly or not equal compared to peer residents. Experiencing inequity or unfairness could lead to negative emotions with a higher risk of burnout. Several studies show that social support of supervisors is important. Experiencing good social support could positively influence well-being and job satisfaction, while the lack of social support affects stress symptoms and burnout.^{92,93}

As teaching performance of faculty is presumed to be that crucial for high quality residency training, instruments are developed for evaluating teaching performance. One widely used and researched evaluation system is the System for Evaluation of Teaching Qualities (SETQ).^{84-86,94,95} The SETQ instrument consists of 20 core items on the following 5 teaching domains: learning climate, professional attitudes towards residents, communication of learning goals, evaluation of residents and feedback to residents.

The SETQ system is developed to evaluate, provide feedback on, and possibly improve the teaching performance of faculty.

Residents & learning climate

Learning climate in residency training contains the formal and informal aspects of education,⁹⁶ and is identified to be crucial for the quality of residency training.⁹⁷⁻⁹⁹ The learning climate can be measured with the widely used and well-researched questionnaire Dutch Residency Climate Test (D-RECT).^{87,88} This instrument is the most used tool for evaluating the learning climate of residency training programs in the Netherlands. The last-updated D-RECT instrument will be used in this thesis and contains 35 items and 9 learning climate domains: educational atmosphere, teamwork, role of specialty tutor, coaching and assessment, formal education, resident peer collaboration, word adapted to residents' competence, accessibility of supervisors and patient sign out.

Besides the importance for the quality of residency training, research suggest that a good and safe learning climate is associated with better learning behaviors and higher residents' work-related well-being. The learning climate is found to be positively associated with residents' quality of life and satisfaction with work-life balance.¹¹ Negative associations of the climate of learning are shown with burnout symptoms in residents and with medication errors.^{11,100} What the relation is between

the residents' learning climate with its distinct domains and a broader set of well-being characteristics is relatively unknown and is investigated in this thesis.

PHYSICIANS' PROFESSIONAL PERFORMANCE

1 Professional performance of physicians is complex, it refers to both functioning and achieving, process and outcome.¹⁰¹ It can be defined as 'all the actions or processes in performing work tasks, whilst adhering to the values and behaviors of the profession'.¹⁰² By pledging to the Hippocratic oath, physicians commit to the values and behaviors of the medical profession.^{103,104}

The health care system in the Netherlands is considered one of the best in the world,¹⁰⁵ and the estimated prevalence of poor physician performance in the Netherlands is approximately 5%.¹⁰⁶ Public trust in physicians is increasingly challenged,^{107,108} and physicians' professional performance is seen as crucial in improving patient care.^{10,109,110} The key to high professional performance is striving for excellence, humanistic practice and showing accountability for ones actions.¹⁰¹ Residents are continuously supervised and educated by their faculty. Additionally, their knowledge and skills are being tested and rated using the previous described CanMEDS framework.⁸⁰ The aim is to create optimal residency training with high quality education, producing high performing physicians who fit the needs of modern society. Residents are out to deliver optimal patient care to their level of medical expertise. The results of a review study from van der Leeuw et al. show that residents, if well supervised and given sufficient time, are able to deliver patient care from the same quality as specialists.¹¹¹

One of the most important contributors to high professional performance of physicians seems to be physicians' well-being.^{10,14} Wallace describes physicians' well-being as crucial and 'an indicator of organizations' quality of health care'. In this thesis, we will focus on physicians' well-being, more specifically on residents' well-being.

AIM OF THIS THESIS

This introduction shows the importance of residents' well-being and the need to research the well-being of residents further. The overall aim of this thesis is to evaluate, clarify and possibly improve the work-related well-being of residents in training. We will study this in the following six chapters of this thesis.

As described in the introduction, physician well-being is recently more addressed and different constructs and indicators for work-related well-being are described and evaluated. We developed our concerns about the work-related well-being of residents. In [Chapter 2](#) we will describe these informed **concerns about residents' well-being and possible strategies for a solution** based on national and international literature.

After describing our literature-based and personal concerns about residents' well-being, some demands facing them and the resources available to residents to deal with these, we will proceed with studying how Dutch residents experience well-being. In [Chapter 3](#), we will explore in an interview study **how residents experience their own well-being in relation to their professional life**. In this study residents will describe their experienced well-being and influencing factors.

When considering residents' work-related well-being, multiple characteristics have been addressed. In the next chapter we will evaluate two, in our view, serious and relevant work-related well-being characteristics that potentially affect the quality of care: residents' work engagement and empathy scores. We additionally think that these residents' well-being characteristics might influence residents' evaluations of faculty's performance. As faculty's teaching performance is important for the quality of residency training and for the quality of patient care, it is crucial to be adequately measured. Therefore, in [Chapter 4](#), we will report the results related

to the research question: **What are the levels of work engagement and empathy among residents and what are the associations of both with their evaluations of faculty's teaching performance?**

1

We know that work engagement is associated with better patient care. In [Chapter 5](#), we will study whether patients experience better patient care delivery in physicians with higher levels of work engagement. We will additionally investigate whether the job resources autonomy, colleague support, participation in decision-making and opportunity to learn and develop are positively related to work engagement. The following question is addressed: **How is physician work engagement associated with patient care experience and with physician job resources?**

When having explored different job resources and the influence on work engagement we continued our exploration by evaluating whether the learning climate of residency training could be seen as a job resource and is influencing residents' work engagement. In addition to the residents well-being experiences in chapter 3 we are also curious about the influence of the learning climate on residents' work satisfaction and empathy. In [Chapter 6](#), we will therefore study whether **higher rated learning climate is positively associated with residents' work engagement, work satisfaction and empathy.**

The following chapter will evaluate a possible intervention for improving work-related well-being: Mind Fitness Training. We were curious about how residents perceive such a training based on the concepts of mindfulness. In this [Chapter 7](#) we will investigate the research questions: **What is the influence of a Mind Fitness Training program on work engagement, empathy, work satisfaction and stress perception? How do surgery residents experience a Mind Fitness Training?**

In the last chapter, Chapter 8, we will discuss the main findings of our studies. We will place these findings on residents' work-related well-being in context, describe the strengths and limitations of the studies, and we will conclude with implications and recommendations.

To answer the above research questions, different research designs and methods, including quantitative and qualitative approaches, were used. Table 1 gives an overview of the studies performed and described in the following chapters of this thesis (table 1).

Table 1. Chapters of this thesis and their research questions, study design and analytical approach

Chapter	Research question(s)	Study design	Analytical approach
2	What are the concerns of residents' mental well-being?	Perspective	Literature appraisal & personal perspective
3	How do residents experience their own well-being in relation to their professional life?	Resident interviews	Phenomenology; thematic network analyses
4	What are the levels of residents' work engagement and empathy and the associations of both with their evaluations of faculty's teaching performance?	Resident surveys	Linear regression analyses
5	How is physician work engagement associated with patient care experience and with physician job resources?	Patient and physician surveys	Linear regression analyses
6	Is higher rated learning climate positively associated with residents' work engagement, work satisfaction and empathy?	Resident surveys	Linear regression analyses
7	What is the influence of a Mind Fitness Training program on engagement, empathy, work satisfaction and stress perception? How do surgery residents experience a Mind Fitness Training?	Resident surveys and interviews	Growth models, linear regression analyses and template analyses

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CHAPTER 2

Concerns about residents' mental fitness: two possible strategies for a solution

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ABSTRACT

2 A good level of physical and mental fitness is essential in order to function optimally as a resident. Concerns about residents' mental fitness have recently been raised, based on high percentages of residents suffering from burnout and depression and data on the experience of stress and anxiety. Lack of mental fitness has negative consequences for the individual doctor as well as for the quality of patient care delivered. This is expressed in loss of empathy, delivery of suboptimal care and increased medical errors. Finding solutions for the lack of, or deterioration in, mental fitness is crucial. We discuss two potential strategies: (1) the removal or reduction of obstacles to residents' mental fitness and (2) the provision of resources to improve mental fitness.

INTRODUCTION

A recent Dutch study showed that signs of burnout were found in 20% of the residents.¹ This is not a uniquely Dutch problem, as international studies report even higher percentages.² Having a burnout can lead to poorer performance and can cause residents to stop working.² The fact that an average of 10% of the residents discontinue their training stresses the possible extent of the problem.³ Ending a medical specialty training leads to a laborious and time-consuming process for the resident concerned and for the educator and also has significant financial implications for society: educating a resident costs the Dutch government approximately € 140,000 per year.⁴

Nowadays a hospital is a complicated and dynamic working and training environment for residents. This is partly due to the increasing complexity of health care organizations and systems, more assertive patients, an increasingly critical public and the recent modernization of postgraduate medical education. These developments create a difficult position for residents who want to deliver the best possible patient care and also to optimize the completion of their training. In 2010, a report of the inspectorate of labor revealed that residents experienced a heavy workload and that the maximum number of working hours per week is often exceeded.⁵

We want to draw attention to the current concerns about the lack of mental fitness among residents and the possible consequences. We also present two potential strategies for a solution.

MENTAL FITNESS

Residents are in training to become medical specialists and at the same time they provide a large part of daily patient care. A recent review found that residents, if properly supervised, can provide safe care of the same quality as specialists.⁶ To be able to function optimally, it is very important for residents to have a good physical as well as mental fitness. 'Mental fitness' is described as a major component of the overall fitness of a doctor.⁷ We use 'mental fitness' here in the sense of 'a state of well-being in which the individual can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community'; this definition is based on the definition of WHO.⁸ It is in particular the mental fitness of residents, our future medical specialists, that has given rise to concerns in recent years.

Concerns about mental fitness of residents

Lack of mental fitness of residents is becoming more noticeable.⁷ Examples of this are the high percentage of residents with depressive symptoms (20%),^{9,10} and the percentage of residents who experience stress and anxiety (34% and 27%, respectively).^{9,11} These negative mental states contribute to a higher risk of making medical errors and the provision of sub-optimal care.^{7,10,12,13} Another, and possibly the most noticeable, problem is the high incidence of burn-out among residents.^{1,2,10}

Burnout Burnout can be defined as a prolonged response to stressors on the job characterized by emotional exhaustion, depersonalization, and a diminished sense of personal accomplishment.² Research suggests that approximately 20% of Dutch residents report symptoms of burnout.¹ This means that the prevalence of burnout among residents is twice as high as in the general Dutch working population.^{1,2} Important factors in developing burnout seem to be the combination of high work and training demands and the interference between tasks at work and at home.²

The risk of a burnout seems to be increased by the characteristics of a good doctor: those who are the most susceptible are the most involved, conscientious and responsible healthcare professionals.¹⁴

Suffering from burnout has a negative impact on the individual learning process and on the quality and quantity of patient care.^{2,7,12,13,15} Doctors themselves hardly ever consult a doctor and they very rarely call in sick.⁷ This often leads to presenteeism: being present at work while unable to perform optimally. Eighty percent of physicians have indicated that they have occasionally worked when they were actually too sick to do so.⁷ A Dutch study found that residents with symptoms of burnout reported making more medical errors than residents without symptoms of burnout.¹⁵ Similar results were found in research among American residents.¹²

Loss of empathy A problematic and in our view serious consequence of burnout is the loss of empathy. Empathy is defined as the ability of a doctor to understand patients' experiences and feelings, combined with the capability to communicate this understanding and an intention to help and respond to the patients' situation in a helpful, therapeutic manner.¹⁶ Doctors who suffer from burnout seem to be less able to listen empathically and they tend to keep patients at a distance.^{16,17} A recent review suggests that early in their training, many physicians lose much of their empathic capacity instead of becoming more empathic.¹⁶ Well-developed empathy in a physician has positive effects on patient care, such as better therapy compliance, improved quality of life and greater satisfaction with the doctor.^{16,17} Reduced empathy in a doctor, on the other hand, can impede the quality of care; it manifests itself in an inferior doctor-patient relationship and more medical mistakes.^{12,16,17}

Loss of empathy can be seen as a consequence or manifestation of burnout and can be caused by residents' negative coping mechanism regarding stressful situations and responsibilities. Residents who become less empathic often concentrate more on the problem than on the patient in stressful situations, which causes the distance between doctor and patient to remain big. This way of dealing with stress

may result from and is reinforced by the fact that residents often work more or less alone and are afraid to make mistakes.¹⁶

Viewed from this perspective, a lack of mental fitness in residents is bound to harm both the residents themselves and the quality of patient care they deliver.

2 TWO STRATEGIES FOR A SOLUTION

To improve the quality of care and to warrant optimal functioning of residents, solutions must be sought for the declining mental fitness among residents. Two strategies are conceivable: the prevention of a further decrease in mental fitness, or investing in the increase of mental fitness. This is more than just a semantic difference.

These two strategies are consistent with the theory that divides explanatory factors of burnout and of organizational outcomes, such as job performance and job satisfaction, into two general categories.^{18,19} These categories are the so-called 'job demands', the aspects of the job that require sustained physical or mental effort, and the so-called 'job resources', the work factors that stimulate personal growth and development. In this theory, the term 'job demands' refers to all the aspects of work that require constant physical or mental effort; these are physical as well as psychological, social and organizational aspects. The 'resources' are all the aspects of work that contribute to the achievement of work-related goals, reduce job demands and encourage personal development. Having too many job demands and too few job resources has been shown to be predictive for the development of stress and burnout and for negative organizational outcomes, while a good balance between the two can result in work engagement and positive organizational outcomes.¹⁹

Preventing the decline of mental fitness. The first solution strategy is the prevention of a further decline in the mental fitness of residents. This can be achieved by reducing the job demands. Particularly stressful job demands reported by doctors

are working in shifts, a perceived high workload, dealing with demanding patients and delivering bad news to patients.^{2,7} Some job demands, such as a high workload and doing night shifts, for example, could be reduced by a change in the division of labor. At present, a reallocation of tasks is implemented in multiple specialties, allowing routine medical procedures that so far have been performed by doctors to be carried out by other specially trained professionals (source: www.knmg.nl/taakherschikking). Furthermore, it seems that an appropriate specialty choice, i.e. choosing a specialty that suits one's preferences and capabilities, plays a role in the perception of job demands and the ability to deal with them. It is therefore important that medical students are already well informed about the content of various specialties during graduate medical training. A previous study has already suggested the option of implementing a so-called transition year to facilitate that final year medical students are better prepared for postgraduate medical education.²⁰ Other job demands, such as dealing with demanding patients and communicating bad news to patients, will always remain part of a residents' job. These job demands may possibly be alleviated by proper supervision and by giving residents more time and space to develop themselves.

Enhancing mental fitness. The second strategy is to invest in increasing the mental fitness of residents. Research has shown that having sufficient 'resources' may buffer the negative impact of high job demands on the perceived level of work stress.²¹ If an organization offers sufficient resources, employees are better motivated, more committed to their work, and more inclined to help colleagues. People who are energetic and dedicated and are absorbed in their work, the so-called work-engaged people, have a positive attitude regarding their work, can manage a lot of work and perform better.¹⁹ The importance of work engagement for the quality of care is also evident from the finding that engaged residents make fewer medical mistakes than residents who are not or less engaged.¹⁵ Examples of important resources that can help increase the mental fitness and work engagement of residents include proper supervision, the feeling of being supported in their work, peer reflection groups and receiving meaningful feedback on skills and professional

conduct.^{19,22} New resources, such as attending a mindfulness training and regular physical exercise, seem to be increasingly utilized.^{23,24} These resources have positive effects on mental fitness and can contribute to increased work engagement.^{19,24,25} This makes it plausible that training in mental fitness, for example in the form of mindfulness, can make a positive contribution to the training of residents. An exploratory study on the effects of mental fitness training for surgery residents has recently been launched in two Dutch hospitals: the University Medical Center in Groningen, and the Isala clinics, a large non-academic teaching hospital in Zwolle.

2

CONCLUSION

Maintaining and improving the mental fitness of residents will not only have positive effects on residents themselves but also on the quality of care. We therefore think that it is important to pay attention to the mental fitness of residents and to improve their mental fitness when needed or possible. The two possible strategies discussed in this paper are eliminating job demands that reduce mental fitness and introducing job resources to promote mental fitness. If certain job demands cannot be eliminated, job resources may help to alleviate the negative effects of these job demands. It is important to bring this to the attention of program directors and supervisors, hospital-wide residency training committees, and hospital management. Future research will have to determine which job resources are most effective.

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CHAPTER 3

Efforts, rewards and professional autonomy determine residents' experienced well-being

3

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ABSTRACT

Background Since physician well-being is beneficial to the individual physician and the quality of patient care the authors further explored how residents experience their own well-being in relation to their professional life.

Methods The authors conducted a qualitative study using a phenomenological approach. From June to October 2013, 13 in-depth interviews were conducted with residents in various training programs using a semi-structured interview guide to explore participants' experience of their well-being in relation to their professional life. The data was collected and analyzed through an iterative process using the thematic network approach.

Results Residents' experiences could be assorted in main themes influencing well-being: patient care, teamwork, workplace-learning, organizational aspects, self-knowledge and work-life balance. The way they felt experiences in these (often combined) themes and the duration influenced their experienced well-being. Effort-reward balance and autonomy were dominant overarching experiences in influencing residents' well-being. Experiencing sufficient autonomy was important in residents' role as caregiver, as learner and in their private life. The experienced effort-reward balance could both positively and negatively influence well-being.

Conclusion In residents' well-being experiences, effort-reward balance and autonomy were found to play a dominant role. These could be key-factors for interventions and residency training adaptations for enhancing residents' well-being.

INTRODUCTION

Physician well-being is crucial in health care as well-being is not only beneficial to the individual physician but also is a condition for delivering high quality patient care.¹ Physicians who report higher levels of well-being make less medical errors and achieve higher patient satisfaction levels.²⁻⁴ Multiple terms and constructs are used to describe well-being. Wallace uses the term wellness and describes this as “the complex and multifaceted nature of physicians’ physical, mental and emotional health and wellbeing”.¹ He also captures the positive side of being well and includes being challenged, thriving, and achieving success in various aspects of personal and professional life. Residents’ experience of their well-being and its influencing factors is relatively unknown and therefore useful and important to explore further.

Many physicians are passionate about and satisfied with their job and experience their work as very fulfilling and meaningful.⁵⁻⁷ Thereby, physicians’ energy, enthusiasm and dedication for their work, their so called work engagement, appears to positively influence their professional performance.^{2,8,9} Highly engaged physicians seem to display more adequate patient safety behaviors and report fewer medical errors.^{2,10} Physicians who are satisfied with their jobs and are empathetic not only make fewer medical errors, but also have patients that are more compliant and satisfied with their care.^{3,4,11} However, dealing with the many job demands, including consistently delivering high quality patient care, working irregular hours and maintaining a good work-life balance, appears to be one of the greatest challenges for medical professionals. The inability to react and cope successfully may lead to impaired well-being with negative personal and professional consequences.^{1,12} Consequences on a personal level are illustrated by studies reporting high levels of physicians’ stress, anxiety, depression and burnout,^{1,13-18} while the negative professional consequences are expressed in reduced levels of patient satisfaction, increased medical errors and suboptimal patient care.^{1-3,11,19-22}

Although residents' well-being and its consequences has been described using quantitative approaches, residents' experience of their well-being in relation to their professional activities and conditions is relatively unknown. This study aims to reduce these gaps by exploring residents' experience of well-being using qualitative research.²³

The research question leading this study is: how do residents experience their own well-being in relation to their professional life? With this study we aim to add to the existing body of knowledge of physician well-being for the purpose of delivering high quality care. We assume new knowledge from the residents' point of view may give direction to improve their well-being directly, or indirectly through the development of resident-specific interventions.

3

METHODS

We conducted an interview study using a phenomenological approach. The purpose of this approach is to understand the essence of the phenomenon, i.c. well-being, from the perspective of those who have experienced it.^{24,25} As our aim is to deepen our insights in the lived experiences of residents regarding their well-being, this phenomenological approach fits our aim.

Participants

To capture a wide variety of experiences, in total 13 residents from different backgrounds were selected by purposeful sampling taking into account residents' year of training, gender, teaching sites and residency training programs.²⁶ Residents were invited to voluntarily participate in the study by mail through residents' associations and through faculty and members of the research group.

Data collection

The in-depth interviews were conducted by one researcher (SSL) from June 2013 to October 2013. This researcher is a surgical resident herself, giving her an excellent understanding of the study subjects and their work contexts. We expected this would contribute to the willingness of the interviewees to share their professional and personal experiences. We also were aware of the possibility that being a resident herself might predispose her to ask questions or interpret responses in ways that confirm her own experience.²⁷ To preempt this we took several precautions. The first two interviews functioned as pilot interviews and were critically discussed within the research team in order to discover favorable phrasing of questions and personal response interpretations, improve interview techniques and adapt our interview guide. Additionally, we continued to discuss the interviews in our research team regularly. A semi-structured interview guide was used to explore participants' experiences and feelings of their well-being and its relation with professional activities and conditions, as well as with their personal life. [See appendix document for the interview guide] In line with our phenomenological approach we focused on the personal experiences and feelings of the participants and encouraged them to describe these in their own words. The interviews were conducted in a place of residents' choice (home or office) in order to encourage the participants to speak freely. The interviews were audio-recorded and the transcripts were anonymized and transcribed verbatim. Interviews were also summarized and sent to the participants to check correctness and additional comments, experiences or questions could be added.

Coding and analysis

All interviews were coded by one researcher (SSL) using qualitative data analysis software MAXQDA Version 11. To discuss and deepen the meaning of the data,

another researcher (IAS) coded interview number three and ten. Differences in coding were discussed until agreement was reached; agreement increased over time. In order to analyze the interviews we used the thematic network analysis. This analysis tries to bring forth the themes at different levels and aim to facilitate the organization and rich description of the data.²⁸ The interviews and template were discussed regularly within the research team to increase completeness and to fit the contents with the coding. The iterative process of data-collection, coding and analysis provided us the possibility to gain overview and uncover our findings during the analysis.

3

Ethical approval

The institutional ethical review board of the Academic Medical Center of the University of Amsterdam waived ethical approval. To protect anonymity and confidentiality of the study participants we took several precautions. Verbal and audio-recorded consent to use the data for research purposes was asked before starting the interview.

RESULTS

Demographics

All 13 invited residents, six women and seven men, agreed to participate in the study. They attended different residency training programs, representing three university hospitals and four non-university teaching hospitals. Saturation was reached after 11 interviews when no new information or themes appeared from the data. However, 13 interviews were analyzed to ensure no new themes emerged. The interview time varied from 30 to 80 minutes. In table 1 the characteristics of the study participants are shown.

Table 1. Characteristics of the study participants

		N (%)
Type of teaching hospital	University	6 (46.2%)
	Non-university	7 (53.8%)
Type of residency training	General surgery	1 (7.7%)
	Neurosurgery	1 (7.7%)
	Obstetrics and gynaecology	1 (7.7%)
	Urology	1 (7.7%)
	Oral Surgery	1 (7.7%)
	Dermatology	1 (7.7%)
	Internal medicine	1 (7.7%)
	Gastrointestinal hepatology	1 (7.7%)
	Emergency medicine	1 (7.7%)
	Cardiology	1 (7.7%)
	Neurology	1 (7.7%)
	Psychiatry	1 (7.7%)
	Family medicine	1 (7.7%)
	Gender	Female
Male		7 (53.8%)
Age	Median (min – max)	30 (26 – 34)
Year of residency	Median (min – max)	3 (1 – 4)

Residents' experience of their well-being

Overarching experiences

During data analysis we identified two striking overarching experiences that exceed the influencing factors and themes: effort-reward balance and autonomy. We will describe and explain these overarching experiences in the next section. After that, we will continue with a description of the identified factors and themes influencing residents' well-being from professional and personal perspective.

3

Effort-reward balance

The effort-reward balance was noted to be important in experiencing well-being. Mentioned rewards are, for example, receiving adequate supervision and appreciation from faculty, getting support from peers, learning new things, feeling to mean something to a patient, or having satisfied patients. Residents describe these rewards as energy-givers. These rewards could counterbalance the extra efforts experienced by residents, such as working irregular hours, giving in on spare time when preparing residency related assignments and dealing with the emotional and mental impact of suffering patients or having to make difficult decisions. The balance between these efforts and rewards seems to impact residents' well-being. For example, residents who experience inadequate supervisory support and incomprehension from peers report experiencing higher levels of stress. On the other hand, when residents experience a high workload because of a difficult and busy consultation day at the outpatient clinic, the reward of appreciation or compliments from a supervisor and satisfied patients could partly undo the (temporary) felt distress. Additionally, residents mentioned they preferred a long, busy, variable working day instead of a short, less dynamic day as that gives less satisfaction. Residents did not mention material compensation as being one of the rewards of their work.

Autonomy

The feeling to be able to make (relatively) autonomous decisions was recurrently mentioned by residents as a factor important for experiencing well-being. Its importance became clear in different resident roles as a caregiver, as a learner, and also in private life. Residents noticed that making decisions about a patients' treatment is often experienced as meaningful and educational, but sometimes as a mental burden. Getting the possibility to do so in a comfortable and entrusted way positively influences well-being because residents felt fulfilled and appreciated. A residents' ability to influence his or her residency training schedule resulted in a feeling of being engaged and having control over decisions in one's life, which enhanced his or her experienced well-being. Also when provided with the opportunity to set their own personal learning goals, choose their own research topic, or to take a break for traveling, gave residents freedom to personalize their own residency training and positively impact their well-being. When talking about work-life balance residents mentioned to feel well when they were able to decide by themselves what to do in their spare time. Mandatory assignments or preparing for presentations were enjoyed less when it had to be done outside of working hours.

Influencing factors for residents' well-being

Using the described residents' experiences we could thematically sort the factors influencing residents' well-being. The way in which residents experienced these factors appeared to reflect their overall experienced well-being. The duration of a positive or negative experience had an important contribution herein. With the experienced influencing factors we identified different themes from professional and personal perspectives: patient care, teamwork, workplace learning, organizational aspects, self-knowledge, work-life balance. Table 2 contains an overview of these themes and the factors influencing residents' well-being and we will further explain these in the following text.

Table 2. Themes and the experienced factors from a professional and personal perspective influencing residents' well-being

Professional themes and factors	
Patient care	<ul style="list-style-type: none">▪ Patient contact▪ Complications & errors▪ Making complex decisions▪ Workload
Teamwork	<ul style="list-style-type: none">▪ Supervisors▪ Peers▪ Multidisciplinary work
Workplace learning	<ul style="list-style-type: none">▪ Work & learning climate▪ Competency development▪ Courses & assignments▪ Assessments & feedback
Organizational aspects	<ul style="list-style-type: none">▪ Duty hours▪ Logistics▪ Administration▪ Bureaucracy
Personal themes and factors	
Self-knowledge	<ul style="list-style-type: none">▪ Personal characteristics▪ Power & pitfalls▪ Coping strategies
Work-life balance	<ul style="list-style-type: none">▪ Time distribution▪ Family & friends▪ Sports & activities

Professional themes

Patient care:

"I receive energy from dealing with patients in the right way; Explaining the situation and what is going on with an ill patient in order to make the patient and family understand what happens, that gives me a feeling of satisfaction."

Having meaningful contact with patients or patients' families give residents energy and a feeling of satisfaction. The fascination with the human body and being allowed to be a part of intense emotions of patients is experienced as unique and beautiful. Residents also describe confronting emotional situations with ill patients, which can negatively influence their experience of well-being for a while. Residents report that experiencing complications or weighting a case from different perspectives and making significant decisions about treatment options can be emotionally and mentally challenging. They particularly find it difficult to let work-related thoughts go when leaving the hospital. They are thinking about it at night and sometimes call the department to check on the patients' actual situation. Workload could be experienced as high when resident have to see too many (complicated) patients in the outpatient clinic, when they have too many tasks at the same time, or when they are continuously being disturbed by a ringing phone. This could leave them feeling overwhelmed or agitated or causing them to lose overview. However, residents like being challenged with diversity of tasks and patient cases in order to learn and feel satisfied

Teamwork:

"I feel supported by my supervisor. He is sometimes a little sharper than I am and it is pleasant to deliberate over and discuss about a patient. This results in a collective feeling that you have formed the best plan for the patient. That gives a good feeling."

The relation and connection with supervisors is an important influencing factor for residents' well-being. When residents experience receptiveness and support in decision-making they feel more confident and appreciated. When conflicts with supervisors arise or when supervisors are not available for deliberation this negatively influences residents' well-being by making them feel anxious and uncertain, and it decreases work satisfaction. Then, peers have a particularly important value for well-being, as they can provide support to each other by just listening, advising, taking over tasks or cheering each other up. Working together and making decisions as a team, with supervisors or for example with colleagues from other specialties, makes them feel good.

3

Workplace learning:

"It is a pleasant feeling when there is an accessible atmosphere in residency training. This makes me more inclined to ask questions, discuss things and encourages to reflect on former situations. It is nice to notice that the supervisors also appreciate this."

Learning climate is extremely important for making residents enjoy their job. When there is an open atmosphere wherein they are offered enough learning opportunities residents feel to be meaningful and satisfied. In an accessible atmosphere residents feel more invited to ask questions and discuss things. When residents change teaching site, they experience sometimes a temporary setback in learning-opportunities as they first have to prove their competency again on different clinical tasks. Courses and conferences are often seen as having both educational value and be entertaining. Residents like to learn new things and to notice progress in knowledge and gained experience. This makes them feel more confident. However, preparing for presentations and learning for exams is often seen as a cost to precious spare time. Assessments in residency training are sometimes experienced as a mental burden, since residents to worry about it in advance. However, these could also give energy if the results are positive.

Organizational aspects:

"What really takes energy is the logistics in this hospital. And the computer system is driving me crazy as well. For the cardiology you have to report in program A and for neurology in program B, that kind of things. It is impossible to work with, it frustrates me. They should throw away this computer system, and some other logistic things."

Duty hours, especially the nightshifts, are sometimes experienced as a factor negatively influencing residents' mood. Residents note to sleep less, feel more tired and less enthusiastic about their job in this period. Slow computer systems and inefficacious logistics where the resident for example needs to make multiple phone calls and fill out a form to just order one investigation are noted to irritate residents. Administration is seen as one of the mandatory and less enjoyable tasks that takes a lot of time, but can give a feeling of calmness when completed.

Personal themes

Self-knowledge:

"I am a perfectionist and the core is that I expect myself to be able to do everything. I want to be thoroughly prepared before starting my outpatient clinic day. That takes a lot of time, especially in the beginning. [.....] I want to do everything perfectly and when that doesn't work out it makes me feel angry."

Residents experience personal strength and power coming from a pro-active and positive mindset, feeling energized and rested. These personal factors enable residents to deal with the demands in their working life. Personal characteristics that make it harder to deal with job demands are also noticed by residents, such as for example, perfectionism, being a brooder or finding it difficult to set boundaries.

Work-life balance:

"I had a busy period with long working days. I quickly noticed that it had an impact on me personally. I didn't have the time to recover from a working day as I was used to. That influenced me and my private life in a way. I did arrive home later than I wanted. And I think my partner has suffered from it as I was more cranky than usual."

3 Residents notice that their job claims a significant amount of time and that they are aware of the need to be flexible with their spare time. Most residents seem to be fine with that as long as they enjoy their job, their functioning in it and if private life enables it. They express the ability to handle busy residency periods because they know it is temporarily, they feel energized by their job, they feel they can be of value and are appreciated. However, residents' private time also appears important because they derive energy from, for example, socializing with friends and family, doing sports, taking a mindfulness course or going on vacation. These 'time outs' are crucial to recharge; residents return feeling fit and energized to perform their job. They feel supported in their private life when being able to ventilate work-related issues and by feeling appreciated by their loved ones.

DISCUSSION

In experiencing (un)well-being in relation to residents' professional life, effort-reward (im)balance and autonomy were found to play a dominant role. Residents' experiences of well-being were also found to be influenced by factors and themes in the professional (patient care, teamwork, workplace learning, organizational aspect) and personal (self-knowledge, work-life balance) realms. When well-being is negatively impacted, emotional and mental well-being are affected first, followed by physical well-being when the experienced imbalance between efforts and rewards continues for too long.

Experience of influencing factors of well-being

When residents were talking about work-related well-being a various amount of factors seemed to play a role. We thematically described the factors residents noticed during the interviews to most influence their experiences: patient care, teamwork, workplace-learning, organizational aspects, self-knowledge and work-life balance. They reported how these factors in combination are responsible for their well-being experience. Residents who report, for example, to enjoy their professional activities, the learning environment and their team, notice to experience an overall good physical, mental and emotional well-being. The experienced influencing factors resonate with research in positive psychology.²⁹⁻³¹ Tiggelaar, for example, described three pillars of work-related happiness: enjoyable, good and meaningful work.²⁹⁻³¹ These pillars could be identified in the residents' experiences and described influencing factors; residents noted that working with kind and helpful colleagues, and having pleasant supervisors positively influenced their well-being (enjoyable work). Additionally, delivering optimal patient care, developing yourself (good work), be meaningful to someone and being appreciated while delivering patient care (meaningful work) seemed to give residents energy and had a positive impact on their well-being. In line with burnout research, residents' well-being could be negatively impacted when residents have negative experiences on more of the described factors or when a negative experience continues too long.^{32,33} First emotional and mental well-being is affected and ultimately also their physical well-being.

Experience of effort-reward balance

The overarching finding of the influence of the efforts and rewards balance on residents' well-being is in accordance with previous work engagement and burnout research.^{33,34} Jennings et al. also reported this balance as important for residents' well-being.³⁵ A contrasting finding with the study from Jennings et al, is that our participating residents did not mention material compensation as a reward. This may

be explained by the differences in residents' financial situations after medical school and during residency training in the Netherlands and the United States. Over 80% of American medical students are in debt when they graduate with an average of US \$86.870.³⁶ This is in contrast with Dutch students having an average debt of US \$17.000 after graduation.³⁷

3 The comments from residents that a compliment from a supervisor or the energy they receive from performing their job well makes them able to handle the busy outpatient clinic day or a negative event is in line with literature about the job demands and resources model showing that resources are capable of buffering the impact of job demands.^{34,38} The job demands and resources model is often used to describe demands and resources influencing work-related well-being.³⁴ This model also shows that personal resources play a significant role in perceptions of stress and experiencing well-being.^{39,40} This is in accordance with our residents' experiences, describing that intrinsic motivation and optimism positively influence the felt energy and thereby the experienced well-being. Ryan and Deci found that conditions supportive of competence and autonomy could facilitate this intrinsic motivation, self-regulation and well-being of human beings.⁴¹ Therefore, enhancing these conditions seems valuable for the individual resident and the health care system.

Experience of autonomy

Previous studies reported autonomy as important for intrinsic motivation and work-related well-being.^{33,34,41} This study confirms these findings also to be valid for the experiences of the residents. One described job resource in the job demands and resources model that could positively influence work-related well-being is autonomy. As an addition to this model we found that the value of autonomy is experienced in different situations. Residents reported that experiencing sufficient autonomy in their various professional roles as caregivers (making treatment decisions) and learners (determine personal learning goals), and also in their private lives (scheduling spare time) is important to feel well and perform well.

The issue of autonomy is in modern residency training reform addressed by introduction of the entrustable professional activity (EPA) concept.⁴²⁻⁴⁴ This concept allows supervisory faculty to make competency-based decisions about tasks or responsibilities that can be entrusted to a resident. As residents noticed the importance of being assigned the appropriate responsibilities, the use of EPA's might improve the feeling of autonomy and therefore the experienced well-being. Secondly, the current personalization of residency training allows for more autonomy. The ability to choose one's own residency training schedule, and define personal learning goals and learning strategies appeared to positively influence residents well-being. This is relevant within the context of self-directed learning.^{45,46} Active learners who have the opportunity to self-direct their own learning process seem to experience better well-being. Additionally, exploring what well-being means for the individual resident could be a relevant part of the individualized residency training program.

Strengths and limitations

By interviewing residents from various hospitals and specialties, we were able to sample a wide set of residents' experiences, resulting in a good impression of residents' experienced well-being and the influencing factors. This provided in-depth information about residents' well-being gives us suggestions for improvement. We choose to interview the residents only once. A longitudinal approach would have also allowed us to identify changes in well-being in relation to specific factors. Although we interviewed residents from all different kinds of specialties, not all specialties are included in this study. Additionally, minority groups might be under represented as we included one resident from a minority group.

Implications

As Hurst et al also mentioned, residents are vulnerable in their demanding learning and work environments.⁴⁷ A perceived good balance between efforts and rewards and sufficient autonomy was found to be essential in experiencing residents' well-being. It seems helpful to offer or make residents aware of the resources that increase resilience and stabilize or enhance well-being.^{35,48-50} Interesting options are to focus on how to balance energy expenditure and energy recovery or doing mindfulness training as this seems to have a positive impact on the experienced well-being.⁵¹⁻⁵³ Expectation management for (starting) residents is in this context also crucial.⁵⁴ When residents meet a different work environment and job content than expected they could end up disappointed, experience a decrease in well-being and quit residency training, as our data also revealed. A good and solid preparation and clear communication before starting and during residency training seem to be of important value. Further research on the best interventions or ways for residents to increase energy levels, stay well or improve well-being is needed.

CONCLUSION

In residents' well-being experiences, autonomy and effort-reward balance were found to play a dominant role. Their well-being is additionally influenced by factors in both the professional and personal realms. The way residents experience these factors and the duration is responsible for their experienced well-being.

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Appendix

Table 3. Semi-structured interview guide

Key questions	Topics
1. How did you experience your work today (/last working day)?	<ul style="list-style-type: none">▪ Contents/tasks▪ Experiences/feelings▪ Example of a good/enjoyable day

We'll try to delve deeper into your well-being. Globally we could divide well-being into 3 domains - physical, mental and emotional well-being - which I would like to address in the following section of the interview.

2. Keeping a period of 4 weeks in mind:	<ul style="list-style-type: none">▪ Well- being on a professional level▪ Well-being on a private level
- How do you experience your physical well-being?	<ul style="list-style-type: none">▪ Influencing factors / energy takers / energy givers
- mental well-being?	<ul style="list-style-type: none">▪ Relation of well-being and professional life as a resident
- emotional well-being?	

CHAPTER 4

Residents' engagement and empathy associated with their perception of faculty's teaching performance

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ABSTRACT

Background Faculty members rely on residents' feedback about their teaching performance. The influence of residents' characteristics on evaluations of faculty is relatively unexplored. We aimed to evaluate the levels of work engagement and empathy among residents and the association of both characteristics with their evaluation of the faculty's teaching performance.

Methods A multicenter questionnaire study amongst 271 surgery and gynecology residents was performed from September 2012 to February 2013. Residents' ratings of faculty's teaching performance are collected using the System for Evaluation of Teaching Quality (SETQ). Residents were also invited to fill out standardized measures of work engagement and empathy using the short Utrecht Work Engagement Scale and Jefferson Scale of Physician Empathy, respectively. Linear regression analysis using generalized estimating equations to evaluate the association of residents' engagement and empathy with residents' evaluations of teaching performance.

Results Overall, 204 (75.3%) residents completed 1814 SETQ evaluations of 302 faculty, and 143 (52.8%) and 140 (51.7%) residents, respectively, completed the engagement and empathy measurements. The median scores of residents' engagement and empathy were 4.56 (scale 0–6) and 5.55 (scale 1–7), respectively. Higher levels of residents' engagement (regression coefficient $b = 0.128$; 95% confidence interval (CI) 0.072–0.184; $p < 0.001$) and empathy ($b = 0.113$; 95% CI 0.063–0.164; $p < 0.001$) were associated with higher faculty teaching performance scores.

Conclusions Residents' engagement and empathy appear to be positively associated with their evaluation of faculty's performance. A possible explanation is that residents who are more engaged and can understand and share others' perspectives stimulate and experience faculty's teaching better than others.

INTRODUCTION

Striving for high quality residency training for many programs requires a systematic evaluation of the faculty's teaching performance.¹⁻⁴ There are multiple reliable and valid specialty-specific instruments now available for assessing teaching performance.¹⁻⁷ Using residents' evaluations to measure faculty's teaching performance encourages them to strive for improvement.^{2-4,7-10} Previous studies have shown that faculty use residents' feedback to enhance their teaching performance.⁹⁻¹¹ Therefore, organizing feedback in a systematic way is essential. In this context, it is important to know which resident-related factors could influence faculty evaluations.

Research into the value and robustness of evaluation systems, especially when used in a summative context, requires identification of the various components that may explain differences between high- and low-performing faculty. It is key because faculty who are to act upon the evaluation results — by adjusting behaviors and enhancing performance — need to trust that their efforts will indeed pay off in terms of improved performance.⁹⁻¹¹ Targeted evaluation-based follow-up actions may involve financial consequences and implications for both faculty and hospitals.

One such evaluation system that is widely used and has instruments for providing reliable and valid teaching performance data is the System for Evaluation of Teaching Qualities (SETQ) in the Netherlands.^{2-4,8,12-17} This system is specifically developed to assess, feedback and possibly enhance faculty's teaching qualities using both residents' and faculty's self-evaluations. Arah et al. demonstrated that residents' evaluations in the SETQ could differentiate between low- and high-performing faculty and that a high proportion of the total variance in teaching performance assessments could be attributed to between-faculty differences.¹² Some known faculty characteristics influencing the evaluations are sex, age, and time devoted to teaching. That is, male faculty, younger faculty, and faculty who spend more time on teaching are more likely to receive higher scores.^{13,18} Also, residents' empathy level has been shown to be associated with better evaluations of faculty's teaching

performance.¹⁹ Beckman et al. reported no associations between residents' quality of life, burnout, or depression with their evaluations of faculty.¹⁹

Other than these points, the influence of residents' characteristics on teaching performance assessments is relatively unexplored. With all the changes in residency training and the more explicit goal of providing high quality of care,²⁰⁻²³ it is time to focus on two important and quality of care-related residents' characteristics: work engagement and empathy.²⁴⁻²⁸ Engagement is defined as a positive, fulfilling, work-related state of mind.^{29,30} Engaged persons have a positive work-related mind-set. Thus, it is reasonable to expect that engaged residents make the most of their interaction with their faculty and are better equipped to give better evaluations to more deserving faculty. To the best of our knowledge, no previous study has evaluated the influence of residents' engagement on residents' evaluations of faculty's performance. Physicians' empathy could be defined as a cognitive attribute that involves the ability to understand patients' inner experiences and perspectives and to communicate this understanding.^{31,32} Empathy is a multidimensional concept involving various components, such as understanding the patients' perspective, providing compassionate care, and standing in the patients' shoes.³¹ We postulated that empathetic residents are more able to understand their faculty's intentions, perspective, and communications and therefore provide them with better feedback on their (teaching) performance. A previous study performed in the United States looked at the influence of residents' empathy on their assessments of faculty.¹⁹

In this study, we investigated: (1) the levels of work engagement and empathy among residents and (2) the associations of both characteristics with their evaluations of their faculty's teaching performance. We hypothesized that residents' engagement and empathy would be positively associated with their evaluations of faculty's teaching performance.

MATERIAL AND METHODS

Study population and setting

This cross-sectional multicenter study was performed in two academic and 15 non-academic medical centers, including 14 surgery and 8 gynecology residency training programs in the Netherlands. We invited 271 residents (including 183 from surgery and 88 from gynecology) by email between September 2012 and February 2013 to participate in the study. They evaluated 302 faculty in 22 different residency training programs.

Measurement instruments

Residents' evaluations of faculty's teaching performance were measured using the validated instruments of the System for Evaluation of Teaching Qualities (SETQ).^{2-4,12} The instruments are specialty-specific, although there were 20 core items spanning five domains that were used across all specialties. They included creating a positive learning climate, displaying professional attitude towards residents, communication of learning goals, evaluation of residents' knowledge and skills, and giving feedback to residents. The SETQ instruments specific to surgery and gynecology included specialty-specific items, to fit the specific training situations of these specialties.^{2,4} Each item could be rated on a 5-point Likert response scale ranging from 1 ('strongly disagree') to 5 ('strongly agree'). SETQ has found to be valid, reliable and feasible. It is widely used, with 240 residency training programs and approximately 7,200 residents and faculty currently participating.^{2-4,12}

Work engagement, defined as a positive, fulfilling, work-related state of mind, was measured using the short version of the Utrecht Work Engagement Scale (UWES-9). This scale contained nine items in three domains: vigor, absorption and dedication. All nine items were reported on a 7-point response scale ranging from 'never' to 'always/daily'. The UWES-9 was found to provide reliable and valid data on

physician work engagement.^{29,33}

Physician empathy, defined as the ability to understand patients' inner experiences and perspectives and the capability to communicate this understanding, was measured using the translated version of the Jefferson Scale of Physician Empathy (JSPE). We used the version that was specifically designed for physicians.³¹ The instrument had 20 items and each item could be answered on a 7-point Likert scale, ranging from 1 ('strongly disagree') to 7 ('strongly agree'). The scale has been translated into 25 languages.³² Translation of this measure into Dutch was carried out according to the forward-back-translation procedure. First, the JSPE was translated into Dutch by two researchers (S.S.L., M.J.M.H.L.). The two Dutch versions were highly comparable and, after discussion, one version was adopted. The Dutch version was then back translated into English by a bilingual but native English-speaking researcher (O.A.A.). We then compared both versions to ensure the accuracy of the translation.³⁴ Several studies have documented the satisfactory psychometric properties of the JSPE.^{31,35-37}

Outcome variables, main predictors, and covariates

The outcome variables were the residents' overall and domain-specific evaluations of faculty's teaching performance, as measured using the validated specialty-specific SETQ instruments. We used two summary measures of these evaluations: (1) faculty's overall (averaged) teaching performance score ranging from 1 to 5 and (2) each of the five domains of teaching performance, namely learning climate, professional attitude towards residents, communication of learning goals, evaluation of residents and feedback (all scores ranging from 1 to 5).

The main predictors were residents' engagement and empathy, as measured with the previously described UWES-9 and JSPE instruments. The total engagement score was the averaged composite score of all 9 items (ranging in value from 0 to 6). The other main predictor, the total empathy score, was measured as the average score of all 20 items (ranging from 1 to 7).

The covariates that we adjusted for in the analytic models were: evaluation period, residents' sex, and residency year.¹³ An important additional covariate we adjusted for was the learning climate. Residents evaluated the learning climate using the validated Dutch Residents Educational Climate Test.³⁸ This questionnaire consists of 50 items and 11 subscales, including supervision, coaching and assessment, feedback, teamwork and peer collaboration.

Data analysis

First we calculated the descriptive statistics to describe the characteristics of the setting and participating residents. We also calculated residents' engagement and empathy scores and residents' (SETQ) evaluations of faculty's overall teaching performance and the teaching performance in the five teaching domains using both means and medians. For sensitivity analysis, we further examined differences in the key outcome and predictor variables between academic and nonacademic training programs and between junior residents (first 3 years of training) and senior residents (last 3 years of training) using an unpaired *t* test.

To evaluate the associations of residents' empathy and engagement with faculty's teaching performance, we performed multivariable adjusted linear regression analyses using generalized estimating equations (GEEs). These GEE analyses accounted for cross-clustering of faculty evaluations in residents and faculty within departments in our sample.³⁹ For example, the evaluations were clustered within residents and faculty as each resident could evaluate different faculty and each faculty could receive evaluations from different residents. Using GEEs allowed us to adjust for the cross clustering of the evaluations within residents and faculty categories. To account for cross clustering at different levels, in addition to the residents and faculty categories, we used 'hospital' and 'specialty' as subject variables in the analyses. We further adjusted for evaluation period, residents' sex, year of residency and learning climate. We reported our results as regression

coefficients and their 95% confidence intervals (CI) for a one-unit increase in the main predictors. The analyses were performed using the statistical software IBM SPSS Statistics version 20.0 (IBM, Armonk, NY, USA).

RESULTS

Among the 271 invited residents, 216 (79.7%) responded to the online invitation. In total, 204 (75.3%) residents completed 1814 SETQ evaluations assessing 302 faculty. Also, 143 (52.8%) residents returned the engagement part of the questionnaire, and 140 (51.7%) residents completed the empathy measures portion. Table 1 shows the characteristics of the setting and participants. Residents' scores on their engagement and empathy measures and their evaluations of faculty's teaching performance are shown in table 2. The Appendix (Tables 5, 6) shows the differences in the key outcome and predictor variables between academic and nonacademic residents and between junior and senior residents. There was a significant difference between academic (mean 3.916) and nonacademic (mean 3.835) residents' scores regarding the faculty's teaching performance.

Table 1. Characteristics of study setting and participants

	Variable	N	%
Setting	Teaching hospitals		
	Academic	2	
	Nonacademic	15	
	Residency training programs	22	
	Faculty evaluated by residents	302	
	Residents evaluations per faculty (mean)	6.0	
Participants	Residents invited/participated	271/216	100/79.7
	Specialty		
	Surgery	153	70.8
	Gynecology	63	29.2
	Gender		
	Male	94	43.5
	Female	109	50.5
	Missing	13	6.0
	Years of residency		
	1-3 years	141	65.3
	4-6 years	62	28.7
Missing	13	6.0	

Table 2. Residents' engagement, empathy scores and their evaluation of faculty teaching performance

Variable	Measurement (scale)	No.	Mean (SD)	Median (IQR)
Engagement	UWES (0-6)	143	4.44 (0.73)	4.56 (4.00-5.00)
Empathy	JSPE (1-7)	140	5.59 (0.62)	5.55 (5.25-6.04)
Teaching Performance	SETQ (1-5)			
Overall score		200	3.90 (0.44)	3.91 (3.63-4.18)
Learning climate		203	3.81 (0.47)	3.82 (3.50-4.10)
Attitude towards residents		202	4.30 (0.41)	4.27 (3.97-4.62)
Communication of goals		192	3.46 (0.66)	3.47 (3.13-3.93)
Evaluation of residents		202	3.82 (0.47)	3.85 (3.54-4.12)
Feedback		201	4.00 (0.45)	4.00 (3.71-4.26)

IQR Interquartile range, *UWES* Utrecht Work Engagement Scale, *JSPE* Jefferson Scale of Physician Empathy, *SETQ* System for Evaluation of Teaching Quality

Table 3 shows the results of the multivariable adjusted regression analysis for the impact of work engagement and empathy on overall teaching performance. Both engagement and empathy were positively associated with overall teaching performance: One-point increases in engagement and empathy were, respectively, associated with 0.128 point (95% CI 0.072–0.184) and 0.113 point (95% CI 0.063–0.164) increases in the overall teaching performance score. Table 4 shows that both engagement and empathy were largely similarly and positively associated with each of the five domains of the teaching performance. Nonetheless, the largest associations of residents' engagement with domains of teaching performance were seen for communication of learning goals (regression coefficient *b* of 0.211; 95% CI 0.130–0.291; *p*<0.001), professional attitude towards residents (*b* 0.121; 95% CI

0.057–0.184; $p < 0.001$), and learning climate (b 0.115; 95% CI 0.052–0.177; $p < 0.001$). The greatest influences of empathy were on professional attitude towards residents, evaluation of residents, and feedback with regression coefficients of 0.122 (95% CI 0.065–0.179; $p < 0.001$), 0.117 (95% CI 0.064–0.170; $p < 0.001$), and 0.139 (95% CI 0.075–0.202; $p < 0.001$), respectively.

Table 3. Regression coefficients for the association of residents’ engagement and empathy with residents’ evaluations of overall teaching performance

Variable	Regression coefficient	SE	95% CI	<i>p</i>
Engagement	0.128	0.0285	0.072–0.184	<0.001
Empathy	0.113	0.0257	0.063–0.164	<0.001

SE standard error, *CI* confidence interval



Table 4. Regression coefficients for the associations of residents' engagement and empathy with residents' evaluations of the various domains of faculty's teaching performance

Variable	Regression coefficient	SE	95% CI	<i>p</i>
Learning climate				
Engagement	0.115	0.0318	0.052–0.177	<0.001
Empathy	0.061	0.0293	0.003–0.118	0.038
Attitude towards residents				
Engagement	0.121	0.0324	0.057–0.184	<0.001
Empathy	0.122	0.0291	0.065–0.179	<0.001
Communication of goals				
Engagement	0.211	0.0412	0.130–0.291	<0.001
Empathy	0.092	0.0367	0.020–0.164	0.012
Evaluation of residents				
Engagement	0.080	0.0295	0.023–0.138	0.006
Empathy	0.117	0.0272	0.064–0.170	<0.001
Feedback				
Engagement	0.096	0.0327	0.032–0.160	0.003
Empathy	0.139	0.0323	0.075–0.202	<0.001

DISCUSSION

Main findings

We investigated how much residents are work-engaged and empathetic and whether residents' engagement and empathy levels are associated with their evaluations of faculty's teaching performance. We found that, generally, the median scores of residents' engagement and empathy were on the high side. Higher levels

of residents' engagement and empathy were associated with faculty's overall teaching performance as well as with the five domains of teaching performance.

Explanation and interpretation of findings

The findings for our first study objective show that the mean work engagement score of our study population (mean 4.4) is in line with that reported by Prins et al., who reported comparable mean scores for surgery residents (mean 4.5) and gynecology residents (mean 4.3).⁴⁰ This mean work engagement score among residents is higher than the mean score given in the UWES manual (mean 3.74).²⁹ This is encouraging and in the interest of patient care as higher engagement is known to be associated with better performance and improved quality of care.^{28,41-43} The summative mean empathy score in our sample [summative mean 112 (20 items x 5.59)] is lower than that reported by Hojat et al. for American physicians (mean 120), although they overlap in confidence interval given our estimated standard deviation of the score (SD 12).³¹ Although our mean empathy score was lower than that described by Hojat et al., this score is comparable to the residents' empathy scores reported in the Italian study of Di Lillo et al. (mean 115).⁴⁴ The difference between empathy scores of our sample and the American sample of Hojat et al. could partially be explained by the variation in expression of empathy in different cultures.³² Another possible explanation could be the difference between physicians' and residents' empathy as there is empathy decline during medical school and residency and because empathy skills develop through experience and training.^{45,46} Further research is needed to investigate this possible difference in empathy levels.

The results for our second objective are in line with our expectations that both engagement and empathy were positively associated with evaluations of teaching performance. As engagement is defined as a positive, fulfilling work-related state of mind,^{29,30} it is likely that engaged residents perceive their work, including their faculty, with a more positive view and could have better experiences as a result. From

empathetic residents we expect better ability to understand others' perspectives and to communicate this understanding.^{31,32} Therefore, it seems likely that they provide faculty with better evaluations on their teaching performance. This finding is consistent with that in the study of Beckman et al.¹⁹

4 Another explanation of the finding that more engaged and empathetic residents evaluate their faculty as better teachers may be found in the Staged Self-Directed Learning Model.⁴⁷ This model proposes that learners advance through developmental stages from dependency to (increasing) self-direction and that teachers can help or hinder that development. Good teachers match the learner's stage of self-direction and help the learner advance toward greater self-direction. Because we expect engaged and empathetic residents (learners) to have a more positive, fulfilling work-related mind-set and to be better at communicating about others' perspectives, it is likely that they are more able to clarify their needs and learning stage. Hence, they stimulate faculty to match their teaching style to meet the needs and learning stage of the residents. A match is needed to ensure confidence and enthusiasm for learning,^{47,48} and may result in better residents' evaluations of faculty's teaching performance. However, we could also argue that the direction of causation of the association we found is the other way around: that good faculty teachers are better able to match residents' learning stage, ensure confidence and enthusiasm for learning, and result in more empathetic and engaged residents.^{47,48} Future longitudinal designed studies should address this issue.

Residents' engagement and empathy were largely similarly associated with each of the five domains of the teaching performance. Although there are overlaps in estimates and confidence intervals of these estimates of the associations, we found some differences in which domains were most associated with either engagement or empathy. For residents' engagement, the greatest influences were on the teaching performance domains communication of learning goals, professional attitudes to residents, and learning climate. Given that engagement implies the willingness to invest effort in one's work and staying involved, energetic and enthusiast,²⁹ it is likely

that engaged residents make the most of their interactions with their faculty, being more attuned to the communication about learning goals, professional attitudes towards them, and learning climate under those faculty members. Consequently, such residents are more likely and able to give the top performing faculty better evaluations on these aspects.

In contrast, the greatest influences of residents' empathy were seen on the domains professional attitude towards residents, evaluation of residents, and feedback. As empathetic residents could better understand faculty's experiences, perspectives, intentions, and perhaps body language,^{31,32} they were probably better at perceiving and evaluating faculty's professional attitude, testing of their knowledge and skills (evaluation domain), and feedback. These aspects of teaching tend to be emotionally involved and can be confronting. A related explanation of associations between the domains evaluation of residents and feedback could be that empathetic residents stimulate and experience better faculty teaching skills in these domains. Taking into consideration that empathetic residents are good at understanding and communicating about others' perspectives and experiences, they consequently could be more open to being evaluated and receiving feedback.⁴⁹

Strengths and limitations

To the best of our knowledge, this is the first study on the associations of residents' engagement with their evaluations of faculty's teaching performance. This fact, together with the multi-center study sample involving 17 teaching hospitals and 22 training programs, are important strengths of our study. A limitation of our study is that because it is an observational, cross-sectional study there is a possibility that we did not measure important confounding variables such as undocumented residents' characteristics and quality of working conditions that could influence residents' engagement and empathy levels and their evaluations of faculty's teaching performance. Another limitation is that the 52% response rate could indicate a

sample bias in our data. We also caution against generalizing these results beyond the Dutch setting as this study was limited to subjects in the Netherlands. It should be seen as further empirical evidence to support the conclusions of Beckman et al., who showed that residents' empathy influenced evaluations of teaching performance in the United States.¹⁹ Our study extends that work by investigating a previously unexplored relationship between residents' engagement and their evaluations of teaching performance in the Netherlands. Therefore, the findings of this study may not be generalized to settings outside the Netherlands. Also, the findings of this study are based on evaluations of two (broad) specialties, namely surgery and gynecology. We, therefore, caution against extrapolating our findings beyond these two specialties.

4

Implications

Future research could explore other factors that influence evaluations of faculty's teaching performance. For example, one might speculate that high-performing residents are qualifying their faculty with higher grades than poorly performing residents. In this study the questionnaires were anonymous, and we do not have the residents' performance grades available. This might be an interesting one to address in future research.

We found that more-engaged residents evaluate their faculty as better teachers. As job resources, including access to adequate supervision and work climate, could play an important role in enhancing work engagement in nonclinical settings,^{50,51} it will be interesting to know if it also plays a role in the residency settings. Better teachers may enhance residents' engagement, and more-engaged residents gain more better teaching. Therefore, better faculty teachers could bring about positive feedback and feed-forward cycles in residency training. As finding the optimal way of residency training is a hot topic at the moment,^{52,53} it is interesting to expand our knowledge on this subject. Empathy levels may be important in stimulating and experiencing

better teaching. Thus it will be crucial to find interventions that effectively enhance and maintain empathy,^{45,46} especially as there is a recently detected decline in empathy among doctors during medical school and residency.⁴⁵ As an incidental finding in the sensitivity analysis we found that residents in academic institutions give higher scores on faculty's overall teaching performance than nonacademic residents. Although the differences are small, these results might be explained by the more teaching-focused setting and faculty in academic hospitals - highlighting an interesting point for further research.

CONCLUSIONS

Residents' engagement and empathy appear to be positively associated with evaluation of the faculty's performance. A possible explanation is that residents who are more engaged and can understand and share others' perspectives stimulate and experience faculty's teaching better than others.

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Appendix

Table 5. Mean scores of residents' engagement, empathy, and evaluations of overall teaching performance in academic versus nonacademic (teaching) hospitals

Variable	Academic hospital	Nonacademic hospital	<i>p</i>
Engagement	4.519	4.414	0.436
Empathy	5.699	5.548	0.204
Teaching performance	3.916	3.835	0.017

Table 6. Mean scores of residents' engagement, empathy, and evaluations of overall teaching performance among residents in their first 3 years versus last 3 years of their residency training

Variable	First 3 years of residency	Last 3 years of residency	<i>p</i>
Engagement	4.443	4.397	0.760
Empathy	5.575	5.631	0.640
Teaching performance	3.845	3.878	0.315

CHAPTER 5

Job resources, physician work engagement, and patient care experience in an academic medical setting

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Acad Med, 2017; Epub ahead of print

ABSTRACT

Purpose Physician work engagement is associated with better work performance and fewer medical errors; however, whether work-engaged physicians perform better from the patient perspective is unknown. Although availability of job resources (autonomy, colleague support, participation in decision making, and opportunities for learning) bolster work engagement, this relationship is understudied among physicians. This study investigated associations of physician work engagement with patient care experience and with job resources in an academic setting.

Method The authors collected patient care experience evaluations, using nine validated items from the Dutch Consumer Quality Index in two academic hospitals (April 2014 to April 2015). Physicians reported job resources and work engagement using, respectively, the validated Questionnaire on Experience and Evaluation of Work and the Utrecht Work Engagement Scale. The authors conducted multivariate adjusted mixed linear model and linear regression analyses.

Results Of the 9,802 eligible patients and 238 eligible physicians, respectively, 4,573 (47%) and 185 (78%) participated. Physician work engagement was not associated with patient care experience ($B = 0.01$; 95% confidence interval [CI] = $-0.02 - 0.03$; $P = .669$). Learning opportunities ($B = 0.28$; 95% CI = $0.05 - 0.52$; $P = .019$) and autonomy ($B = 0.31$, 95% CI = $0.10 - 0.51$, $P = .004$) were positively associated with work engagement.

Conclusions Higher physician work engagement did not translate into better patient care experience. Patient experience may benefit from physicians who deliver stable quality under varying levels of work engagement. From the physicians' perspective, autonomy and learning opportunities could safeguard their work engagement.

INTRODUCTION

The medical community is increasingly acknowledging that physician well-being is an important ingredient for optimal patient care.^{1,2,3} Research has found that poor physician well-being could lead to suboptimally performing health care systems.^{1,4} Accordingly, current hospital accreditation standards encourage hospitals to manage matters of physician well-being.⁵ This call also resonates in modern policies of the Accreditation Council for Graduate Medical Education (ACGME)⁶ and in the renewed Canadian Medical Education Directions for Specialists (CanMEDS).⁷ According to CanMEDS, a competent professional commits to his or her personal well-being to foster optimal patient care and sustainable medical practice.⁷

Studies on physician well-being have focused mostly on physician burnout.⁸⁻¹⁰ These studies show that many physicians experience low energy and suboptimal well-being in their work.^{8,11} Optimal work-related well-being has been widely studied as “work engagement.”¹²⁻¹⁴ Work engagement is marked by a motivational state of positive well-being involving high levels of energy, enthusiasm, and dedication to one’s work. Energetic, dedicated work-engaged professionals are pro-active in attaining work goals and striving for excellence.^{12,15} Research has shown that work-engaged professionals ultimately perform better in their work.^{13,16} Similarly, work-engaged physicians report that they experience a better work ability¹⁷ and commit fewer medical errors.¹⁸ In addition, work engagement is associated with more adequate patient safety-related behaviors and attitudes.¹⁹

Performance of work-engaged physicians has not yet been studied from the patient perspective. Patients’ reported experiences of care, important measures of the patient perspective, have provided unique information on physicians’ performance.²⁰ Research shows that patient care experience is positively associated with patient outcomes such as clinical effectiveness and patient safety.²¹ Yet, whether work-engaged physicians also perform better in the eyes of patients is unknown. We

hypothesized that patients' experiences may be more positive if patients receive care from physicians who are more engaged in their work—and who may, therefore, be more likely to put in more effort into providing optimal care.

In addition to the reported beneficial impact on physician performance,¹⁷⁻¹⁹ work engagement has been associated with less burnout,²² with decreased (sickness) absenteeism,²³ and with greater life satisfaction.²⁴ Work engagement appears to be higher in work environments with adequate job resources that (1) help employees achieve work goals, (2) reduce work demands, and (3) stimulate personal growth, learning, and development.²⁵ Job resources include autonomy, colleague support, participation in decision-making, and opportunities to learn and develop.²⁶ Research shows that job resources increase work engagement especially when demands are high,²⁷ and can thus facilitate physicians' coping with the multiple demands of modern practice.^{1,28} However, few investigators have explored whether job resources should be leveraged to enhance physician work engagement specifically—and if so, which ones. Insight into this topic may support policies for optimizing physician work engagement, which is associated with better work performance.¹³

The authors of this study, therefore, investigated (1) whether physician work engagement is associated with patient care experience, and (2) whether job resources are related to physician work engagement—and if so, which ones.

METHOD

Study population and setting

From April 2014 to April 2015, we collected patient care experience evaluations at ten outpatient clinics of two academic hospitals in the Netherlands. These outpatient clinics comprised cardiology, gastroenterology, internal medicine,

otorhinolaryngology, obstetrics and gynecology, neurology, neurosurgery, nuclear medicine, pediatrics, and pulmonology. At each outpatient clinic, we collected evaluations on a daily basis for approximately two months to ensure inclusion of a representative and large sample of patients for each physician. All patients except those who did not speak Dutch were eligible for participation (research shows that language differences can complicate both patient-physician communication and survey assessment^{29,30}). Participation was voluntary for patients and physicians alike, and we took measures to safeguard the anonymity and confidentiality of all participants. In total, we registered 9,802 Dutch-speaking patients and 238 of their consulting physicians during the study.

For the multilevel setting of our study whereby patients were clustered within physicians, we estimated that if 5-15% of the outcome variance (5-15% of the intraclass correlation coefficient or ICC was comparable to that seen in the literature) were attributable to the physician, then including between 10 and 30 patients per physician would require sampling between 57 and 165 physicians to adequately power the study at 80%, such that the type I error rate was no more than 5%.^{31,32,33} The institutional ethical review board of the Academic Medical Center of the University of Amsterdam waived ethical approval for this study.

Procedure

We informed all physicians—both attending and resident physicians—who provided patient care at the participating outpatient clinics about the study by e-mail and invited them to complete a Web-based survey. Medical secretaries at the outpatient clinics informed the patients about the study and provided an information letter, affirming their anonymity if they agreed to participate. After the consultation, academic students (studying medicine, the health sciences, and/

or psychology) guided patients through the questionnaire following a structured protocol. First, students asked patients if they were prepared to provide anonymous and confidential feedback on their physicians' care on a tablet (Prestigio, Multipad 4 Quantum 10.1, 2014; Apple, Ipad 2/Ipad Mini 2, 2014). After patients gave their oral consent, students opened the questionnaire—provided via the tablet—whereby patients could again read and approve the terms and conditions of the study. Then, patients answered multiple choice questions intended to garner information about their demographics and experience during the just-completed outpatient consultation.

Measures

To measure patient care experience, we used the Dutch Consumer Quality (CQ) index.³⁴ The CQ index is a standardized patient survey tool developed by the Dutch Center for Consumer Experience in Health Care,³⁴ inspired by both the U.S. Consumer Assessment of Health Care Providers and Systems³⁵ and the Dutch Quote (or Quality Of care Through the patients' Eyes) tools.³⁶ The final tool was developed through a systematic literature review, consumer focus groups, stakeholder input, and pilot testing.³⁴ We used 9 items in total to measure physician care behaviors, which we selected based on their suitability to cover, as needed for our study, multiple specialties as well various medical consultations at the outpatient clinic (both new and follow-up consultations). The first six items queried the following physician care behaviors: (1) listening attentively, (2) spending enough time, (3) explaining things clearly, (4) asking about medication use, (5) sharing the decision making, and (6) paying attention to health complaints.³⁷ In agreement with the survey developer (O.A.A.), we rephrased one item slightly to make it broad enough to cover patients' physical and mental health. Rather than, "The doctor spent enough time and attention on *physical* complaints," Item 6 read, "The doctor spent enough time and attention on *health* complaints." We added two more items from the CQ index to cover physicians' (7) paying attention to patients' personal situation and (8) providing

an opportunity for questions.³⁸ We also decided to add an item on whether the physician provided (9) information on continuing treatment, since such information can be considered necessary for adequately informing patients on decisions in their care process.³⁹ Patients answered all items using a 5-point scale that ranged from 1 (“Totally disagree”) to 5 (“Totally agree”). We also provided the option “Not applicable.” In addition, we included questions about patient demographics—self-reported gender, self-rated health, number of previous consultations (with this physician), educational level, and country of birth—since research shows they are associated with patient experience.⁴⁰

Using the Web-based survey, we asked physicians for their age, gender, country of birth, trainee level (resident or attending physician), year of graduation from medical school, specialty, and years of experience in clinical practice. We also asked about their perception of *job resources* and *work engagement*. The four job resources we inquired about were (1) job autonomy, (2) colleague support, (3) participation in decision making, and (4) opportunity to learn and develop. The measures originated from the validated Questionnaire on the Experience and Evaluation of Work (QEEW).⁴¹ Shortened versions of the job resources in this questionnaire are widely studied, including in physician-focused research.⁴² The topics of job autonomy,⁴² colleague support⁴³ and opportunity to learn and develop⁴² each comprised three items, and participation in decision making⁴² comprised four items. Participants answered the questions measuring job autonomy and colleague support through a 5-point-scale ranging from 1 (“Never”) to 5 (“Always”), and they answered the questions about participation in decision making and opportunity to learn and develop using a 5-point-scale ranging from 1 (“Totally disagree”) to 5 (“Totally agree”). All scales were identical for residents and specialists; however, for colleague support, residents could rate the support of their *resident* colleagues and specialists could rate this for their *specialist* colleagues.

We measured work engagement using the 9-item Utrecht Work Engagement Scale (UWES-9),⁴⁴ which has been extensively validated in various occupational groups, including physicians.¹⁶ Physicians could self-report their engagement in their work on a 7-point scale from 0 (“Never”) to 6 (“Always/Daily”).

Statistical analyses

We calculated the overall mean for the study measures including job resources, physician work engagement, and patient care experience. To study psychometric properties of the study measures, we performed principal components analysis (PCA) with varimax rotation, item-to-scale correlations, and reliability analysis for internal consistency. For internal consistency, we considered a Cronbach’s alpha of 0.7 or higher as acceptable.

5 To study associations between physician work engagement and patient care experience, we conducted mixed linear model analysis using random intercept to account for clustering of patients within physicians. Hence, we used patient evaluations as clustering variables. We included only patients of 16 years and older in the analysis.⁴⁵ We adjusted the analysis for patient variables (age, sex, self-rated health, number of appointments with evaluated doctor, country of birth, educational level) as well as physician variables (age, sex, and training level) by including these as covariates in the analysis. To adjust for variance within outpatient clinics, we considered outpatient clinic to be a fixed effect in the analysis.

Lastly, we performed linear regression analyses to study the associations between the four job resources (independent variables) and physician work engagement (dependent variable). We adjusted these analyses for physician gender, years of experience, training level (resident or attending physician), and specialty by treating them as covariates.

For both the mixed linear models and the linear regression analysis, we tested whether training level moderated the association between the predictor (work engagement in the mixed linear model and job resources in the linear regression analysis) and the outcome (patient care experience for the mixed linear model and work engagement for the linear regression analysis). To that end, we added to each respective analysis, a product term of training level and the concerning predictor. In case the product term showed a non-zero association with work engagement, we reported results separately for attending physicians and residents. We performed all analyses using SPSS 20.0 (IBM, Armonk, New York).

RESULTS

During the study period, we registered visits by 9,802 patients at the participating outpatient clinics, and of these, we collected evaluations for 4,573 (47%); 238 physicians conducted these visits, and of these 185 (78%) completed the survey (Table 1). Of the 185 physicians, 103 were attending physicians, and the remaining 82 were residents. For the 185 participating physicians, 4,130 patient evaluations were available (the 443 remaining patient evaluations concerned the physicians who did not participate in the study). The 4,130 patient evaluations resulted in an average of 22.3 patient evaluations per participating physician.

Table 1. Demographics of Physicians and Patients Participating in a Study of Job Resources, Work Engagement of Physicians, and Patient Experience of Care, 2014–2015^a

Characteristics of physicians^b	No. (% of 185)
Female	88 (47.6)
Training level	
Residents	82 (44.3)
Attending physicians	103 (55.7)
Specialty	
Cardiology	33 (17.8)
Gastroenterology	26 (14.1)
Internal medicine	8 (4.3)
Obstetrics and gynecology	22 (11.9)
Otorhinolaryngology	26 (14.1)
Pediatrics	3 (1.6)
Pulmonology	18 (9.7)
Neurology	35 (18.9)
Neurosurgery	10 (5.4)
Nuclear medicine	4 (2.2)
Characteristics of patients^c	No. (% of 4,573)
Female	2,595 (56.7)
Age	
16 – 30 years	604 (13.2)
31 – 50 years	1,311 (28.7)
51 – 70 years	1,983 (43.4)
71 years and older	675 (14.8)
Outpatient clinic	
Cardiology	786 (17.2)
Gastroenterology	482 (10.6)
Internal medicine	384 (8.4)
Obstetrics and gynecology	660 (14.4)
Otorhinolaryngology	901 (19.7)
Pediatrics ^b	13 (0.3)
Pulmonology	455 (9.9)

Neurology	655 (14.3)
Neurosurgery	111 (2.4)
Nuclear medicine	126 (2.8)
Appointment with doctor	
First	1,783 (39.0)
Second	655 (14.3)
Third	414 (9.1)
Fourth or beyond	1,721 (37.6)
Self-rated health	
Poor / moderate	2,463 (53.9)
Good / very good	2,110 (46.1)
Country of birth	
Netherlands	3,556 (77.8)
Aruba	4 (0.1)
Duth Antilles	54 (1.2)
Germany	25 (0.5)
Indonesia	61 (1.3)
Morocco	70 (1.5)
Suriname	397 (8.7)
Turkey	44 (1.0)
Other	362 (7.9)
Highest level of educational attainment	
No education	80 (1.8)
Primary education	253 (5.5)
Secondary education	2,434 (53.2)
Higher / academic education	1,708 (37.4)
Unknown	98 (2.1)

^aThis study occurred at 10 outpatient clinics associated with two hospitals. In this study, job resources are autonomy, colleague support, participation in decision making, and opportunity to learn and develop.

^bThe physicians participating in this study were, on average, 41.7 years old (standard deviation [SD] = 10.6). A mean of 15.2 years (SD = 10.2) had passed since they had graduated from medical school. They received a mean of 22.3 patient evaluations (SD = 17.0) each.

^cThe authors included only patients who were 16 years of age or older.

On the basis of the PCA on patient care experience, the 9 separate items emerged as one factor. This single factor reflected a satisfactory Cronbach's alpha of 0.83 for patient care experience measurement (Table 2). The four job resources—autonomy, colleague support, participation in decision making, and opportunity to learn and develop—and work engagement showed acceptable to good rates for internal consistency and all items showed adequate factor loadings (Table 2).

Table 2. Psychometric Properties of Scales Used in a Study of Job Resources, Work Engagement of Physicians, and Patient Experience of Care, 2014–2015^a

Scale, subscale, item number, and item	Mean (Standard deviation) [Range]	Factor loadings	Item-to-scale correlations	Cronbach's alpha
Job resources				
Job autonomy	3.43 (0.70) [2-5]			0.74
1. Freedom in conducting work	3.58 (0.84) [1-5]	0.85	0.83	
2. Deciding how to perform work	3.51 (0.83) [2-5]	0.88	0.85	
3. Share in decisions about work	3.21 (0.91) [1-5]	0.71	0.76	
Colleague support				
Colleague support	4.00 (0.71) [1.67-5]			0.77
1. Opportunity to ask for colleague support	4.30 (0.84) [1-5]	0.81	0.81	
2. Colleague support when facing difficulties	3.99 (0.91) [2-5]	0.86	0.86	
3. Appreciation by colleagues	3.71 (0.83) [1-5]	0.81	0.81	
Participation in decision making				
Participation in decision making	3.54 (0.67) [1.25-5]			0.79
1. Active involvement in important decisions	3.37 (0.92) [1-5]	0.80	0.81	

2.	Participation in allocation of work tasks	3.41 (0.89) [1-5]	0.90	0.89
3.	Participation in work shift planning	3.60 (0.90) [1-5]	0.74	0.76
4.	Influence on how to conduct work	3.78 (0.70) [2-5]	0.69	0.68
Opportunity to learn and develop		4.00 (0.58) [1-5]	0.83	
1.	Opportunity to enhance qualities	3.82 (0.71) [1-5]	0.88	0.89
2.	Opportunity to develop in work	3.93 (0.72) [1-5]	0.92	0.92
3.	Opportunity to learn new skills	4.24 (0.60) [1-5]	0.78	0.77
Physician work engagement		4.39 (0.90) [0.44-6]	0.92	
1.	I am enthusiastic about my work	4.75 (0.99) [1-6]	0.84	0.83
2.	My work inspires me	4.77 (1.10) [0-6]	0.79	0.78
3.	I am proud of the work that I do	4.41 (1.08) [0-6]	0.87	0.85
4.	I feel happy when I am working intensely	4.64 (0.94) [1-6]	0.87	0.86
5.	I am immersed in my work	4.43 (1.15) [0-6]	0.75	0.75
6.	I get carried away when I'm working	4.50 (1.01) [1-6]	0.83	0.83
7.	In my work I feel bursting with energy	4.37 (1.15) [0-6]	0.82	0.82
8.	In my work I feel strong and vigorous	4.34 (1.12) [0-6]	0.74	0.75
9.	When I get up in the morning, I feel like going to work	3.47 (1.65) [0-6]	0.68	0.73

Patient experience	4.61 (0.43) [1-5]			0.83
1. Doctor listened attentively	4.75 (0.47) [1-5]	0.73	0.69	
2. Doctor explained things clearly	4.73 (0.49) [1-5]	0.75	0.68	
3. Doctor spent enough time	4.68 (0.55) [1-5]	0.78	0.74	
4. Doctor paid attention to personal situation	4.49 (0.72) [1-5]	0.67	0.69	
5. Doctor paid attention to health complaints	4.66 (0.56) [1-5]	0.78	0.75	
6. Doctor asked about medication use	4.32 (1.12) [1-5]	0.41	0.57	
7. Doctor enabled shared decision making	4.43 (0.80) [1-5]	0.63	0.68	
8. Doctor provided opportunity for questions	4.71 (0.53) [1-5]	0.75	0.73	
9. Doctor provided information on care continuation	4.68 (0.55) [1-5]	0.73	0.71	

^aThe scale used to measure physician job resources was the validated *Questionnaire on the Experience and Evaluation of Work*⁴¹; the scale used to measure work engagement was the *Utrecht Work Engagement Scale*⁴⁴; and the scale used to measure patient experience was the *Consumer Quality index*.³⁴

As detailed in Table 3, we found no association between physician work engagement and patient care experience ($B = 0.01$; 95% confidence interval [CI] = $-0.02 - 0.03$; $P = .669$). This finding remained unchanged in further analyses accounting for different levels of training (attending physicians vs. residents).

Autonomy was positively associated with physician work engagement ($B = 0.31$, 95% CI = $0.10 - 0.51$, $P = .004$)—as was the opportunity to learn and develop ($B = 0.28$; 95%

CI = 0.05 – 0.52; $P = .019$). Additional analyses showed that the association between autonomy and work engagement was especially applicable to attending physicians ($B = 0.35$; 95% CI = 0.08 – 0.61; $P = .010$) while the association between opportunity to learn and develop and work engagement was especially applicable to residents ($B = 0.69$; 95% CI = 0.28 – 1.12; $P = .001$). Colleague support and participation in decision making did not show associations with work engagement (respectively, $B = 0.15$; 95% CI = -0.04 – 0.33; $P = .114$ and $B = 0.22$; 95% CI = -0.02 – 0.46; $P = .071$). See Table 4 for further details.

Table 3. Unstandardized Regression Coefficients (B) and 95% CIs for the Association Between Physician Work Engagement and Overall Patient Experience in a Study of Job Resources, Work Engagement of Physicians, and Patient Experience of Care, 2014-2015^a

Physician work engagement	Patient experience ^a	
	B (95% CI)	P value
Overall	0.01 (-0.02 – 0.03)	0.669
1. Doctor listened attentively	-0.00 (-0.03 – 0.02)	0.813
2. Doctor explained things clearly	0.01 (-0.02 – 0.03)	0.549
3. Doctor spent enough time	-0.00 (-0.03 – 0.03)	0.801
4. Doctor paid attention to personal situation	0.00 (-0.03 – 0.04)	0.854
5. Doctor paid attention to health complaints	0.01 (-0.02 – 0.03)	0.742
6. Doctor asked about medication use	0.03 (-0.04 – 0.09)	0.405
7. Doctor enabled shared decision making	0.00 (-0.03 – 0.04)	0.876
8. Doctor provided opportunity for questions	-0.00 (-0.03 – 0.02)	0.841
9. Doctor provided information on care continuation	0.01 (-0.02 – 0.04)	0.474

Abbreviations: CI indicates confidence intervals and AIC indicates Akaike Information Criterion.
^a*The global goodness of fit measures are as follows: the AIC for the null model (i.e., no predictors) is 4,693,405 and the AIC for the fully adjusted model is 4,542,116. The authors controlled the analysis for clustering of patients within physicians, and they adjusted for physician gender, age, and level of training (attending physician or resident), as well as patient gender, age, self-rated health, education level, and country of birth. The authors treated outpatient clinic as a fixed effect. In this study, job resources are job autonomy, colleague support, participation in decision making, and opportunity to learn and develop.*

Table 4. Unstandardized Regression Coefficients (B) and 95% Confidence Intervals (CI) for the Associations Between the Four Job Resources Scales and Physician Work Engagement in a Study of Job Resources, Work Engagement of Physicians, and Patient Care Experience, 2014–2015^a

Job resources	Work engagement					
	Overall sample		Attending physicians		Residents	
	B (95% CI)	P	B (95% CI)	P	B (95% CI)	P
Job autonomy	0.31 (0.10 – 0.51)	0.004	0.35 (0.08 – 0.61)	0.010	0.25 (-0.06 – 0.55)	0.109
Colleague support	0.15 (-0.04 – 0.33)	0.114	0.12 (-0.13 – 0.36)	0.362	0.19 (-0.06 – 0.43)	0.133
Participation in decision making	0.22 (-0.02 – 0.46)	0.071	0.28 (-0.05 – 0.61)	0.092	0.21 (-0.11 – 0.53)	0.193
Opportunity to learn and develop	0.28 (0.05 – 0.52)	0.019	0.13 (-0.16 – 0.41)	0.392	0.69 (0.28 – 1.12)	0.001

^aThe test of the association between job resources and work engagement was controlled for physician gender, age, specialty and years of being a doctor. R2 (explained variance) for the overall sample is 0.305; for the attending physicians, 0.278; and for the residents, 0.327.

DISCUSSION

Main findings

This study in an outpatient setting in The Netherlands indicates that physicians' work engagement is not associated with their performance as perceived by patients and that physicians perceive autonomy and opportunities to learn and develop as job resources for their work engagement. Specifically, autonomy was identified as an especially valuable job resource for attending physicians, while opportunities to learn and develop were especially valuable for resident work engagement.

Possible explanation of findings

According to previous research, work engagement facilitated high performance.^{16,18} Interestingly, the findings of this current study show that physician work engagement may not necessarily be associated with better performance as perceived by patients. The patients in this current study reported performance specifically regarding physicians' interpersonal behaviors, such as listening attentively.³⁵ As documented in a systematic review, inappropriate interpersonal behaviors of physicians are infrequently observed.⁴⁶ In general, physicians receive extensive training—throughout their formal education and beyond—regarding professional interpersonal behaviors with patients.⁴⁶ Possibly, this extensive training and experience may act as a safeguard to uphold standards for professional interpersonal behaviors—even in the face of low engagement or disengagement at work.

However, as this is, to our knowledge, the first study of work engagement and patient care experience, we accordingly encourage caution in interpreting the results. Whereas previous work engagement research in health care has focused on supervisor-, resident- or self-evaluated performance,^{16,18,19,47} the current study specifically involved patient-evaluated performance. Like other studies of patient-evaluated performance,⁴⁸⁻⁵¹ our patient care experience ratings are highly positive and scores vary only minimally. This low variability and positive valence may have affected potential between-physician differences.⁵² Future research could include narrative patient feedback of physicians to obtain more detailed insight into the role of physician work engagement in the patient care experience.

Our findings—along with findings from previous research^{16,44,53} showing that levels of physician work engagement are not higher than average—indicate an opportunity

to better enable physician engagement. For physicians, particularly attending physicians, optimizing autonomy may facilitate greater engagement. Although autonomy has traditionally been one of the corner stones of the medical profession, it has gradually decreased with the rise of standardization of care and the increased requirements demanded by quality management, accountability, and bureaucracy in modern health care.^{54,55} In light of these modern developments, our findings, which do not necessarily point to high levels of physician autonomy (Table 2), may be expected. Increasing autonomy levels may support physician work engagement; adjusting physicians' work conditions accordingly may be worth considering.

5 Our results showed that learning and development opportunities stimulate physician work engagement, especially among residents. The ongoing pursuit of training—that is, lifelong learning—is a value of the medical profession. Our finding may indicate that residents embrace this value as they are more engaged when offered more learning possibilities. Research shows that compared to extrinsic incentives (e.g., financial rewards), intrinsic incentives for learning (e.g., feedback that permits physicians to independently improve their practice) leads to better improvement⁵⁶; therefore, we advocate formative performance measures that stimulate intrinsic motivation for learning instead of external quality control.⁵⁷ Besides being potentially fruitful for physicians' performance growth, formative measures in service of learning may also ultimately enhance physician engagement and well-being.

Study strengths and limitations

The use of on-site tablet computers loaded with the survey tool enabled the large sample size in this study (4,573 patients). Similarly, the assistance of students facilitated survey completion (a meta-analysis⁵⁸ has shown that self- and assisted-

survey-completion result in overall equivalent scores.) The response rate of the patient sample in this study (4.7%) was in the range of common response rates for this type of research (30-60%).⁵⁹⁻⁶¹ Still, we acknowledge that higher response rates would benefit patient experience-focused research. The (on average) 22.3 patient evaluations per physician in the current study resulted in robust and reliable patient care experience measurement.⁴⁹ The 78% physician response rate contributed to a representative display of job resources and work engagement as perceived by the physicians under study. Given the cross-sectional nature of the study data, we cannot guarantee causality regarding the association between job resources and work engagement; nonetheless, previous research in health care using longitudinal data has indicated that job resources were antecedents of work engagement in the long term.^{23,53} Our study included only quantitative measures of job resources, yet other measures of job resources, (e.g., the amount of learning opportunities) and qualitative measures (such as the nature of autonomy), could add to the understanding of this topic.

Implications

Results of this pioneer study on physician work engagement and patient care experience contrast with previously reported results indicating that work engagement tends to positively affect patient care quality.^{18,19} Since the current study is, to our knowledge, the first to link physician work engagement to performance as evaluated by patients specifically, the findings should be considered preliminary; more research is needed. Other investigations could examine additional indicators and measures of patient-evaluated performance in various care settings (outpatient versus inpatient or academic versus non-academic). Fostering optimal physician work engagement could benefit from enabling more autonomy, whereby physicians could participate in specific interventions that successfully promote feeling increasing control over the highly dynamic work environment in health care.⁶² Team-based peer support could offer

additional possibilities for promoting physician autonomy.⁶³ Research shows that such programs eventually decrease health care providers' burnout levels⁶³; we expect they might also enhance engagement. Finally, our findings point to the need for optimizing job resources to the specific training level of physicians: attending physicians especially value autonomy, and residents especially value learning opportunities.

CONCLUSIONS

At a time when physicians' work is strained, the average levels of physician work engagement presented in this study represent a positive contrast to reported concerns regarding physicians' well-being.¹ Although research suggests that work engagement positively affects patient care,^{18,19} this study indicates that work engagement is not necessarily associated with physicians' performance as perceived by patients. According to our physician respondents, greater autonomy and increased learning opportunities could safeguard or strengthen engagement in physicians' work. Ultimately, a highly engaged physician workforce requires stimulating and healthy conditions that allow physicians to grow, to work autonomously, and to provide outstanding patient care even within the challenging context of modern health care.

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CHAPTER 6

Learning climate positively influences residents' work engagement and job satisfaction

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ABSTRACT

Objectives An optimal learning climate is crucial for the quality of residency training and may also improve residents' well-being and empathy. Therefore, the authors investigated the associations of learning climate with residents' work engagement, work satisfaction, and empathy.

Methods A cross-sectional, multicenter, web-based questionnaire study was performed and 271 surgery and gynaecology residents in 21 training programs were invited to participate from September 2012 to February 2013. Residents were asked to fill out work-related well-being measurements, namely work engagement using the Utrecht Work Engagement Scale, job and specialty satisfaction using measures from Physician Worklife Study, and physician empathy using the Jefferson Scale of Physician Empathy. The Dutch Residency Educational Climate Test, consisting of 9 domains, was used to evaluate learning climate. These individual residents' evaluations were aggregated to program level to represent the overall learning climate score and domain scores of each residency training program. Multivariable adjusted linear regression analyses were used to estimate associations of the learning climate with these work-related well-being measures.

Results The work-related well-being measures were completed by 144 (53.1%) residents. The learning climate was evaluated by 193 residents, yielding 9.2 evaluations per training program on average. The overall learning climate score was positively associated with work engagement (regression coefficient $b = 0.58$; 95% confidence interval (CI) = 0.18–0.98; $p = 0.004$) and job satisfaction ($b = 0.80$; 95% CI = 0.48–1.13; $p < 0.001$). Two learning climate domains in particular, 'educational atmosphere' and 'formal education', were associated with higher residents' engagement. Job satisfaction was influenced by learning climate domains 'educational atmosphere', 'teamwork', role of specialty tutor', 'resident peer collaboration', 'work adapted to competence' and 'accessibility supervisors'. No associations were found between learning climate and empathy and specialty satisfaction.

Conclusion Residents' work engagement and job satisfaction are positively associated with the learning climate and may be increased by improving the learning climate of residency training programs.

INTRODUCTION

Physicians' well-being is presumed a quality indicator for health care systems.¹ This topic is getting worldwide attention as we know that physicians are experiencing high work-related pressure and this is detrimental to the experienced well-being, which could have negative individual and professional consequences.¹⁻³ Work engagement and work satisfaction are important aspects of work-related well-being and are found to be related to professional performance and quality of patient care. Work engagement could be defined as a positive, fulfilling, work-related state of mind and the opposite of burn-out.^{4,5} Engaged physicians report fewer medical errors, perform better and show more adequate safety behaviors.^{2,6-8} Likewise, physicians' work satisfaction is associated with better patient care delivery and more satisfied patients.^{9,10} In general, a lack of work-related well-being or experiencing distress could lead to a decrease in physicians' empathy.^{11,12} This is unfortunate because decreased empathy will inhibit physicians' ability to understand, communicate, and respond to patients' perspectives and experiences, thus reducing patient satisfaction, compliance and safety.^{3,13-17}

It is essential to understand which factors influence physicians' well-being. Besides working irregular hours and a lack of autonomy, workload is seen as one of the major aspects negatively influencing work-related well-being.^{1,18,19} Social support, receiving performance feedback, having a positive impact on patients' lives and successful patient outcomes, however, are factors found to be positively related to physicians' well-being.^{18,20,21}

In addition, a less healthy learning climate was recently shown to be associated with burnout among residents, lowered quality of life in orthopedic trainees, and medication errors among nurses.²²⁻²⁴ Learning climate in residency training contains the formal and informal aspects of education.²⁵ However, there is little research linking learning climate and its distinct domains to a broader set of measures of work-related well-being and to empathy in residency training. This study aims to fill this void.

The learning climate is known to be crucial for optimizing training outcomes, and seen as an important quality indicator of postgraduate medical education programs.²⁶⁻²⁸ It can be measured with validated tools. We used the Dutch Residency Educational Climate Test (D-RECT), consisting of nine separate learning climate domains: educational atmosphere, teamwork, role of specialty tutor, coaching and assessment, formal education, resident peer collaboration, work adaptation to residents' competence, accessibility of supervisors, and patient sign out.^{29,30} Besides the importance for the quality of residency training, it is key to investigate the impact of the learning climate on residents' work-related well-being and empathy. Especially, given the fact that physicians' work-related well-being and empathy are crucial for the quality of patient care.^{1-3,6-9,13,22,23}

We hypothesize that a positive and supportive learning climate improves residents' work engagement and their feeling of work satisfaction. Additionally, we postulate that a positive and supportive learning climate facilitates the development of residents' ability of understanding others' perspectives and communicate this understanding and is therefore positively associated with residents' empathy. Thus, in this study, we aim to investigate the association of learning climate with (i) residents' work engagement, (ii) job and specialty satisfaction and (iii) empathy.

METHODS

Study population and setting

We performed a cross-sectional, multicenter questionnaire study and invited 271 surgery and gynaecology residents, in 21 residency training programs, from two academic and 14 non-academic medical centers in the Netherlands. The residents were invited to participate to a web-based survey by email between September 2012 and February 2013. For most residents the work-related well-being measures and the learning climate measure were administered at the same time. However,

in some training programs, the measures were administered in a different order depending on logistic reasons and choice of the program director. All precautions were taken to protect anonymity and confidentiality of the study participants. The institutional ethical review board of the Academic Medical Center of the University of Amsterdam was consulted and waived ethical approval.

Measures

Work-related well-being (outcomes): work engagement, job and specialty satisfaction and empathy

To measure work engagement of the residents we used the short version of the Utrecht Work Engagement Scale (UWES-9). This reliable and valid scale consists of nine items on three domains (vigor, absorption and dedication) and these items are measured on a 7-point scale (0 = never, 1 = almost never, 2 = rarely, 3 = sometimes, 4 = often, 5 = very often, 6 = always/daily).^{4,31,32}

The global job and specialty satisfaction measures from the Physician Worklife Study were used to measure work satisfaction of the residents.^{33,34} The two global measures evaluate job satisfaction and specialty satisfaction with five and three items respectively and each item could be rated on a 5-point Likert scale. [See Appendix document for the items of the global job satisfaction and global specialty satisfaction measures] The scale ranges from 1 (strongly disagree) to 5 (strongly agree). Translation of these measures into Dutch was carried out by three of the authors (SSL, MJMHL, OAA) using the forward-back-translation procedure.³⁵

We used the Jefferson Scale of Physician Empathy (JSPE) to evaluate residents' empathy.^{17,36,37} This validated instrument contains 20 items which can be rated on a 7-point Likert scale that ranges from 1 (strongly disagree) to 7 (strongly agree). This instrument was also translated into Dutch following the appropriate forward-back-translation procedure.³⁵

Learning climate (predictor variable)

We used the Dutch Residency Educational Climate Test (D-RECT) to evaluate the learning climate of each residency training program.^{29,30} The D-RECT is the instrument most used for measuring learning climate in residency training in the Netherlands, and other health care systems.³⁸⁻⁴⁰ Both the original D-RECT and the modernized (revised) D-RECT were found to be reliable and valid.^{29,30} We used the latter updated structure of the D-RECT consisting 9 learning climate domains and 35 items. Each item could be rated on a 5-point Likert scale, ranging from 1 (totally disagree) to 5 (totally agree). Three resident evaluations are needed to reliably rate the overall learning climate but eight resident evaluations are needed for the separate climate domains: (1) educational atmosphere, (2) teamwork, (3) role of specialty tutor, (4) coaching and assessment, (5) formal education, (6) resident peer collaboration, (7) work adaptation to residents' competence, (8) accessibility of supervisors, and (9) patient sign out. In this study, the individual residents' evaluations on learning climate were aggregated to program level to represent the overall learning climate score and domain scores of each residency training program.

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Data analyses

To describe the characteristics of the setting and participating residents we first calculated the descriptive statistics. Next, we calculated the mean and median scores of the four outcome measures residents' work engagement, empathy, job and specialty satisfaction as well as the mean and median scores of the overall learning climate and the nine specific learning climate domains.

For relating the predictor variable, namely learning climate, to the four outcome variables we performed multivariable adjusted linear regression analysis using generalized estimating equations (GEEs). We performed separate analyses for the overall learning climate and the nine learning climate domains with the outcome

variables. Using GEE allowed us to account for cross-clustering or nesting of the evaluations.⁴¹ We accounted for cross-clustering of residents' perceptions of the learning climate within residency training programs and hospitals. Additionally, we adjusted for gender and year of residency by treating them as covariates in the analyses. Our results were reported as regression coefficients with 95% confidence intervals. We used the false discovery rate (FDR) to adjust the *p*-values from the multiple testing to reduce our chances of accepting false positive results.^{42,43} Statistical analyses were performed with IBM Statistics SPSS 20.0 and SAS 9.4 (SAS Inc., Cary, NC).

RESULTS

The work-related well-being measurements were completed by 144 (53.1%) residents. The learning climate of 21 residency training programs was evaluated by 193 residents with a mean of 9.2 (range 4-20) residents' evaluations per training program. As described in the methods, we aggregated these residents' evaluations on learning climate to program level to represent the overall learning climate score and domain scores of each residency training program. The characteristics of the study setting and participants are described in table 1. Table 2 shows the residents' scores on work engagement, job and specialty satisfaction, empathy and the learning climate scores including the different domains on training program level.

Table 1. Characteristics of study setting and participants

	Variable	N	%
Setting	Teaching hospitals		
	Academic	2	
	Non-Academic	14	
	Residency training programs	21	
	Residents evaluations of learning climate per training program, mean (min-max)	9.2 (4-20)	
Participants	Specialty		
	Surgery	111	77.1
	Gynaecology	33	22.9
	Gender		
	Male	74	51.4
	Female	65	45.1
	Missing	5	3.5
	Year of residency		
	0-3 years	92	63.9
	4-6 years	47	32.6
Missing	5	3.5	

Table 2. Residents’ engagement, empathy, job and specialty satisfaction scores and the overall and domain scores of the learning climate on training program level

Outcome variable	Measurement (scale)	N	Mean (SD)	Median (IQR)
Engagement	UWES (0–6)	142	4.44 (0.74)	4.56 (4.00–5.00)
Job satisfaction	(1-5)	142	4.12 (0.62)	4.20 (3.80-4.60)
Specialty satisfaction	(1-5)	142	4.00 (0.74)	4.00 (3.33-4.67)
Empathy	JSPE (20–140)	139	111.78 (12.44)	111 (105–121)
Learning climate	DRECT (1–5)			
Overall score		21	3.78 (0.23)	3.80 (3.62-3.93)
Educational atmosphere		21	3.81 (0.35)	3.76 (3.53-4.09)
Teamwork		21	3.91 (0.37)	3.82 (3.63-4.18)
Role of specialty tutor		21	4.00 (0.26)	4.00 (3.77-4.18)
Coaching and assessment		21	3.18 (0.24)	3.17 (3.01-3.42)
Formal education		21	3.59 (0.35)	3.54 (3.34-3.83)
Resident peer collaboration		21	4.37 (0.25)	4.38 (4.21-4.56)
Work adapted to competence		21	3.75 (0.32)	3.67 (3.50-4.04)
Accessibility supervisors		21	4.25 (0.27)	4.23 (4.11-4.40)
Patient sign-out		21	3.56 (0.43)	3.45 (3.38-3.84)

The results of the multivariable adjusted linear regression analysis to evaluate the associations of learning climate with work engagement, job and specialty satisfaction, and empathy are shown in table 3. The overall learning climate was positively associated with work engagement (regression coefficient $b = 0.58$; 95% confidence interval (CI) = 0.18–0.98; $p = 0.004$) and with job satisfaction ($b = 0.80$; 95% CI = 0.48–1.13; $p < 0.001$). We found no association

of the overall learning climate with specialty satisfaction or empathy. Focusing on the learning climate domains, table 4 shows the associations between the different learning climate domains and work engagement, job and specialty satisfaction and empathy. Work engagement was found to be positively influenced by the learning climate domains educational atmosphere ($b = 0.34$; 95% CI = 0.11–0.58; $p = 0.004$) and formal education ($b = 0.37$; 95% CI = 0.14–0.60; $p = 0.001$). Educational atmosphere was also positively correlated with job satisfaction ($b = 0.45$; 95% CI=0.16–0.74; $p = 0.003$). Additionally, the results show positive associations for the following learning climate domains with job satisfaction: teamwork ($b = 0.48$; 95% CI = 0.29–0.66; $p < 0.001$), role of specialty tutor ($b = 0.61$; 95% CI = 0.25–0.97; $p = 0.001$), resident peer collaboration ($b = 0.62$; CI = 0.38–0.85; $p < 0.001$), work adapted to competence ($b = 0.63$; 95% CI = 0.44–0.83; $p < 0.001$) and accessibility supervisors ($b = 0.48$; 95% CI = 0.20–0.76; $p = 0.001$). We found no associations between the different learning climate domains and specialty satisfaction or empathy. Controlling the false discovery rate in our multiple testing left all but one of these findings intact (see role of specialty tutor and engagement in Table 4).

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Table 3. Regression coefficients and 95% confidence intervals for the associations of departments’ overall learning climate with residents’ work engagement, job and specialty satisfaction, and empathy

Outcome variable	Regression coefficient	Standard error	95% Confidence interval	p-value	FDR adjusted p-value
Engagement	0.58	0.20	0.18 – 0.98	0.004	0.016
Job satisfaction	0.80	0.16	0.48 – 1.13	<0.001	0.005
Specialty satisfaction	0.16	0.20	-0.24 – 0.55	0.438	0.545
Empathy	3.68	3.68	-3.53 – 10.89	0.317	0.423

FDR: false discovery rate

Table 4. Regression coefficients and 95% confidence intervals for the associations of the different domains of learning climate with residents' engagement, job and specialty satisfaction and empathy

Outcome variable	Regression coefficient	Standard error	95% Confidence interval	p-value	FDR adjusted p-value
Educational atmosphere					
Engagement	0.34	0.12	0.11 – 0.58	0.004	0.016
Job satisfaction	0.45	0.15	0.16 – 0.74	0.003	0.015
Specialty satisfaction	0.05	0.15	-0.24 – 0.34	0.742	0.822
Empathy	1.79	2.40	-2.91 – 6.49	0.456	0.553
Teamwork					
Engagement	0.19	0.12	-0.04 – 0.42	0.097	0.233
Job satisfaction	0.48	0.09	0.29 – 0.66	<0.001	0.005
Specialty satisfaction	0.07	0.12	-0.16 – 0.31	0.532	0.626
Empathy	3.25	2.61	-1.87 – 8.37	0.213	0.381
Role of specialty tutor					
Engagement	0.38	0.18	0.02 – 0.74	0.037	0.135
Job satisfaction	0.61	0.18	0.25 – 0.97	0.001	0.006
Specialty satisfaction	0.19	0.16	-0.12 – 0.50	0.238	0.381
Empathy	-0.47	3.04	-6.43 – 5.48	0.876	0.899
Coaching and assessment					
Engagement	0.54	0.28	-0.01 – 1.09	0.054	0.180
Job satisfaction	0.37	0.22	-0.07 – 0.80	0.099	0.233
Specialty satisfaction	0.19	0.18	-0.16 – 0.54	0.281	0.400
Empathy	6.65	3.90	-0.99 – 14.29	0.088	0.233

Formal education					
Engagement	0.37	0.12	0.14 – 0.60	0.001	0.006
Job satisfaction	0.18	0.17	-0.14 – 0.50	0.277	0.400
Specialty satisfaction	-0.15	0.13	-0.40 – 0.10	0.236	0.381
Empathy	-0.76	3.26	-7.16 – 5.63	0.815	0.881
Resident peer collaboration					
Engagement	0.25	0.21	-0.17 – 0.66	0.248	0.382
Job satisfaction	0.62	0.12	0.38 – 0.85	<0.001	0.005
Specialty satisfaction	0.15	0.15	-0.13 – 0.44	0.290	0.400
Empathy	0.56	3.37	-6.04 – 7.16	0.868	0.899
Work adapted to competence					
Engagement	0.19	0.15	-0.11 – 0.48	0.210	0.381
Job satisfaction	0.63	0.10	0.44 – 0.83	<0.001	0.005
Specialty satisfaction	0.22	0.18	-0.14 – 0.57	0.231	0.381
Empathy	1.29	2.49	-3.59 – 6.16	0.605	0.691
Accessibility supervisors					
Engagement	0.29	0.17	-0.04 – 0.62	0.083	0.233
Job satisfaction	0.48	0.14	0.20 – 0.76	0.001	0.006
Specialty satisfaction	0.20	0.21	-0.22 – 0.62	0.343	0.443
Empathy	4.51	3.73	-2.80 – 11.83	0.227	0.381
Patient sign-out					
Engagement	0.13	0.11	-0.08 – 0.34	0.222	0.381
Job satisfaction	0.21	0.11	-0.01 – 0.42	0.062	0.191
Specialty satisfaction	0.01	0.11	-0.20 – 0.22	0.929	0.929
Empathy	2.49	1.88	-1.20 – 6.18	0.186	0.381

FDR: False discovery rate

DISCUSSION

Main findings and explanations

This study provides convincing empirical evidence on the importance of the residents' learning climate for their work-related well-being. More specifically, we found that a more positively experienced learning climate was associated with higher residents' work engagement and job satisfaction scores. Learning climates does not impact residents' specialty satisfaction nor their levels of empathy.

The reported positive association of the overall learning climate with residents' work engagement is in line with previous empirical studies on (the lack of) well-being, reporting that burn-out, the counterpart of work engagement, was *negatively* associated with residents' experienced learning climate.^{22,23} Theoretically, these findings can be understood within the much referenced job demands and resources (JD-R) model which focuses on both positive and negative predictors of work-related well-being.⁴⁴⁻⁴⁶ In this JD-R model, that originated in the occupational health psychology literature, a positive predictor is referred to as a job resource, and a negative predictor as a job demand. A job resource refers to a physical, social or organizational aspect of the job that reduces job demands, is functional in achieving work goals, or stimulates personal growth, learning and development.^{44,47} Typical for a job resource is its protective potential for burnout and its stimulating potential for work engagement. Within this job demands and resources model, learning climate might be considered a job resource for residents, or more indirectly, may at least be instrumental in facilitating the uptake of other well-established job resources.⁴⁶⁻⁴⁸ More specifically, we assume that a positive and supportive learning climate facilitates for example in giving constructive feedback, coaching and creating educational moments. Previous research has identified these aspects as impactful job resources.^{44,46}

When considering the separate learning climate domains, the positive work-related

well-being construct, work engagement, seemed to be specifically influenced by two domains in particular, namely 'educational atmosphere' and 'formal education'. A positive work atmosphere, constructive communication with faculty and structured, fitting, informative education are aspects likely to positively influence the enthusiastic, positive, fulfilling work-related state of mind (work engagement) of the residents.^{47,48} This could explain the finding that these learning climate domains ('educational atmosphere' and 'formal education') were found to be associated with work engagement.

As hypothesized, we also found a positive association of the overall learning climate with job satisfaction. When looking at the learning climate domains, six out of the nine domains contributed to residents' job satisfaction ('educational atmosphere', 'teamwork', role of specialty tutor', 'resident peer collaboration', 'work adapted to competence' and 'accessibility supervisors'). When re-organizing the nine learning climate domains in three higher order facets, we may distinguish the affective, the cognitive and the instrumental facet.^{30,49} The three climate domains making up the affective facet were found to be positively associated with job satisfaction: 'educational atmosphere', 'teamwork', and 'resident peer collaboration'. We expect that these domains in the affective facet are rated on a more emotional basis and the positive association with the feeling of job satisfaction is therefore understandable. This is in line with research that found correlations between the affective facet of climate and satisfaction.⁵⁰ On the other hand, the remaining climate domains equally divided over the cognitive and instrumental facets were not all pointing into the same positive direction of residents' higher job satisfaction. To get a deeper understanding of what defines residents' satisfaction with their jobs, each domain should be explored in more detail separately. For example, it may almost seem self-evident that 'work adapted to the resident's competence level' and 'accessibility of supervisors' are positively related to job satisfaction. However, more work needs to be done to understand why 'patient sign outs', 'formal education' and residents' 'coaching and assessment' seem not to have impact on residents' satisfaction with their job.

An additional important factor that could contribute to the association of learning climate with work engagement and job satisfaction is the so-called 'hidden curriculum'. The hidden curriculum could be defined as 'a set of influences that function at the level of organisational structure and culture',⁵¹ and consists of rituals, assumptions and what is implicitly taught.⁵²⁻⁵⁴ It has been shown that well-being experiences and professionalism of learners is influenced by the hidden curriculum.^{55,56} We think that, in residency training, and especially when talking about the learning climate, this hidden curriculum plays a substantial role and has an important impact on residents' work engagement and job satisfaction.

We did not find an association of learning climate with residents' specialty satisfaction or empathy. Although, learning climate is positively associated with job satisfaction, residents' specialty satisfaction seems to be determined by other factors than the current learning climate. Specialty choice was made before entering the residency training program, and this study suggests that specialty satisfaction could be seen as (somewhat) independent from residents' current job satisfaction.

Lastly, this study could not confirm the association between positive learning climate and residents' empathy levels. The debate on whether or not physicians' empathy can be developed, and its potential facilitating factors is still ongoing.^{11,57,58} Although some argue that empathy is an inborn trait, multiple studies have indicated that empathy may be developed by targeted education.^{11,59-61} Learning climate may be useful indirectly by positively contributing to these targeted educational interventions. Overall, research should continue to focus on identifying factors other than the learning climate that can maintain or improve residents' empathy levels,¹⁷ especially given the noted decline in empathy among residents.⁴⁹

Strengths and limitations

This study adds to the existing knowledge on residents' well-being and provides evidence on the possible role of residents' learning climate in their work-

related well-being. Its importance is underpinned by the international health care accreditation standards that require hospitals to manage matters of physician well-being.⁶² In this multicenter study, we evaluated not only the association of the overall learning climate but also that of the specific learning climate domains with residents' engagement, work satisfaction and empathy. One limitation of this study is its cross-sectional design. We can only speculate about causal and non-causal influences armed with theory and existing best evidence and literature. Additionally, it is possible that there is uncontrolled confounding due to variables such as sleep deprivation and workload that could influence residents' work-related well-being and learning climate.^{63,64} A potential bias in our data collection could be due to the order of filling out the measures, the timing of the survey, and the (well-being) state and willingness of the participants to respond on a web-based survey. As this study is based on data from two specialties, namely surgery and gynaecology, in the Netherlands, we caution against extrapolating our findings beyond these settings, and encourage further investigation in other settings.

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Implications

This and earlier studies strongly suggest that the learning climate positively influences residents work-related well-being.^{22,23,45,48,65} However, there is no consensus on an appropriate overall well-being scale at this moment. It would be interesting for future research to investigate the impact of learning climate on the overall well-being of residents. Lombarts et al. also found that the learning climate could positively influence individual faculty's teaching performance.⁶⁶ This justifies program directors' focus on residents' learning climate in striving for high-quality residency training. Clearly, validly and reliably measuring the learning climate, as we did by using the D-RECT tool, is only the first step in continuous improvement. From experience in our academic medical centers and other teaching hospitals, discussing these results among residents and faculty will help in exploring, committing to

and implementing actual improvements. Hospital-wide committees for residency training, bringing together program directors as the responsible faculty for high-quality training, could further facilitate and disseminate best-practices in creating positive learning climates. Future research on other ways to improve the learning climate is recommended and may be instrumental for improving residency training programs, residents' well-being and subsequently the quality of patient care delivery.

CONCLUSION

A positive, stimulating and supportive learning climate is important in residency training. It seems to influence work engagement and job satisfaction of residents in a positive way. If these findings can be replicated and shown to be causal, they may suggest that work engagement and job satisfaction could be increased by improving the learning climate of residency training programs.

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Appendix

Table 5. Items of the global job satisfaction and global specialty satisfaction measures

Global job satisfaction

I find my present clinical work personally rewarding

Overall, I am pleased with my work

Overall, I am satisfied with my current practice

My current work situation is a major source of frustration

My work in this practice has not met my expectations

Global specialty satisfaction

My specialty no longer has the appeal to me it used to have

If I were to start my career over again, I would choose my current specialty

I would recommend my specialty to a student seeking advice

CHAPTER 7

Evaluating mind fitness training and its potential effects on surgical residents' well-being: a mixed methods pilot study

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ABSTRACT

Background Residents' well-being is essential for both the individual physician and the quality of patient care they deliver. Therefore, it is important to maintain or possibly enhance residents' well-being. We investigated (i) the influence of mind fitness training (MFT) on quality of care-related well-being characteristics: work engagement, empathy, work satisfaction and stress perception and explored (ii) residents' perceptions of MFT.

Methods A multicenter study was conducted in eight Dutch teaching hospitals, from September 2012 to February 2014, using mixed methods—that is, quantitative and qualitative approaches to data-collection and analysis. Eighty-nine surgical residents were invited to participate in pre- and post-intervention questionnaire surveys. Twenty-two residents participated in MFT and were additionally invited to evaluate the training by post-intervention interviews including open questions.

Results At baseline 22 (100%) residents in intervention group and 47 (70.2%) residents in control group, and post-intervention 20 (90.9%) residents in intervention-group and 41 (66.1%) residents in control-group completed the questionnaires. In intervention group, residents' specialty satisfaction increased by 0.23 point on 5-point Likert-scale (95% CI 0.23–0.24, $P<0.001$) while stress scores decreased by -0.94 point on 10-point scale (95% CI -1.77 to -0.12, $P=0.026$). No substantial changes were observed in control group. Participation in MFT was positively associated with residents' empathy ($b=7.22$; 95% CI 4.33–10.11; $P<0.001$) and specialty satisfaction scores ($b=0.42$; 95% CI 0.18–0.65; $P=0.001$). Residents positively evaluated mind fitness training with median scores of 6.80 for training design and 7.21 for outcome (10-point scale). Residents perceived improvement in focusing skills and reported being more aware of their own state of mind and feeling calmer and more in control.

Conclusion Mind fitness training could improve residents' empathy, specialty satisfaction, stress perception and focusing skills, and was positively received by surgical residents.

INTRODUCTION

Residents often experience a high workload, irregular working hours, limited supervisory support, and little autonomy.¹⁻³ These demands, together with a low degree of work-life balance, make residents vulnerable and raise concerns about their mental fitness.⁴⁻⁶ These concerns are amplified by high percentages of residents with symptoms of burnout and depression, stress, and anxiety.^{2,5,7-10} Residents' well-being is important for both the individual physician and the quality of patient care they deliver.^{2,11,12} Residents with a positive, fulfilling, work-related mindset, the so-called engaged residents,¹³ report making less errors.³ Likewise, residents with greater job satisfaction make fewer errors and deliver better patient care.¹⁴ More empathic physicians have more compliant and satisfied patients.^{15,16}

Thus, for the individual resident and for the quality of patient care it is important to maintain or possibly enhance residents' well-being. Strategies for doing so typically focus on either decreasing job demands or increasing job resources.¹⁷ The latter have shown to be the more effective and usable strategy as job resources are capable of buffering the impact of job demands.¹⁸

Job resources available to enhance physicians' well-being include interventions contributing to a sense of satisfaction and meaning, focusing on burnout management and on coping.^{11,19-21} Mindfulness-based training for physicians is a relatively new intervention, being investigated in multiples studies, to increase physicians' well-being. Results from a randomized controlled trial show that a mindfulness-based stress reduction intervention for health care professionals may be effective in reducing stress and increasing quality of life.²² Other studies also included the subsequent effects of improved physicians' well-being on patient care. Krassner et al. for example, described how a successful mindful communication program for primary care physicians resulted in significantly improved physician well-being and patient-centered care.²³ Furthermore, promoting mindfulness in psychotherapists in training was found to positively influence the therapeutic course and treatment results in patients.²⁴ These results are promising for physicians and their patients.

Therefore, we further investigated mind fitness training (MFT) in this study.

To the best of our knowledge, no previous study evaluated the influence of a mindfulness-based MFT program on residents using a mixed methods design. Given the need for an in-depth look at the residents' experiences, we chose a mixed methods approach to evaluate a MFT program to both quantify and qualify its consequences. More specifically, we investigated (i) the influence of a MFT program on physician' well-being characteristics that potential affect quality of care: work engagement, empathy, work satisfaction and stress perception in surgical residents and explored (ii) residents' perceptions of a MFT program and its effects.

METHODS

Setting and study population

This multicenter study was performed in eight teaching hospitals, including one academic medical center, in the Netherlands. We invited 89 surgical residents between September 2012 and February 2014 to participate in this study and used both quantitative and qualitative approaches to collect and analyze our data; this combination of approaches is referred to as 'mixed methods'. From January 2013 to April 2013, a subgroup of 22 surgical residents from two teaching hospitals (one academic and one non-academic) voluntarily participated in the MFT program. The MFT was evaluated using pre- and post-intervention residents' well-being measurements. As a control group, we invited surgical residents who did not participate in the MFT. Because of residents' rotation among residency training locations, the pre- and post-intervention control groups' participants vary. Additionally, the residents in the intervention group were invited to evaluate the MFT after completion. The first author (SSL) conducted telephonic interviews using a 22-item questionnaire. Residents consented to audio recording of the interviews. Confidentiality was assured at the beginning of the interview and residents were encouraged to speak freely.

Mind fitness training (MFT) program

The theory of mindful practice was the basis of our MFT program.^{23,25} It posits that improving attention and self-awareness can improve well-being and quality of care. Our MFT program was aimed at maintaining and enhancing residents' well-being. The intervention was designed as a 3-month training program with five sessions targeted at the 22 surgical residents. A highly experienced trainer, with extensive experience training top athletes and managers, provided all the training sessions in the MFT program. The training was given outside the hospital to reduce clinical and organizational distractions. The training was supported by didactic materials and consisted of meditation, self-awareness exercises, discussions, and its applications to work life. Residents were stimulated to share their in-hospital experiences, and to talk about difficult situations and their experienced (lack of) well-being. To further enhance mental fitness, participants were stimulated to practice the training techniques in their daily life and at work.

Measurements of residents' well-being

The effect of the MFT program on the following aspects of well-being was measured: work engagement, physician empathy, work satisfaction and stress.

For measuring residents' *work engagement*, we used the reliable and valid short version of the Utrecht Work engagement Scale (UWES-9).^{13,26} This scale contains nine items on three domains: vigor, absorption and dedication. All nine items were reported on a 7-point response scale ranging from 'never' to 'always/daily'.

Physician empathy was measured using the well-researched Jefferson Scale of Physician Empathy (JSPE).²⁷⁻³⁰ The instrument has 20 items and each item can be answered on a 7-point Likert scale (1=strongly disagree, 7= strongly agree). Translation of this measure into Dutch was carried out by three of the authors (SSL, MJMHL, OAA) following appropriate forward-back-translation procedures.^{31,32}

For measuring *work satisfaction* the global job and specialty satisfaction measure from the Physician Worklife Study was used.^{33,34} The global job satisfaction measure contains five items and the specialty job satisfaction three items. Each item could be rated on a 5-point Likert-scale (1=strongly disagree, 5=strongly agree), with higher numbers reflecting more satisfaction. Translation of this measure into Dutch was also carried out by the authors using the robust translation protocol.³²

For the intervention group we additionally measured the experience of *stress* pre- and post-intervention. To measure stress, we asked the residents to rate their stress perception on a 1 to 10 scale ranging from 'no stress' to 'a lot of stress'.

Residents' perception of the MFT program

To evaluate residents' perception of the MFT program, we translated and developed an 18 item- questionnaire based on the Training Evaluation Inventory.^{32,35} All included questions were amply discussed in and approved by the research team. The questionnaire covered both training *outcome* (8 items) and training *design* (10 items). During a 10 to 15 minutes telephone interview, residents were asked to respond to the 18-item questions on a scale ranging from 1 ('totally disagree') to 10 ('totally agree'). Interviews concluded with 4 open questions inquiring about residents' experience of the training and their opinion of the mindfulness concept. (See appendix document A1 for the items and domains of the Training Evaluation Inventory).

Data analyses

To describe the study participants and variables we used descriptive statistics such as means, standard deviations and medians. We also calculated residents' mean scores on engagement, empathy, job and specialty satisfaction, and stress at baseline and post-intervention for the intervention and control groups of residents separately. To test the change in those scores from the pre- to post-intervention

periods, we used generalized estimating equations (GEE) to fit a multilevel growth model (indexed by the two measurement time points) to the repeated (pre- and post-intervention) outcome measures for the intervention and control groups (stress for the intervention group only). A positive (or negative) change from the pre- to post-intervention time implied an increase (or decrease) in the outcome. Additionally, to evaluate the influence of the MFT program on the residents' engagement, empathy, and job and specialty satisfaction, we also used GEE to fit adjusted linear models that regressed the post-intervention measures on the indicator of MFT, adjusting for baseline intervention and clustering of evaluations within hospital departments. We further adjusted for residents' gender and type of teaching hospital. As year of residency was found not to influence our regressions, we ultimately left it out of further models to maintain efficiency. We report the results as regression coefficients (*b*) and their 95% confidence intervals (CI) and *P*-values where applicable. The quantitative analyses were performed using the statistical software IBM SPSS Statistics version 21.0.

To explore the residents' perceptions, we first quantitatively evaluated the MFT by calculating the means and medians of the residents' evaluation scores per item and per domain for both the training outcome and design. To further explore residents' perceptions we analyzed the free text answers given in response to the open questions. The interviews were recorded, transcribed verbatim, and coded by the first author (SSL) using qualitative data analysis software MaxQDA version 11. Analysis was performed using the template analysis method.³⁶ The template was based on the four 'levels' of training evaluation criteria from Kirkpatrick's model.³⁷ A second researcher (IAS) coded two interviews to ensure consistency of coding. Differences in coding were discussed until agreement was reached.

RESULTS

Residents' characteristics

At baseline 22 (100%) invited residents in the intervention group, and 47 from the 67 (70.2%) invited residents in the control group responded to the online invitation. Post-intervention, 20 (90.9%) invited residents in the intervention group filled out the questionnaires, as did 41 from the 62 (66.1%) invited residents in the control group. In the intervention group, 21 residents (95,5%) responded to the interviews and one resident did not complete the training because of the residents' difficulty adhering to the training program. In table 1, the characteristics of the intervention group and control groups at baseline (T0) and post-intervention (T1) are shown.

Table 1. Characteristics of the intervention and control groups at baseline (T0) and post-intervention (T1).

Variable		Intervention group T0 (N=22) N (%)	Control group T0 (N=47) N (%)	P-value	Intervention group T1 (N=20) N (%)	Control group T1 (N=41) N (%)	P-value
Teaching hospital	Academic	13 (59.1)	10 (21.3)	0.003	13 (65.0)	0 (0)	<0.001
	Non Academic	9 (40.9)	37 (78.7)		7 (35.0)	41 (100)	
Gender	Male	15 (68.2)	26 (55.3)	0.258	14 (70.0)	22 (53.7)	0.174
	Female	7 (31.8)	20 (42.6)		6 (30.0)	19 (46.3)	
	Missing	-	1 (2.1)		-	-	
Year of residency	1-3 years	15 (68.2)	29 (61.7)	0.447	13 (65.0)	28 (68.3)	0.509
	4-6 years	7 (31.8)	17 (36.2)		7 (35.0)	13 (31.7)	
	Missing	-	1 (2.1)		-	-	

Residents' outcomes: engagement, empathy, work satisfaction and stress

Residents' scores on work engagement, physician empathy, job and specialty satisfaction and stress in both the intervention and control group at baseline (T0) and post-intervention (T1) are described in table 2. We found that among residents participating in the MFT program specialty satisfaction scores increased by 0.23 point (95% CI 0.23 – 0.24, $P < 0.001$) while stress scores decreased by -0.94 point (95% CI -1.77 – -0.12, $P = 0.026$). No substantial changes were observed in the control group. Table 3 shows the results of the adjusted regression analyses for the influence of the MFT program on residents' engagement, empathy, job and specialty satisfaction. These results show that residents' empathy ($b = 7.22$; 95% CI 4.33 – 10.11; $P < 0.001$) and specialty satisfaction ($b = 0.42$; 95% CI 0.18 – 0.65; $P = 0.001$) scores are positively associated with the MFT program.

Table 2. Residents' engagement, empathy, work satisfaction and stress scores at baseline (T0) and post-intervention (T1), and their changes from the baseline to post-intervention period.

Outcome	Instrument (scale)	Baseline outcome (T0) scores		Post-intervention outcome (T1) scores	
		Intervention group (N=22)	Control group (N=47)	Intervention group (N=20)	Control group (N=41)
		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Engagement	UWES (0-6)	4.62 (0.55)	4.42 (0.74)	4.64 (0.66)	4.43 (0.82)
Empathy	JSPE (20-140)	111.77 (11.52)	110.35 (10.91)	113.60 (12.93)	110.80 (12.35)
Satisfaction	Job (1-5)	4.15 (0.67)	4.05 (0.57)	4.11 (0.69)	4.05 (0.58)
	Specialty (1-5)	4.06 (0.89)	3.99 (0.73)	4.27 (0.70)	3.99 (0.85)
Stress	Stress (1-10)	5.83 (1.76)	NA	4.93 (1.75)	NA

Outcome difference (T1 – T0) scores					
		Intervention group (N=20)		Control group (N=16 [#])	
		Change from baseline to post-intervention		Change from baseline to post-intervention	
		(95% CI)	P-value	(95% CI)	P-value
Engagement	UWES (0-6)	0.03 (-0.34 – 0.40)	0.860	-0.17 (-0.57 – 0.24)	0.423
Empathy	JSPE (20-140)	2.30 (-1.15 – 5.75)	0.191	-0.88 (-5.23 – 3.48)	0.694
Satisfaction	Job (1-5)	-0.01 (-0.47 – 0.45)	0.966	-0.16 (-0.36 – 0.04)	0.113
	Specialty (1-5)	0.23 (0.23 – 0.24)	<0.001	-0.15 (-0.30 – 0.01)	0.062
Stress	Stress (1-10)	-0.94 (-1.77 – -0.12)	0.026	NA	

[#]Number of residents in the control group that filled up both baseline and post-intervention measurements

NA: Not available, SE = Standard Error, CI = Confidence interval

Table 3. Regression coefficients and 95% confidence intervals for the effects of MFT on residents' engagement, empathy and work satisfaction scores post-intervention, adjusted for baseline engagement, empathy and work satisfaction scores and other covariates.

Outcome	Regression coefficient	95% confidence interval	Standard error	P-value
Engagement	-0.08	-0.50 – 0.34	0.215	0.698
Empathy	7.22	4.33 – 10.11	1.476	<0.001
Job satisfaction	<0.01	-0.23 – 0.23	0.118	0.995
Specialty satisfaction	0.42	0.18 – 0.65	0.121	<0.001

Residents' perception of the MFT

Table 4 describes the scores of the Training Evaluation Inventory per item and for the overall training outcome and overall training design. The results show an overall training outcome median score of 7.21 with a minimum score of 4.50 and a maximum score of 9.25. The median score for overall training design was 6.80 with a minimum score of 3.90 and a maximum score of 8.40. The statements 'I find it good that the subject mental fitness was discussed' and 'The learning atmosphere was agreeable' were rated highest with a median score of 8.00 in the training outcome domain.

Table 4. Residents' training evaluations scores per item and per domain.

Evaluation domain and items	Mean (SD)	Median (min-max)
Training Outcome: overall	6.94 (1.30)	7.21 (4.50-9.25)
1. Overall, I liked the training	7.55 (0.76)	7.50 (6.00-9.00)
2. The learning atmosphere was agreeable	7.85 (0.75)	8.00 (6.00-9.00)
3. I find the training useful for my job	6.35 (1.47)	6.75 (4.00-9.00)
4. Investing time in this training was useful	6.50 (1.73)	7.00 (3.00-10.00)
5. I derive personal use from this training	6.45 (2.21)	7.00 (2.00-10.00)
6. I will apply what I learned to my day-to-day work	6.55 (1.67)	6.50 (3.00-10.00)
7. I find it good that the subject mental fitness was discussed	8.18 (1.50)	8.00 (3.00-10.00)
8. I would recommend this training to my colleagues	6.10 (2.10)	6.50 (2.00-10.00)
Training Design: overall	6.62 (1.13)	6.80 (3.90-8.40)
9. Problematic situations from day-to-day work were presented and I had to find out through which abilities/knowledge the situation could have been improved	5.23 (1.94)	6.00 (1.00-8.00)
10. The trainer invited me to bring in my own knowledge and experiences from my day-to-day work regarding mental fitness	7.40 (1.27)	7.50 (4.00-9.00)

11. Contents were illustrated with concrete examples	6.50 (1.70)	7.00 (2.00-9.00)
12. I was aware of the learning objectives	7.15 (1.69)	7.00 (2.00-10.00)
13. The learning objectives were achieved	6.80 (1.54)	7.00 (3.00-9.00)
14. I was able to practice what I had learned in the training	6.95 (0.94)	7.00 (4.00-8.00)
15. In the training I received feedback on my behavior/performance	6.38 (1.60)	7.00 (3.00-8.00)
16. I was able to implement the feedback and work on my behavior/performance	6.50 (1.67)	7.00 (3.00-9.00)
17. I had the opportunity to reflect on what I had learned (during the training)	7.00 (1.77)	7.50 (1.00-9.00)
18. It became clear to me how I can apply the themes covered in day-to-day work	6.33 (2.15)	6.75 (3.00-10.00)

Qualitative analysis of the 21 training evaluation interviews demonstrates that after a MFT all four levels of Kirkpatrick’s training criteria could be met.³⁷ Overall participants’ *reactions* (Kirkpatrick level one) are positive from ‘good’, ‘innovative’, ‘interesting’ to ‘useful’. Some participants however mentioned that the meditation exercise in the training was ‘difficult to persevere’ and that the training ‘probably is more effective for residents in need’. At the second level, *learning*, residents report they learned to understand and do appreciate the principles of mindfulness. They mention the created awareness of the importance of well-being, the influence MFT could have on their well-being levels, and the exercises they could fall back to.

Relating to the third level of training criteria, impact on *behavior*, residents mainly report the use of the practical tips as short breathing exercises and visualization, which are applicable in work life. They use these exercises in stressful work situations, before starting an operation and when they feel restless or nervous. Some of the residents use meditation exercises at home. At the fourth level, *results*, it is notable that residents report that they feel more at ease, experience the feeling of more control and better focusing when applying the exercises learned in the training.

One resident mentioned that his partner experienced more calmness when the resident used the techniques from the MFT. Additionally some residents expressed to recommend and propagandize a Mind Fitness Training program to colleagues.

DISCUSSION

Main findings

Residents' perceived empathy scores, specialty satisfaction, stress levels and focusing skills improved after participating in a MFT program. Residents positively rated the MFT program, and in terms of changed behavior they mainly integrated short practical exercises in their daily practice.

Explanation and interpretation of findings

The results relating to our first objective—the influence of a MFT program on residents' well-being—show positive associations of empathy scores and specialty satisfaction scores with MFT. There was also a decrease in stress perception *after* the MFT program. This is in line with the findings of Krasner et al. describing a significant increase on empathy scores after a mindful communication training,²³ and of Shapiro et al. reporting a significant stress reduction after a mindfulness-based stress reduction program.²² These findings underline the importance and potential of residents' well-being training programs. Stress reduction after a mindfulness-based training program might be explained by participants' better regulation of their emotions and grown awareness of their own body.³⁸ This corresponds with the results from our qualitative analyses wherein residents describe greater perceived awareness of their own state of mind, feeling calmer, and more in control.

The findings relating to our second objective—residents perceptions of the MFT program—show an overall positive evaluation of the training with high scores for both training design (median 6.80) and training outcome (median 7.21). The item with the lowest rating ‘Problematic situations from day-to-day work were presented and I had to find out through which abilities/knowledge the situation could have been improved’ (median 6.00) seems to indicate that the current MFT program could be better adapted to fit the specific needs of the surgical residents. This is supported by the suggestions for improvement as formulated by the residents, i.e. the quote “the training could be more focused on tools for the surgical daily practice”. Within the training outcome domain, in particular, residents’ positive reception of explicitly addressing mental fitness as part of their residency training (median 8.00) underpins the potential benefits of resident well-being training programs and residents’ well-being as has been previously described in other publications on physician well-being.^{11,39} In the qualitative analyses of the MFT evaluation we found that the training could have an impact on different training levels of Kirkpatrick,³⁷ as residents reported increased awareness of relevance of well-being, the use of the learned exercises in stressful situations, and improvement in their focusing skills. The overall reported positive changes in residents’ well-being after the MFT in the quantitative and qualitative parts of the study are encouraging for large scale follow-up research.

7

Strengths and limitations

This mixed methods study is the first to evaluate a mindfulness-based training for surgical residents specifically. It partly meets the need for further research noticed by Lefebvre to investigate the interest for resident well-being programs among various residents and the efficacy of the various components of well-being curricula.³⁹ In investigating a mindfulness based training program, we used a more holistic view by adopting a mixed methods design, enabling us to use the strengths of both quantitative and qualitative approaches.^{40,41} The high response rate (66%-100%) in this study represents another strength.

The major limitations of this pilot study are its small sample size and the voluntary training participation of the residents. All participants were fit residents, which could be considered a limitation. As illustrated with the narrative ‘it might be better to have a group with residents in need’, a training program might yield even more for less fit residents. In addition, a limitation is the use of an experienced trainer who provided the training sessions. Standardization of the training is difficult and the effect of the trainer is probably considerable and cannot be measured or discounted in this study.

Implications

Our findings together with the existing literature indicate that a mindfulness-based training may have a positive effect on residents’ well-being. Additionally, a mindfulness-based training is probably most effective when tailored to meet the specific needs of surgical residents. Organizing a MFT program is not possible in every residency training setting. Fortunately, other ways to improve well-being are available and also known to be effective. For example, (outdoor) exercises as walking or running have been shown to decrease stress and improve mood,^{42,43} and yoga and pilates exercises appeared to increase well-being, mood states and improve self-reported stress-management.^{44,45} Empathy could be enhanced by educational interventions like creative arts, writing, communication skills training and reflective practice.⁴⁶⁻⁴⁸ Although personal preferences and training setting will be extremely important in committing to life style changes, such as adopting regular exercise or meditation practices, future research can investigate the most effective way to increase residents’ well-being. Although cost-benefit analysis for MFT is not yet available, to our knowledge, we assume that the costs of both research on well-being interventions and providing (adapted) residents well-being programs will be worthwhile, given its profound effects on physicians’ health and demonstrated positive impact on patients.^{2,11,12,49}

CONCLUSION

The findings of this study suggest that a mindfulness-based training program could be instrumental in improving surgical residents' empathy, specialty satisfaction, stress perception and focusing skills. Overall, residents are positive about mind fitness training, thus justifying the exploration of implementing such a program in residency training.

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Appendix

Table 5. Domains and items of the Training Evaluation Inventory

Training outcome domains (Scale: 1 -totally disagree- to 10 -totally agree-)	
<i>Subjective enjoyment</i>	
1	Overall, I liked the training
2	The learning atmosphere was agreeable
<i>Perceived usefulness</i>	
3	I find the training useful for my job
4	Investing time in this training was useful
5	I derive personal use from this training
<i>Attitude towards the training</i>	
6	I will apply what I learned to my day-to-day work
7	I find it good that the subject mental fitness was discussed
8	I would recommend this training to my colleagues

Training design domains (Scale: 1 -totally disagree- to 10 -totally agree-)	
<i>Problem-based-learning</i>	
9	Problematic situations from day-to-day work were presented and I had to find out through which abilities/knowledge the situation could have been improved
<i>Activation</i>	
10	The trainer invited me to bring in my own knowledge and experiences from my day-to-day work regarding mental fitness
<i>Demonstration</i>	
11	Contents were illustrated with concrete examples
12	I was aware of the learning subjects
13	The learning objectives were achieved
<i>Application</i>	
14	I was able to practice what I had learned in the training

-
- 15 In the training I received feedback on my behavior/my performance
 - 16 I was able to implement the feedback and work on my behavior/my performance in the training

Integration

- 17 I had the opportunity to reflect on what I had learned
 - 18 It became clear to me how I can apply the themes covered in day-to-day work
-

Open questions

- 1 How did you experience the attention (mindfulness) training? Do you practice at home?
 - 2 What do you think of the concept/the ideas of mindfulness after completing the training?
 - 3 What do you think are the strong points of the training?
 - 4 What do you think are suggestions for improvement for the training?
-

CHAPTER 8

General Discussion

OVERVIEW OF MAIN FINDINGS

The overall aim of this thesis was to investigate **residents' work-related well-being and its influencing factors**. We aimed to evaluate, clarify, and improve the work-related well-being of residents in training. In the introduction, we discussed the importance of residents' well-being for the individual physician and for the quality of patient care. In this chapter, we will discuss the main findings of our studies investigating residents' work-related well-being. After placing these findings in context, we will describe the strengths and limitations of this thesis, and we will conclude with implications and recommendations for future research, practice and policy.

We started our research with describing the growing concerns about residents' work-related well-being based on national and international literature (**Chapter 2**). These concerns include high percentages of residents suffering from burn-out, depression and high levels of experienced stress and the consequences such as loss of empathy, suboptimal care delivery and an increased risk of medical errors. When exploring residents' perceptions of their well-being in relation to their professional life, we found that two dominant overarching experiences - autonomy and effort-reward balance - influence residents' well-being (**Chapter 3**). The relevance of physicians' autonomy for their well-being was confirmed in a follow-up study where we found autonomy to be associated with higher work-engagement (**Chapter 4**). Residents' opportunities to learn and develop were also positively associated with work-engagement. Surprisingly, work-engagement was not associated with patient care experiences; that is, no effects of work engagement were observed in the patients' evaluations of physicians' care behaviours.

Residents participating in our survey studies showed relatively high work-engagement scores, compared to the general Dutch working population. Their ratings of empathy, however, tended to be on the low side when compared to empathy levels of physicians in other studies. Additionally, our studies revealed that both residents' work-engagement and empathy levels were positively associated with their perceived levels of faculty's teaching performance (**Chapter 5**).

Next, we investigated the learning climate of residency training programs, and found positive associations between residents' perception of the learning climate and both work-engagement and job-satisfaction (**Chapter 6**). Lastly, we found that after following a Mind Fitness Training program, residents reported lower stress levels, higher specialty satisfaction and empathy scores. They also experienced an improvement in focusing skills, felt calmer and more in control. Overall, residents positively evaluated the training (**Chapter 7**).

The factors that influence residents' well-being above described, (autonomy, efforts-rewards balance, opportunities to learn and develop, learning climate, mind fitness training) could be target points for interventions to maintain or enhance residents' work-related well-being.

FINDINGS IN CONTEXT

In modern health care, residents face various challenges within the medical profession as well as in residency training, which could impact their well-being. We will therefore discuss our research findings on residents' work-related well-being from different views: from a professional, educational and psychological perspective.

We will start with the professional perspective because residents are physicians and as such members of a world-wide professional medical community. Their profession and the developments herein seem to play a big role in experiencing well-being. Next, because of our focus on residents performing in a training and clinical context simultaneously, we describe our findings from an educational perspective. Finally, given our focus on factors that influence well-being, we use the Job Demands and Resources model (JD-R model) and psychological theories. Hence, the occupational health psychological perspective is the last perspective to our findings.

The professional perspective

All physicians have pledged to the same Hippocratic oath to commit to the values and behaviours of the medical profession.^{1,2} Professional performance of physicians is complex, but could be defined as 'all the actions or processes in performing work tasks, while keeping up to these values and behaviours'.³ The medical profession is constantly developing and changing and physicians nowadays experience more external control, rationalization using protocols, increased demands for accountability, growing bureaucracy, more administrative tasks and a decline in autonomy and real patient contact.⁴⁻⁷ These aspects unfortunately have led to declining work-satisfaction and well-being among physicians. We will discuss the current thesis findings on physicians' well-being from a professional perspective.

Autonomy

According to Mackor, autonomy is one of the essential characteristics of a professional and of a profession.⁸ Of course, professionals must conform to the values and predefined behaviours of their profession but additionally they need autonomy to make decisions and perform optimally. Professionals need space to interpret and weigh carefully the knowledge and information to apply in a specific, concrete situation. Additionally, they have a confidential relationship with their patient or client, which is challenged by the interference of outsiders.⁸ The developments in modern health care (e.g. protocolled patient care, demands on accountability, 'top-down' bureaucratisation) threaten to (further) decrease the autonomy of professionals and the profession. Degeling describes 'responsible autonomy' as a possible solution and an organising principle in health care.⁹ This refers to professionals' reflection on the given trust physicians receive, which would naturally be answered by the wish to show accountability for one's actions. The feeling of responsibility and the wish to reflect is based on the values of the profession and could be used by connecting protocols and rules through transparency.⁹⁻¹¹

We found that residents experience autonomy as an essential factor in feeling well. In our research residents noted that the experienced autonomy in their various professional roles as caregivers and learners is important in experiencing well-being. They feel, for example, the value of getting the opportunity to make treatment decisions with their patients and the freedom to determine their personal learning goals. Additionally, autonomy in residents' private life, for example scheduling spare time, also played a role in their well-being. The importance of autonomy for employees has been underlined by various occupational health psychology studies. Autonomy was found to be important for intrinsic motivation and work-related well-being.¹²⁻¹⁴ In medical care, a recent review from Raj showed that besides autonomy, residents' competence and social relatedness are aspects found to be positively associated with resident well-being.¹⁵ Residents additionally identified their well-being as affecting relatedness, competence and autonomy. Hence, residents seem to require well-being to be able to optimally interact with patients and colleagues, make the most adequate decisions, feel motivated and perform at their best.¹⁵

Work-engagement

Research in the medical context also showed that work-related well-being and work engagement are important for the professional performance of physicians.¹⁶⁻¹⁹ Work engagement is associated with more adequate patient safety behaviours and fewer medical errors.^{17,20} Additionally, research suggests that work engagement could potentially enhance work ability.^{18,21} The mean work engagement score among our researched residents was higher than the mean score of the general Dutch working population but is still in the average range.²² This means, there is room for growth. Enhancing work engagement is of interest for the individual resident and for patient care as higher engagement is from earlier research known to be associated with better performance and higher quality of care.^{16,18,19,23} However, in our study on patients' experiences, physicians with varying work engagement levels perform equally well in patients'

eyes. In this study, we measured the performance of physicians in terms of their care behaviours and interactions. Since residents receive extensive training in professional interpersonal behaviours towards patients during their post-graduate education this may act as a buffer in upholding standards on behaviours towards patients even when experiencing lower levels of work-engagement.

Motivation

From a professional view, physicians' motivation is important for their performance. Both intrinsic and extrinsic motivation could stimulate physicians, however actions based on intrinsic motivation are extremely important for professional performance and have shown to be more successful than actions based on extrinsic motivation.²⁴ Pink describes autonomy, having a purpose in work and experiencing progress (mastery) as the three pillars for intrinsic motivation.²⁵ Unfortunately, the changes in the medical profession - as there are the growing bureaucracy, the increase in protocols and decline in autonomy -, undermine the expression of intrinsic motivation. We know that intrinsic motivation when asking for feedback leads to more performance improvement than external control or financial rewards.²⁴ This encourages formative performance measurements that stimulate intrinsic motivation for learning and performance improvement instead of external quality control.²⁶ This is also in line with the key aspects of good professional performance: striving for excellence, humanistic practice and showing accountability for ones actions.²⁷ Stimulating intrinsic motivation could potentially be effective for physicians' performance growth, and may additionally enhance their engagement and well-being. According to Ryan and Deci (2000) whose research was guided by the Self-Determination Theory, we are proactive and engaged or passive and alienated as a result of the social conditions in which we function and develop.¹⁴ They found that besides autonomy and competence, relatedness is also important in enhancing intrinsic motivation and additionally well-being.¹⁴

The educational perspective

As described in the general introduction of this thesis the medical curriculum has recently changed to competency-based training models. In general, the new frameworks refer to specific knowledge, skills and abilities that are expected from residents. The Canadian Medical Education Directions for Specialists (CanMEDS) framework, adopted for Dutch residency training - and physicians' life-long learning -, defines its expectations for all physicians in seven professional roles (medical expert, communicator, collaborator, leader, health advocate, scholar and professional).²⁸ The aim is to create an optimal residency training with high quality education that delivers physicians fit to serve the needs of modern medicine and society.²⁹ In actual practice, it is not possible to express the content of physicians' work in just seven competencies (or 28 sub-competencies). Physicians already report feeling overwhelmed by the number of administrative requirements, checklists and online assessments that seem to underappreciate the complexity of practice.^{30,31} This thinking in competences and instrumental approach of professional development may additionally undermine training for real professionalism and seems to discourage both faculty and trainees.³¹⁻³³ It allows residents to hide behind schemes and regulations, while we would like to motivate residents to adopt their professional responsibilities and invest in their expertise and skills.^{31,33} From an educational perspective it is important to exceed this thinking and teaching in competences for residents' learning and professional development and also for their well-being. We found faculty teachers and the learning climate of residency training to be key factors herein.

Faculty teachers

Educating residents is the responsibility of all faculty teachers who work in a training department. The individual teaching performance of faculty is crucial for the residents' learning experience and daily work and ultimately for their performance.

A key aspect of good professional performance is humanistic practice.²⁷ This is not a competency explicitly adopted in the competency-based training model. Physician empathy and compassion are two expressions of humanistic practice and are both associated with better quality of patient care.³⁴⁻³⁶ Unfortunately, there is a detected decline in empathy among doctors during medical school and residency training.^{37,38} For residents it is essential to learn and develop good humanistic practice behaviours and skills and their faculty could play an important role. We found a positive relation of residents' empathy, and engagement, with their faculty's teaching performance. Good faculty teachers might be better in ensuring enthusiasm, knowledge and confidence,^{39,40} and consequently enhancing residents' empathy and engagement. Additionally, more engaged and empathetic residents seem to rate their faculty more positively. Therefore, good faculty teachers are crucial as they could bring positive feedback and feed-forward cycles in residency training.

Learning climate of residency training

Another essential element in residency training is the learning climate. The learning climate includes the formal and informal aspects of education and could be measured with nine domains using the Dutch Residency Climate Test (D-RECT).⁴¹⁻⁴³ Our results showed that higher rated learning climate in residency training was positively associated with work engagement and job satisfaction. This is in line with previous studies on (the lack of) well-being, reporting that burn-out, the counterpart of work engagement, was negatively associated with residents' experienced learning climate.^{44,45}

Residents' work engagement seemed to be specifically influenced by two learning climate domains in particular, namely 'educational atmosphere' and 'formal education'. These domains contain specific educational aspects of the learning climate and might imply that residents consider themselves more as learners than as full practicing physicians. This could explain the finding that these more learner-

centred learning climate domains have a motivational potential and were found to be associated with their work engagement. One cause of residents considering themselves more as learners might be found in the competency-based training models as these focus on education and signing off development.^{31,32}

Job satisfaction appeared to be most predicted by the learning climate domains: 'educational atmosphere', 'teamwork', 'role of specialty tutor', 'resident peer collaboration', 'work adapted to residents' competence' and 'accessibility supervisors'. Globally these are educational or collaboration aspects that are positively associated with residents' job satisfaction. This is in line with the recent review by Raj describing that aspects such as opportunities to learn, pursuit and achievement of goals, increased confidence and sense of increasing mastery, positive feedback, and positive colleague relationships are associated with greater well-being.¹⁵ In our interview study (Chapter 3) residents also noticed the importance of being assigned the appropriate responsibilities for feeling well during work. Added importance was given to opportunities to learn and develop. In modern residency training being assigned to appropriate tasks and responsibilities is addressed by introducing the entrustable professional activity (EPA) concept.⁴⁶⁻⁴⁸ This concept allows supervisors to make competence-based decisions about tasks and responsibilities that can be entrusted to residents. This could be an extra source for experiencing autonomy by residents. In addition to autonomy in medical practice, residents' reported that it also was crucial to feel sufficient autonomy as learners. This means that they would like to have something to say about their personal learning goals, learning strategies and training schedule. The current personalization of residency training additionally allows for more autonomy for residents as learners. In the context of self-directed learning, this is also relevant. Active learners who have the opportunities to self-direct their own learning process, do this with intrinsic motives, seem to experience better well-being.^{39,40} As discussed earlier, intrinsic motivation can also lead to better learning and performance improvement than extrinsic motivation.

Faculty teachers' supervisory and teaching skills and the experienced learning climate are crucial in residents learning and development of good humanistic practice, as well as in improving residents' well-being. Lombarts et al. found that learning climate could positively influence individual faculty's teaching performance.⁴⁹ This underscores the value of focussing on the residency learning climate in striving for high-quality residency training. Hospital-wide coordinating educational committees could organize programs to create well-fitted knowledge and training sessions, and the hospital organizations have a role in creating enough time for patient contact, learning opportunities, administration and coping with difficult situations.

The occupational health psychological perspective

Job Demands and Resources model

In occupational psychology, the Job Demands and Resources model (JD-R model) is a frequently used and evidence-based model to describe the associations of work characteristics with work-related well-being and performance.¹² This model categorizes the predictors of well-being in two groups: job demands and job resources, and focuses on both positive and negative work-related well-being. In the light of the JD-R model we will discuss some of our findings. We already described positive associations of the learning climate in residency training with work engagement and job satisfaction. Within the job demands and resources model, learning climate might be considered as a job resource for residents.⁵⁰ However, we think that the learning climate acts more indirectly, and may at least be instrumental in facilitating the uptake of other well-established job resources. More specifically, we assume that a positive and supportive learning climate can facilitate, for example, giving constructive feedback, as well as coaching or creating educational moments.^{12,50,51}

Factors influencing residents' work-related well-being noticed by our study participants align with literature on the job demands and resources model. Residents described that receiving a compliment from a supervisor or feeling the energy from performing their job well makes them able to handle the busy outpatient clinic day or even a negative event. This is in line with literature showing that resources are capable of buffering the impact of job demands.^{12,52} The balance between the experienced efforts and rewards was found to be essential for residents' experienced well-being in our study and is in accordance with previous work engagement and burnout research.^{12,13} Jennings et al. reported this balance as important for residents' well-being.⁵³ In this light a positive balance between efforts and rewards might be seen as a job resource and a negative balance as a job demand. The personal character of experiencing something as a job resource or demand is in line with the work of Van den Berg et al.⁵⁴

Xanthopoulou additionally described that personal resources play a significant role in perceptions of stress and experiencing well-being and added this to the JD-R model.^{55,56} This resonates with our residents' experiences describing that intrinsic motivation and optimism positively influence the felt energy and thereby the experienced well-being. Another possibly important personal characteristic which could influence the experienced well-being is 'grit'. Grit is a positive, non-cognitive, stable trait and could be defined as 'perseverance and passion for long term goals'.⁵⁷ Literature showed that grit is predictive of higher psychological well-being,⁵⁸ and might therefore be an interesting point for future research.

Interventions and resources to enhance well-being

There are various resources and interventions available to enhance well-being of residents.^{59,60} Mindfulness training was found to have a positive impact on experienced well-being.⁶¹⁻⁶³ In our intervention study we confirmed that surgical residents' perceived empathy scores, specialty satisfaction, and stress levels

improved after participating in a Mind Fitness Training (MFT) program. Residents positively rated the MFT program, experienced improved focusing skills and felt more control. In terms of changed behaviour they mainly integrated short practical exercises in their daily practice.

Another promising training to improve well-being is heart rate variability training as described for example by the Heartmath institute.⁶⁴⁻⁶⁶ This training involves the use of biofeedback to control and visualize heart rate variability. Heart rate variability is the variation in the time interval between the heart beats and is largely under control of the autonomic nervous system. This heart rate variability could be seen as an index of self-regulatory strength and is positively associated with experienced well-being.⁶⁷⁻⁶⁹

Research showed that perceived social support via family, friends, or support groups from physicians is associated with decreased emotional exhaustion, lower levels of depersonalization and increased personal accomplishment.⁷⁰⁻⁷² Our residents in the interview study (chapter 3) also noticed feeling supported by and deriving energy from family, friends and colleagues.

Raj described in a review study that sleep, physical activity, and time spent in nature is associated with greater well-being or less burnout.¹⁵ The balance between energy expenditure and energy recovery seems to play a significant role in well-being and performance.^{73,74} Health complaints and exhaustion significantly decrease during vacation and after vacation less expenditure is needed to fulfil the daily work chores.⁷³ It would be interesting to gain more knowledge about the optimal balance between these two components for residents in training.

STRENGTHS AND LIMITATIONS

The strengths and limitations inherent to the methods and designs of the various studies are discussed in the individual chapters. In addition, we will address here the

more general strengths and limitations. As underpinned by research and widespread (social) media coverage, this thesis emphasizes an extremely relevant subject: residents' work-related well-being. We feel the relevance and practical value of this research is one of the strengths. The collaboration within a multi-disciplinary research team has contributed to the quality of this thesis. The variation in research methods, in particular the creative use of both quantitative and qualitative (and mixed) methods, enabled us to deepen our understanding of residents' work-related well-being and allowed us to address different types of research questions. We could sample a wide range of residents' experiences from different specialties in academic and non-academic teaching hospitals nationally, resulting in a good impression of residents' well-being and the influencing factors. This information provided about residents' well-being gives us suggestions for improvement. The multicentre study design and participation and the high response rates are other strengths of this thesis. This contributes to the generalization and transferability of the findings.

Nonetheless, caution must be taken for extrapolating our findings beyond the used specialties and generalization to settings outside the Netherlands. The Dutch residency training setting has typical cultural characteristics, which could be different from other countries. To explore other potential influences, research in other settings is essential. Another limitation could be that the subject of this thesis, residents' work-related well-being, is a broad and subjective construct. Well-being is an experience and can only be described by the person experiencing it. Additionally, because of the broad scope of well-being we had to set parameters for measurement and evaluation. There is not one appropriate 'well-being scale' and therefore we made choices for measuring existing constructs in our quantitative studies. Future research could investigate other relevant well-being constructs that we did not explore in this thesis. Another limitation is the cross-sectional design of some of our studies. This makes us only able to speculate on influences based on theory and findings and precludes determinations of causal relations.

IMPLICATIONS FOR FUTURE RESEARCH

To optimize residency training and residents' well-being, the learning climate in residency training and the supervisory faculty play an essential role. Validly and reliably measuring the learning climate and faculty's teaching performance is only the first step in continuous improvement. Discussing these results among residents and faculty will help in exploring, committing to and implementing actual improvements. Hospital-wide committees for residency training, bringing together program directors as the responsible faculty for high-quality training, could further facilitate and disseminate best-practices in creating positive learning climates and improving teaching skills of faculty. Future research on other ways to improve the learning climate is recommended and may be instrumental for improving residency training programs, residents' well-being and subsequently the quality of patient care delivery.^{53,75}

In this thesis various well-being constructs and measurements were used. As already said in the limitations: there is not one appropriate well-being scale covering the holistic view of well-being. Consensus on an appropriate well-being scale would be of interest, as this would enable us to make better comparisons and draw better conclusions. Developing and validating such a holistic well-being scale for residents might therefore be key in future research.

Talking about safeguarding and improving residents' well-being, it seems helpful to offer or make residents aware of the resources that stabilize or enhance their well-being and increase resilience.^{53,60,76,77} Interesting options to focus on could include: how to balance the efforts and rewards, the energy expenditure and energy recovery or doing mindfulness training as this seems to have a positive impact on the experienced well-being.^{61,78,79} Another promising option is a well-being program based on heart rate variability training as this is associated with higher well-being and makes improvement visible.⁶⁶⁻⁶⁸ There are also some studies describing that music could improve well-being and physicians' performance, in particular surgeons' performance.^{80,81}

When more holistically exploring well-being, the 'blue zones' concept could be of interest for future research. The 'blue zones' are the places in the world where the people live longest in good health and well-being.⁸² Based on the common lifestyle characteristics of the people in these 'blue zones', Buettner describes in his book nine lessons learned, including i.e. move naturally, know your purpose, engage in spirituality or religion, put your family and loved ones first, and live in social networks that support healthy behaviours.⁸³ As the best lessons, resources or interventions are probably based on personal preferences and characteristics, there is a role for residents to help and explore which resources could increase their resilience and their well-being best. Further research on the most effective interventions for residents to increase energy levels, and to maintain or improve their well-being is needed.

IMPLICATIONS AND RECOMMENDATIONS FOR PRACTICE AND POLICY

It will be of interest for the individual resident, the organisation, and ultimately the health care system and society that we continuously strive for better residency training and safeguarding and improving residents' well-being. The recently introduced positive mind-set shift from managing being unwell to promoting and enhancing well-being must continue. Thinking from a positive perspective is also in line with the new concept of health as proposed by Huber et al: 'the ability to adapt and self-manage in the face of social, physical and emotional challenges.'⁸⁴ The attention for residents' well-being could be structured on organizational, department and individual level and we will describe our implications and recommendations on these levels.

On organizational level

On the organizational level, different stakeholders play an important role in

maintaining and improving residents' well-being. Hospital-wide coordinating educational committees could organize programs to create awareness, the right knowledge and training sessions for residents' well-being. To learn and develop good humanistic practice and improving residents' well-being hospitals have a role in creating and guaranteeing sufficient time for patient and supervisory contact, but also for personal time to handle and recover from difficult or confronting situations.

Expectation management for novice residents is also crucial in the context of experiencing well-being.⁸⁵ When residents experience a mismatch between the expected and real work environment and job content, they could end up disappointed, experience a decrease in well-being and quit residency training, as one resident in our interview study (chapter 3) also revealed. A good and solid preparation and clear communication (starting) on an organizational level before starting residency training seems therefore valuable.

On training program level

The impact of learning climate and faculty teachers' behaviours/performance on residents' well-being, learning and development justifies program directors and organizations to focus on these aspects to optimize high-quality residency training. Program directors should make all faculty teachers aware of their impact on residents and their function as a role model.

When a physician is feeling well and highly engaged this is positive for the individual physician, for the patients and for the organization. This makes physicians' work-engagement and well-being an applicable target point in striving for a healthier workforce and good quality care. Possible strategies on training program level could include eliminating or diminishing job demands that reduce well-being or introducing and improving job resources or facilitators that promote and enhance well-being. We found in this thesis that residents' work-related well-being could be facilitated

by optimizing autonomy, learning and development opportunities, and the efforts-rewards balance in residents' work. For creating more autonomy, residents could be supported by interventions. For example, Dunn describes successful interventions in increasing control over the dynamic work environment in health care.⁷¹ Team-based peer support seems to be another option to manage challenges for experiencing autonomy.⁷² In these peer support groups personal well-being could also be introduced as this showed improvements in health care providers' well-being.^{70,72} Another option to enhance conditions supportive for competence and autonomy in the modernized residency training program is stimulating the use of entrustable professional activities (EPAs).^{46,47}

As already said, in residency training it might be helpful to offer or make residents more aware of the resources that increase resilience, help in finding balance and stabilize or enhance well-being.^{53,60,76} Exploring what well-being means for the individual resident, with their personal characteristics and preferences, could be a relevant part of the modern individualized residency training program and could be addressed during performance progress interviews. These interviews may be prepared and supported by a more systematic inventory of a resident's current well-being, as well as his or hers experienced job resources and demands. Based on extensive conversations with physicians, including residents, the Professional Performance research group (Academic Medical Center, Amsterdam) recently launched such an online inventory. This so-called Vitality screening tool is now part of the Professional Platform Online portfolio.

One evidence-based option for a training in residency, is a mindfulness based training program.^{61,63,86} Nowadays, there are multiple smartphone applications available for exploring or practicing mindfulness exercises. It would be of interest for the individual residents and patient care to introduce such a training program, tailored to fit the needs of residents, in residency.

On resident level

On an individual level, we could prioritize residents' self-care as an element of medical professionalism. Professionalism is about caring for your patients but must also include how physicians care for themselves as this indirectly influences personal well-being and the quality of patient care they deliver. This means that physicians and residents must take personal leadership to take good care of themselves.⁸⁷ Personal leadership is the basis of all leadership, including (the development of) medical leadership. When seeing the complexity of the health care system as a challenge and thinking about options to contribute, this could result in physicians in leading roles.¹⁰ Personal leadership could therefore evolve into clinical leadership with tasks in improving patient care, education and scientific research and could ultimately grow to executive leadership with managerial tasks. This development could lead to a better connection between the workplace and the organization and better health care systems.¹⁰

From a leadership perspective, there is a role for the individual residents to explore which intervention works best for improvement of their well-being. One step forward in this continuous strive for improving residents' and physicians' well-being is the development of well-being improvement programs. For example, the Professional Performance research group (Academic Medical Center, Amsterdam) recently developed the 'well-being program' to stimulate physicians to take the lead in their personal well-being. The first step in this program is the evaluation of physicians' well-being with an evidence-based questionnaire based on literature, focus groups with physicians and a national needs assessment. This evaluation results in feedback with an individual report, which provides insight in the professional's personal vitality and well-being, and both evidence-based and inspiring examples to enhance well-being. Based on these results, it is recommended to organize a vitality meeting with all involved physicians (both faculty and residents) to discuss the results and explore and implement actual actions for improvement. We expect that these kinds of interventions will be valuable and useful for physicians; however, this should be confirmed in future studies.

CONCLUSION

There are various factors that influence residents' well-being. We found that autonomy, efforts-rewards balance, opportunities to learn and develop, and learning climate are crucial factors herein. They could, therefore, be important target points in residency training programs to maintain or enhance residents' work-related well-being. Health care organizations and hospital-wide coordinating educational committees should adopt this 'optimizing residents' well-being view' into their quality assurance policies and organize adapted training programs and interventions. A mindfulness-based intervention implemented in the training program could be a good option. Additionally, residents have a responsibility in safeguarding their personal well-being by taking personal leadership and intensifying self-care. Enhancing residents' well-being will be beneficial to individual residents, health care organisations, patients, and society.

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SUMMARY

Chapter 1 is the introductory chapter of this thesis. Herein we introduced the topic of our research: **residents' well-being**. Residents are physicians in training to become a medical specialist and face many work-related and educational demands. Well-being is under pressure in many professions; for physicians being well is not only crucial for the individual physician but also for the quality of patient care. As we are increasingly interested in the positive side of being well, including the predictors and consequences, we focused mainly on positive work-related well-being aspects as work-engagement, work satisfaction and empathy. Work engagement could be defined as a positive, fulfilling, work-related state of mind and is associated with better performance. Work satisfaction, is the satisfaction with work and could be divided into job and specialty satisfaction, and is also found to be important for both the individual and for patient care quality. Additionally empathy, the ability to understand, communicate and respond to patients' experiences and perspectives, is associated with satisfied and compliant patients and patients with better quality of life. A loss of empathy amongst physicians, described in recent literature, could be seen as a problematic consequence of experiencing distress and a lack of well-being. Based on research in occupational health psychology, it has been shown that specific work characteristics, the so-called job demands and resources, could predict the work-related well-being. As it is essential to conserve and where possible enhance the residents' well-being we aimed in this thesis to evaluate, clarify and possibly improve the work-related well-being of residents in residency training.

We started with describing the concerns on work-related well-being of residents based on national and international literature in Chapter 2. A healthy level of feeling well is essential for residents to function and perform optimally. Concerns about residents' work-related well-being have raised based on high rates of burn-out, depression and the experience of stress and anxiety amongst residents. A decreased residents' well-being has negative consequences for the individual doctor and also for the delivered quality of patient care. This could be seen in the literature describing delivery of suboptimal care, loss of empathy and increased

medical errors. To warrant and improve residents' well-being and functioning and additionally the quality of care they deliver it is essential to find solutions for the lack or reduction of well-being. Two potential strategies are to: (1) remove or reduce obstacles to residents' well-being and (2) provide resources to improve well-being. These strategies are in line with literature on the Job Demands and Resources model. The first strategy could be achieved by reducing job demands, that are all aspects of work that require constant mental or physical effort. When certain job demands cannot be eliminated, job resources could work as a buffer and may help to alleviate the negative effects of these demands. For the second solution one could improve or introduce job resources, the aspects of work that contribute to the achievement of work-related goals, reduce job demands and encourage personal development. Examples of resources are adequate supervision, feeling supported in work or for example attending a mindfulness training. We aimed to extend this knowledge by exploring residents' own experiences on work-related well-being in the next chapter.

With our research in [Chapter 3](#) we wanted to explore how Dutch residents' experience their own well-being in relation to their professional life. We performed a qualitative study using a phenomenological approach. Thirteen in-depth interviews were conducted with residents in various training programs using a semi-structured interview guide to explore participants' experiences of their well-being in relation to their professional life. The data was collected and analyzed through an iterative process using the thematic network approach. We found that residents' experiences could be assorted in main themes influencing well-being: patient care, teamwork, workplace-learning, organizational aspects, self-knowledge and work-life balance. The way residents felt experiences in these (often combined) themes and the duration influenced their experienced well-being. Additionally, effort-reward balance and autonomy were dominant overarching experiences in influencing residents' well-being. Experiencing sufficient autonomy was important in residents' roles as caregiver, as learner and in their private life. The experienced effort-reward balance could both positively and negatively influence well-being. These themes

and overarching experiences could be key for interventions and residency training adaptations for enhancing residents' well-being.

In [Chapter 4](#) we studied the levels of work engagement and empathy among residents and the relation with their experience of faculty's teaching performance. Faculty teachers rely on the feedback of residents about their teaching performance. However, the relation of residents' characteristics with evaluations of faculty is relatively unexplored. A multicenter questionnaire study was conducted and 271 surgery and gynaecology residents were invited to fill out the questionnaire. Residents' ratings of faculty's teaching performance were collected using the published System for Evaluation of Teaching Quality (SETQ). In addition, we evaluated work engagement and empathy, using the Utrecht Work Engagement Scale (UWES) and Jefferson Scale of Physician Empathy (JSPE) respectively. To evaluate the association of residents' engagement and empathy with residents' evaluations of teaching performance we performed linear regression analyses using generalized estimating equations (GEE's). We found that higher levels of residents' engagement and empathy were associated with higher faculty's teaching performance scores. A possible explanation is that residents who are more engaged and are able to understand and share others' perspectives, stimulate faculty's teaching performance and more positively experience their teaching. Another explanation could be that better teachers enhance residents' engagement and empathy and therefore bring positive feedback and feed-forward cycles in residency training.

We now know that work engagement is associated with better work performance, less medical errors and also with more positive evaluations of faculty's teaching performance. However, whether physicians' work-engagement is also associated with better performance in the eyes of patients is unclear. With our study described in [Chapter 5](#) we therefore wanted to evaluate whether patients experience better patient care delivery from physicians with higher levels of work engagement. In addition, we researched whether the job resources autonomy, collegial support,

participation in decision-making and opportunity to learn and develop are positively related to work engagement. We collected 4573 unique patient care experiences for 238 physicians at ten outpatient clinics of two academic medical centers. We measured patient care experience of physicians' behaviors during outpatient consultations with 9 validated items from the Dutch Consumer Quality Index. Physicians were asked to evaluate their job resources (autonomy, collegial support, participation in decision-making and opportunities to learn and develop) and work engagement using the validated Questionnaire on Experience and Evaluation of Work (QEEW) and the Utrecht Work Engagement Scale (UWES). We performed multivariate adjusted mixed linear models and linear regression analyses. Surprisingly, we did not find an association between physician work engagement and patient care experience. A possible explanation could be that physicians receive extensive training in professional interpersonal behaviors towards patients and this may act as a buffer in upholding standards despite the level of work engagement. In this study, we additionally found that autonomy and opportunities to learn and develop were positively associated with work engagement. These job resources could therefore be seen as target points for improving physicians' work-related well-being. To gain more knowledge on possible influencing factors for residents' well-being we continued our research with evaluating the impact of the learning climate on residents' work-related well-being.

In [Chapter 6](#) we therefore studied whether higher rated learning climate is positively associated with residents' work engagement, work satisfaction and empathy. An optimal learning climate is crucial for the quality of residency training and may also improve residents' well-being and empathy. We performed a multicenter questionnaire study among 271 surgery and gynaecology residents in 21 training programs. To evaluate learning climate we used the Dutch Residency Educational Climate Test (DRECT), consisting of 9 domains. To evaluate residents' work-related well-being we measured work engagement, work satisfaction and empathy. For these well-being measures we used the Utrecht Work Engagement Scale, the job

and specialty satisfaction measures from the Physician Worklife Study and the Jefferson Scale of Physician Empathy, respectively. We performed multivariable adjusted linear regression analyses and found that the overall learning climate was positively associated with work engagement and job satisfaction. We did not find associations between the learning climate and residents' empathy or specialty satisfaction. The positive association of learning climate with engagement and work satisfaction is consistent with previous research on the lack of well-being showing that learning climate was negatively associated with burn-out, the counterpart of engagement. Our results also align with the Job Demands and Resources model. Two of the nine learning climate domains were in particular associated with higher residents' engagement: 'educational atmosphere' and 'formal education'. A positive work atmosphere and structured, fitting, informative education are aspects likely to positively influence the enthusiastic, positive and fulfilling work-related state of mind (work engagement) of residents, and could therefore explain these findings. Job satisfaction was found to be most impacted by the learning climate domains 'educational atmosphere', 'teamwork', role of specialty tutor', 'resident peer collaboration', 'work adapted to competence' and 'accessibility supervisors'. The three learning climate domains making up the affective facet (educational atmosphere, teamwork, resident peer collaboration) are probably rated on a more emotional basis and the positive association with the feeling of job satisfaction is therefore understandable. This is also in line with literature. However, more work needs to be done to understand the (lack of) impact of the other domains on job satisfaction. In order to further explore possible resources for improving residents' work-related well-being we ended our research by conducting and investigating a possible intervention.

We evaluated the influence of Mind Fitness Training on work engagement, empathy, work satisfaction and stress perception of residents in [Chapter 7](#). Additionally, we explored how residents experience such a training based on the concepts of mindfulness. We performed a multicenter study in eight Dutch teaching hospitals.

We used both quantitative and qualitative approaches to data-collection and analysis. Eighty-nine surgical residents were invited to participate in pre- and post-intervention questionnaire surveys. Twenty-two residents voluntarily participated in the conducted Mind Fitness Training program and were additionally invited to evaluate the training and talk about their experience by post-intervention interviews including open questions. Our results showed that the residents in the intervention-group reported an increase in specialty satisfaction and a decrease in perceived stress, while no substantial changes were observed in residents in the control-group. Participation in mind fitness training was positively associated with residents' empathy and specialty satisfaction scores. In addition, residents positively evaluated the Mind Fitness Training and with the interviews we found out that they perceived improvement in focusing skills and reported being more aware of their own state of mind and feeling calmer and more in control. These results imply that a Mind Fitness Training has a positive impact on residents' work-related well-being.

In [Chapter 8](#) we conclude with a general discussion. The results of the above-described studies are discussed and placed in a broader perspective of the literature on residents' well-being. Additionally we described the strengths and limitations of this thesis and the implications for future research and practice. We recapitulated that residents' work-related well-being is complex and is impacted by a variety of factors as found in our research. We recommend to use these found factors as target points in training programs in order to conserve or enhance residents' work-related well-being. Also, the positively received Mind Fitness Training could be an useful addition in residency. It will be of interest for individual residents, the health care institutions, and finally also for patient care and society that we continuously strive for better residency training and improving residents work-related well-being. The attention and actions for improving residents' well-being could be structured on organizational, training program and individual level.

SAMENVATTING

Hoofdstuk 1 is het inleidende hoofdstuk van dit proefschrift. We introduceerden hier het onderwerp van ons onderzoek: het welzijn van arts-assistenten in opleiding tot specialist (aios). Aios zijn afgestudeerde basisartsen in opleiding tot medisch specialist en zij worden met vele werkgerelateerde en opleidingseisen geconfronteerd. In vele beroepen staat het welzijn onder druk; voor dokters is het welzijn niet alleen cruciaal voor de individuele dokter maar ook voor de kwaliteit van de patiëntenzorg. Aangezien we in onderhavig onderzoek geïnteresseerd zijn in de positieve kant van het welzijn, inclusief de voorspellers en consequenties, hebben we ons voornamelijk gericht op positieve werkgerelateerde welzijnsaspecten zoals baanbevlogenheid, werktevredenheid en empathie. Baanbevlogenheid kan worden gedefinieerd als een positieve, voldane, werk-gerelateerde mentale staat en is geassocieerd met beter functioneren. Werktevredenheid is de tevredenheid met werk en kan worden onderverdeeld in baan- en specialismetevredenheid. Het wordt belangrijk geacht voor zowel het individu als de kwaliteit van de patiëntenzorg. Ook empathie, de bekwaamheid om ervaringen en perspectieven van een patiënt te begrijpen, erover te communiceren en hierop te reageren, is geassocieerd met meer tevreden en therapietrouwe patiënten en patiënten met een betere kwaliteit van leven. Vermindering van empathie onder dokters, zoals beschreven in de recente literatuur, kan worden gezien als een problematische consequentie van het ervaren van stress en een gebrek aan welzijn. Gebaseerd op onderzoek in de psychologie van arbeid en gezondheid wordt beschreven dat specifieke werkkenmerken, de zo genoemde taakeisen en energiebronnen, het werkgerelateerde welzijn kunnen voorspellen. Aangezien het essentieel is het welzijn van aios te behouden en waar mogelijk te verbeteren was het doel van dit proefschrift om het werkgerelateerde welzijn van aios te evalueren, verklaren en waar mogelijk te verbeteren. We begonnen met het beschrijven van de zorgen van het werkgerelateerde welzijn van aios gebaseerd op nationale en internationale literatuur in Hoofdstuk 2.

Een gezonde mate van welzijn is essentieel om als aios optimaal te kunnen functioneren en presteren. De ontstane zorgen over het werkgerelateerde welzijn van aios zijn gebaseerd op hoge percentages van burn-out, depressie en het

ervaren van stress en angst onder aios. Een verminderd welzijn van aios heeft negatieve consequenties voor zowel de individuele dokter als voor de geleverde kwaliteit van zorg. De literatuur rapporteert suboptimale zorg, verlies van empathie en een toename van medische fouten. Om het welzijn en functioneren van aios te behouden en te verbeteren en uiteindelijk ook de kwaliteit van zorg die zij leveren, is het essentieel om oplossingen te vinden voor het gebrek aan, of de vermindering van, welzijn. Twee potentiële strategieën zijn hierbij denkbaar: (1) het verwijderen of verminderen van de obstakels die het welzijn van aios reduceren en (2) het aandragen van energiebronnen die het welzijn kunnen verbeteren. Deze strategieën komen overeen met de literatuur over het model van de taakeisen en energiebronnen, bekend als het JDR (Job Demands and Resources) model. De eerste strategie kan gerealiseerd worden door het verminderen van de taakeisen, dat zijn de aspecten van werk die constant mentale of fysieke inspanning vereisen. Als bepaalde taakeisen niet verwijderd kunnen worden, kunnen energiebronnen als buffer werken en helpen bij het verminderen van de negatieve effecten van deze taakeisen. Voor de tweede oplossingsstrategie denken we aan het verbeteren of introduceren van energiebronnen, de aspecten van werk die bijdragen aan het bereiken van werkgerelateerde doelen, het verminderen van taakeisen en persoonlijke ontwikkeling stimuleren. Voorbeelden van energiebronnen zijn adequate supervisie, het gevoel gesteund te worden in het werk of bijvoorbeeld het volgen van een aandacht training. Om onze kennis hierover te kunnen vergroten hebben we de ervaringen van de aios op het gebied van hun werkgerelateerde welzijn geëxploreerd in het volgende hoofdstuk.

Met de studie beschreven in Hoofdstuk 3 wilden we exploreren hoe de Nederlandse aios hun welzijn ervaren in relatie tot hun professionele leven. We voerden een kwalitatieve studie uit met een fenomenologische benadering. Dertien diepte interviews werden verricht met aios van verschillende opleidingen en disciplines waarbij we met behulp van een semi-gestructureerde interviewleidraad de door aios ervaren welzijn in relatie tot hun professionele leven exploreerden. De gegevens werden verzameld en geanalyseerd via een iteratief proces waarbij gebruik werd

gemaakt van de thematische netwerkbenadering. De bevindingen laten zien dat de ervaringen van aios kunnen worden geordend in hoofdthema's die welzijn beïnvloeden: patiëntenzorg, werken in teamverband, opleiding op de werkvloer, organisatie aspecten, zelfkennis en de werk-privé balans. De manier waarop ervaringen in deze (vaak gecombineerde) thema's worden beleefd en de duur ervan beïnvloedden het ervaren welzijn. Aanvullend bleken de balans tussen inspanning en beloning en de ervaren autonomie dominante overkoepelende ervaringen in het beïnvloeden van het welzijn van aios. Het ervaren van voldoende autonomie bleek belangrijk voor de aios in de rol als zorgverlener, als opleideling en in het privé leven. De ervaren inspanning-beloning balans kan het welzijn zowel positief als negatief beïnvloeden. Deze thema's en overkoepelende ervaringen kunnen de sleutel zijn voor interventies en aanpassingen in de opleiding om het welzijn van aios te bevorderen.

In Hoofdstuk 4 onderzochten we de mate van baanbevlogenheid en empathie onder aios en de relatie met hun ervaring van de opleiderkwaliteiten van de opleiders. Opleiders vertrouwen wat betreft hun opleiderkwaliteiten op de feedback van aios. Echter, de relatie tussen de karakteristieken van aios en de evaluaties van opleiders is relatief onbekend. Een multicenter vragenlijstonderzoek werd verricht en 271 aios chirurgie en gynaecologie werden uitgenodigd om een vragenlijst in te vullen. Aios beoordelingen van de opleiderkwaliteiten van hun opleiders werden verzameld met behulp van het 'System for Evaluation of Teaching Quality' (SETQ). Aanvullend evalueerden we baanbevlogenheid en empathie met behulp van de 'Utrechtse Bevlogenheid Schaal' (UBES) en de 'Jefferson Scale of Physician Empathy' (JSPE), respectievelijk. Om de associatie van baanbevlogenheid en empathie van de aios met de door de aios ingevulde evaluaties van de opleiderkwaliteiten te evalueren verrichtten we lineaire regressie analyses met behulp van gegeneraliseerde schattingsvergelijkingen (GEE's). Een hogere mate van baanbevlogenheid en empathie bij de aios bleek geassocieerd met hogere beoordelingen van de opleiderkwaliteiten van de opleiders. Een mogelijke verklaring is dat aios die meer

bevlogen zijn en andermans perspectieven beter kunnen begrijpen en delen, het goed opleiden door opleiders meer stimuleren en ook als beter ervaren. Een andere verklaring zou kunnen zijn dat betere opleiders de bevoegdheid en empathie van aios bevorderen en daardoor een positieve feedback en feed forward cyclus in de opleiding brengen.

We weten inmiddels dat baanbevoegdheid is geassocieerd met beter functioneren op het werk, minder medische fouten en ook met positieve evaluaties van opleiderkwaliteiten. Echter, of bevoegde artsen beter functioneren in de ogen van patiënten was nog onbekend. Met ons onderzoek in Hoofdstuk 5 wilden we daarom evalueren of patiënten betere zorg ervaren van meer baanbevoegde dokters. Tevens onderzochten we of de vier energiebronnen autonomie, collegiale steun, deelname aan besluitvorming en leer- en ontwikkelmogelijkheden, positief gerelateerd zijn aan bevoegdheid van artsen. We verzamelden 4573 unieke patiëntenervaringen voor 238 dokters van 10 poliklinieken in 2 academische ziekenhuizen. We evalueerden het functioneren van de dokters zoals ervaren door de patiënt op de polikliniek met behulp van 9 gevalideerde items van de Nederlandse 'Consumer Quality Index'. Dokters werden gevraagd hun energiebronnen (autonomie, collegiale steun, deelname aan besluitvorming en leer- en ontwikkelingsmogelijkheden) en baanbevoegdheid te evalueren door middel van de gevalideerde Vragenlijst voor Beleving en Beoordeling van Arbeid en de Utrechtse Bevoegdheid Schaal (UBES). We voerden multivariate gecorrigeerde lineaire gemengde modellen en lineaire regressie analyses uit. Onverwachts vonden we geen verband tussen de baanbevoegdheid van dokters en de ervaringen van patiënten met de door hen geboden zorg. Een mogelijke verklaring zou kunnen zijn dat dokters dusdanig uitgebreid worden opgeleid in professioneel interpersoonlijk gedrag richting patiënten dat dit als een buffer fungeert in het ondersteunen van de standaard ongeacht de mate van bevoegdheid. Aanvullend vonden we in dit onderzoek dat autonomie en leer- en ontwikkelingsmogelijkheden een positief verband hebben

met baanbevlogenheid. Deze energiebronnen zouden daarom gezien kunnen worden als belangrijke sleutels tot het verbeteren van het werk gerelateerde welzijn van dokters. Om meer kennis te verkrijgen van de mogelijk beïnvloedende factoren voor het welzijn van aios vervolgen we ons onderzoek met het evalueren van de impact van het opleidingsklimaat op het werkgerelateerde welzijn van aios.

In Hoofdstuk 6 onderzochten we derhalve of er een verband bestaat tussen een beter opleidingsklimaat en de baanbevlogenheid, werktevredenheid en empathie van de aios. Een optimaal opleidingsklimaat is cruciaal voor de kwaliteit van de opleiding en zou ook het welzijn van aios kunnen verbeteren. We verrichtten een multicenter vragenlijstonderzoek onder 271 aios chirurgie en gynaecologie van 21 opleidingen. Om het opleidingsklimaat te evalueren gebruikten we de 'Dutch Residency Educational Climate Test' (DRECT), bestaande uit 9 domeinen. Om het werkgerelateerde welzijn van aios te evalueren onderzochten we baanbevlogenheid, werktevredenheid en empathie. Voor deze welzijnsmetingen maakten we gebruik van de Utrechtse Bevlogenheid Schaal, de baan- en specialismetevredenheid metingen van de Physician Worklife Study en de Jefferson Scale of Physician Empathy, respectievelijk. We voerden multivariabele gecorrigeerde lineaire regressie analyses uit en deze toonden een positief verband tussen het algehele opleidingsklimaat en zowel baanbevlogenheid als ook de werktevredenheid van aios. We konden geen verband aantonen tussen het opleidingsklimaat en het empathisch vermogen noch de tevredenheid van aios met het gekozen specialisme. Het positieve verband tussen het opleidingsklimaat en baanbevlogenheid en werktevredenheid is in lijn met eerder onderzoek naar het ontbreken van welzijn, dat laat zien dat het opleidingsklimaat een negatief verband heeft met burn-out, het tegenovergestelde van bevlogenheid. Onze resultaten zijn ook in lijn met het eerdergenoemde JDR model. Twee van de negen opleidingsklimaatdomeinen zijn specifiek geassocieerd met een hogere mate van baanbevlogenheid: 'atmosfeer van de opleiding' en 'formeel onderwijs'. Een positieve werksfeer en gestructureerd, aansluitend onderwijs zijn aspecten die

logischerwijs positieve invloed hebben op de enthousiaste, positieve, voldane mentale staat (bevlogenheid) van aios en zou een verklaring kunnen zijn van deze bevindingen. Baantevredenheid bleek het meest beïnvloed te worden door de opleidingsklimaatdomeinen 'atmosfeer van de opleiding', 'werken in teamverband', 'de rol van de hoofd opleider', 'samenwerking van aios onderling', 'werk aangepast aan het competentieniveau' en 'toegankelijkheid van de supervisors'. De drie opleidingsklimaatdomeinen die het affectieve domein vormen (atmosfeer van de opleiding, werken in teamverband, samenwerking van aios onderling) worden waarschijnlijk meer gewaardeerd op een emotionele basis en het positieve verband met het gevoel van baantevredenheid is daarom begrijpelijk. Dit komt ook overeen met de literatuur. Meer onderzoek zal wel gedaan moeten worden om (het uitblijven van) de invloed van de andere domeinen op baantevredenheid te begrijpen. Om verder te exploreren wat de mogelijke energiebronnen zijn voor het verbeteren van het werkgerelateerde welzijn van aios sloten we ons onderzoek af met het opzetten en onderzoeken van een mogelijke interventie.

We evalueerden de invloed van Mind Fitness Training op baanbevlogenheid, empathie, werktevredenheid en de ervaren stress van aios in [Hoofdstuk 7](#). Aanvullend exploreerden we hoe aios een dergelijke training gebaseerd op de concepten van mindfulness ervaren. We verrichtten een multicenter onderzoek in acht Nederlandse opleidingsziekenhuizen. We gebruikten zowel kwantitatieve als kwalitatieve benaderingen om gegevens te verzamelen en te analyseren. Negenentachtig aios heelkunde werden uitgenodigd om deel te nemen aan de pre- en post-interventie vragenlijsten. Tweeëntwintig aios participeerden vrijwillig in het opgezette Mind Fitness Training programma en werden aanvullend uitgenodigd om de training te evalueren en te praten over hun ervaringen tijdens post-interventie interviews met open vragen. Onze resultaten toonden een toename in specialismetevredenheid en een vermindering in ervaren stress bij de aios in de interventie groep aan, terwijl er geen substantiële verschillen werden geobserveerd bij de aios in de controle groep. Deelname aan de Mind Fitness Training liet een positief verband zien met empathisch vermogen en specialismetevredenheid van aios. Verder beoordeelden

aios de Mind Fitness Training positief en tijdens de interviews rapporteerden aios een ervaren verbetering in het kunnen focussen. Tevens rapporteerden aios een groter bewustzijn van hun eigen mentale staat, een kalmer gevoel en een gevoel van meer controle. Deze resultaten impliceren dat een Mind Fitness Training een positieve invloed heeft op het werkgerelateerde welzijn van aios.

In Hoofdstuk 8 sloten we af met de algemene discussie. De resultaten van de hierboven beschreven onderzoeken werden besproken en geplaatst in een breder perspectief van de literatuur over het welzijn van aios. Hierna beschreven we de sterke punten en limitaties van dit proefschrift en de implicaties voor toekomstig onderzoek en de praktijk. We resumeerden dat het werkgerelateerde welzijn van aios complex is en wordt beïnvloed door een variëteit aan factoren zoals in ons onderzoek naar voren komt. We adviseren de in onze studies aangetoonde relevante welzijnsfactoren te gebruiken om het werkgerelateerde welzijn van aios te behouden of verbeteren. De eerder beschreven positief ervaren en impactvolle Mind Fitness Training zou verder een nuttige aanvulling zijn in de opleiding. Het is in het belang van de individuele aios, de organisatie, en uiteindelijk ook van de patiëntenzorg en samenleving dat we continu streven naar een betere opleiding voor aios en het verbeteren van het werkgerelateerde welzijn. De aandacht en acties om het welzijn van aios te verbeteren kan gestructureerd worden op het niveau van de organisatie, de opleiding en het individu.

DANKWOORD

Met het schrijven van dit dankwoord is mijn proefschrift echt bijna af. Een heel bijzonder gevoel na hier jaren hard aan gewerkt te hebben. Veel mensen hebben op verschillende manieren een bijdrage geleverd aan dit proefschrift. Ik kan met veel plezier terugdenken aan deze periode en ben dankbaar voor alle steun die ik hierbij heb mogen ervaren. Hoewel ik vast mensen ga vergeten te benoemen, wil ik hieronder de volgende mensen persoonlijk bedanken.

Allereerst wil ik alle participanten (artsen en patiënten) bedanken voor deelname aan dit onderzoek. Zonder jullie had ik deze onderzoeken niet kunnen verrichten en dit proefschrift niet kunnen schrijven.

Hierna wil ik natuurlijk mijn fantastische 'promoteam' bedanken. Wat heb ik geluk gehad met zo een divers, geleerd en inspirerend gezelschap.

Professor Lombarts, lieve Kiki, je hebt me op een vrije en open manier kennis laten maken met de wetenschappelijke wereld en me begeleid tot en met deze grote dag. Je kennis, betrokkenheid en medemenselijkheid heb ik erg gewaardeerd. Gedurende mijn promotie traject ben je professor geworden. En terecht ook; je bent ontzettend bevlogen, gedreven en doortastend. Bedankt voor de energie en inspiratie die ik van je gekregen heb en voor alle leerzame momenten.

Professor Heineman, beste Erik, ik heb genoten van alle bijeenkomsten en overlegafspraken die we hebben gehad. Met jouw ervaring als arts, onderzoeker, manager en opleider in verschillende ziekenhuizen (in verschillende landen) weet je altijd weer met nieuwe inzichten te komen en met een kritische blik naar de stukken te kijken. Bedankt dat ik ondanks je drukke agenda, al deze ondersteuning heb mogen ontvangen.

Dr Pierik, beste Robert, ontzettend bedankt voor alles! Je oprechte interesse en fantastische coaching zijn zeer waardevol voor mij geweest. Hierdoor ben ik op

dit promotiepad terecht gekomen en door jouw adviezen kwam ik daarnaast in opleiding tot chirurg. Deze combinatie is een zeer goede gebleken en hierdoor heb ik me kunnen ontwikkelen tot de arts en onderzoeker die ik nu ben. Je hebt veel toegevoegd door je praktijkervaring, creatieve inzichten en brede blik, maar ook zeker door je onovertroffen mensenkennis. Bedankt!

Professor Arah, beste Onyi, het is fantastisch hoe jij statistiek begrijpelijk en leuk kunt maken! Ik heb veel geleerd van je ondersteuning op statistisch, methodologisch en taal-technisch gebied. Hoewel je ver weg woont, leek je altijd dichtbij. Ik ben je dankbaar voor al je support, maar ook voor je gezelligheid en humor tijdens onder andere de Heusdenweken.

Hooggeleerde leden van de leescommissie, prof. dr. Busch, prof. dr. Demerouti, prof. dr. Heineman, prof. dr. Jaarsma, prof. dr. Scherpbier en prof. dr. Sluiter, hartelijk dank voor jullie tijd en kritische beoordeling van mijn proefschrift.

Uiteraard wil ik ook graag mijn onderzoekscollega's van de Professional Performance onderzoeksgroep bedanken. Renée 1, Irene, Benjamin en Renée 2, vanaf mijn eerste kennismaking met de onderzoeksgroep waren jullie aanwezig en heb ik van de samenwerking met jullie genoten. De wetenschappelijke discussies die we hebben gevoerd, de feedback op mijn artikelen, de gezellige bijklets-momenten en de mooie promotievoorbeelden die jullie hebben gegeven zijn van veel waarde voor mij geweest! Renée 1, bedankt dat ik mocht genieten van je optimisme, altijd aanwezige oprechte interesse en warmte. Irene, je sprankelende verschijning, je enthousiasme en behulpzame adviezen zijn onovertroffen. Ben, dank voor je nuchtere, kritische, wetenschappelijke blik en behulpzaamheid. Renée 2, jouw doortastendheid en brede wetenschappelijke kennis op 'ons' onderzoeksgebied zorgen voor een fijne samenwerking en dit

heeft mij erg geholpen. Joost, Joris, Milou, Alina en Myra, jullie ben ik iets later in mijn promotietraject tegen gekomen. De vele raakvlakken, de positiviteit en behulpzame spar- en overlegmomenten zijn zeer inspirerend geweest. Bedankt! Guusje, Mirja, Elisa en Maarten, ook jullie wil ik hartelijk danken voor jullie belangstelling, feedback en steun in de afrondende fase van mijn promotie traject.

Natuurlijk wil ik ook Maas Jan Heineman, Albert Scherpbier en Cees Van Vleuten bedanken voor de 'Groot Bloem' bijeenkomsten die ik heb mee mogen maken. Met een frisse, wetenschappelijke en brede blik hebben jullie mee gedacht over mijn onderzoekslijn en artikelen.

Veel dank gaat ook uit naar de 'Slangenburger'-club. Irene, Renée, Emma en Karsten, jullie hebben me iedere keer weer weten te inspireren. Of het nou om een klooster of Starbucks date ging, deze momenten zorgden voor productiviteit en een zeer positief gevoel!

Collega-assistenten chirurgie en chirurgen uit Isala bedankt voor de support voor mijn onderzoek die ik heb ervaren naast mijn werk als arts-assistent. Heel fijn dat ik een parttime dag voor onderzoek kon opnemen en dat er altijd interesse was in de stand van zaken. Een mooie operatie, de fijne samenwerking, en een gezellig gesprek tijdens de borrel zijn 'energiebronnen' geweest om mijn promotieonderzoek te kunnen afmaken.

Mijn lieve Epe-vriendinnen. Liesje, al vanaf de peuterspeelzaal zijn wij vriendinnen. Geen wonder dat we elkaar zo goed aanvoelen. Dank voor je steun door dik en dun. Maaïke, MJ, Charis en Annelin, jullie zijn mijn andere vriendinnetjes van het eerste uur. Wat fijn dat het contact altijd gebleven is ondanks de verschillende wegen die

we bewandeld hebben. Bedankt voor de onvergetelijke gezamenlijke momenten en onuitputtelijke waardering die ik van jullie heb mogen ontvangen.

Kirsten, IIsalien, Karine, en Hanna Mai, samen vormen we 'the big five'. Zwolle vriendinnetjes Christel, Brenda, Yvonne en Martine. Dank voor jullie altijd aanwezige oprechte interesse en vele mooie ontspan momenten in Suriname, Curaçao, Texel, Zwolle en Groningen. Dat er nog vele mogen volgen!

Mijn sportmaatjes, mannen van ons zaalvoetbalteam TTP, heerlijk om regelmatig met jullie door de zaal te hebben gerend. Ik heb ervan genoten om met jullie te voetballen en een biertje na afloop te kunnen drinken. Deze ontspanning was een zeer welkome afwisseling voor het werkende en onderzoekende leven.

Lieve Frans, bedankt voor een mooie periode in mijn leven. Tijdens een groot deel van mijn promotietraject heb je me bijgestaan en dat waardeer ik enorm.

Irene Slootweg en Renée Scheepers, mijn lieve paranimfen, ik heb jullie al eerder genoemd, maar toch wil ik nog even specifiek benadrukken dat ik ontzettend blij ben dat jullie naast me staan tijdens de grote dag. Zowel op het gebied van onderzoek als persoonlijk heb ik veel aan jullie gehad de afgelopen jaren. Dank voor jullie support, energie en gezelligheid tijdens mijn gehele promotietraject!

Lieve vrienden, familie en schoonfamilie, ik ben heel dankbaar voor en blij met alle betrokkenheid, interesse, en plezier die ik van en met jullie heb mogen ervaren. Lieve Mark en Esther, bedankt dat de deur altijd openstaat. Ik hoop op nog veel mooie Lases-momenten!

Lieve papa en mama, ik ben ontzettend blij met jullie. De combinatie van ruimte en steun die jullie mij altijd gegeven hebben in het maken van mijn keuzes heeft er voor gezorgd dat ik nu hier sta. Papa, hoewel het natuurlijk vreselijk jammer is dat jij hier nu niet bij kan zijn, weet ik zeker dat jij trots bent en dit al had voorzien toen ik aan mijn promotietraject begon. Mama, jouw altijd beschikbare luisterend oor en onvoorwaardelijke steun en liefde hebben mij enorm geholpen en daar ben ik je erg dankbaar voor.

Lieve broers, Ralph en Mitch, we hebben samen een mooie jeugd gehad in Epe en zijn daarna allen een eigen weg ingeslagen. Toch zoeken we elkaar altijd weer op en staan jullie op ieder moment voor me klaar. Heerlijk om regelmatig samen een kop koffie te drinken, naar Terschelling te gaan, een potje te vissen, een biertje te doen of gewoon even te kletsen. Dank voor jullie onuitputtelijke support!

Lieve Renzo, ik ben ontzettend blij dat wij elkaar zijn tegen gekomen. Je hebt me alle ruimte gegeven voor mijn eigen activiteiten en als ik 'toch nog wat aan mijn onderzoek' moest doen. Daarnaast zorg je voor de relativering en ontspanning die nodig is voor de juiste balans. Ik geniet van alle momenten die we samen zijn en wil je bedanken voor de liefde, energie en vrolijkheid die je me geeft. Na het afsluiten van deze uitdaging, hoop ik nog veel mooie nieuwe uitdagingen samen met jou aan te gaan.

CURRICULUM VITAE

Curriculum Vitae

Lenny Lases was born in Sandton, South Africa, on July 10th 1986. After finishing high school (Regionale Scholen Gemeenschap Noord Oost-Veluwe, Epe) she started studying Medicine at the University of Groningen in 2004. During her master program her interest for surgery and research was sparked and continued growing. After her graduation as a medical doctor in 2011, she started working at the surgery department at the teaching hospital Isala in Zwolle and applied for surgical residency training in 2013. During her period in the teaching hospital in Isala, Robert Pierik and Erik Heineman introduced her to Kiki Lombarts, resulting in a PhD project in the Academic Medical Center in Amsterdam in 2012 under supervision of Kiki Lombarts, Erik Heineman, Robert Pierik and Onyebuchi Arah. Because of the growing concerns on the well-being of physicians, being a resident herself, and the extensive interest to find solutions to improve well-being, she was caught by the subject residents' well-being. In the course of her PhD she developed herself as a researcher and performed both quantitative and qualitative research. Meanwhile, she was doing her surgery residency training, was committee member of the annually 'Isala Wetenschapsavond', and chaired the Association of Residents in Isala (VAIK) for three years. After completing her PhD she will continue with her surgery residency and hopes to contribute to the well-being of residents as well as patients.

PHD PORTFOLIO

PhD Portfolio

PhD Candidate: S.S. (Lenny) Lases

PhD period: 2012 - 2017

PhD supervisors: Prof. dr. M.J.M.H. Lombarts, Prof. dr. E. Heineman,
Dr. E.G.J.M. Pierik, Prof. dr. O.A. Arah

PhD training and teaching	Year(s)	Workload (ECTS)
Courses		
Practical biostatistics - AMC	2013	1.1
Oral presentation - Isala Academie	2011	0.3
Poster presentation - Isala Academie	2011	0.3
(Inter)national conferences		
Modernisering Meidsche Vervolgopleidingen (MMV)	2012	0.3
Chirurgendagen, Veldhoven	2012-2016	3.0
Najaarsdag Heelkunde	2013-2016	1.2
Association for Medical Education in Europe (AMEE)	2013	1.0
Symposium Experimenteel Onderzoek Heelkundige Specialismen (SEOHS)	2013	0.3
International Conference on Residency Education (ICRE), Vancouver	2015	1.0
Rogano Conference in Medical Education, Barcelona	2016	0.6
Smart Surgery Conference, Amsterdam	2017	0.3
European Association for Physician Health (EAPH), Paris	2017	0.5
Workshops, masters, classes, seminars		
Regularly research seminars, Journal club	2012-2015	0.3
Wetenschapsavond, Isala	2012-2016	0.5
AMEE pre-conference workshops	2013	0.3
Rogano conference workshops	2016	3.0

Workshop/seminars during Professional Performance Symposium, NVMO pre-conference, Egmond aan Zee	2016	0.3
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Presentations

<i>Top Mind</i> . Workshop with A.J. Willemsen, Isala, Zwolle	2013	0.5
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<i>Residents' engagement and empathy influence their evaluations of faculty's teaching performance</i> . Poster presentation, AMEE, Prague	2013	0.5
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<i>Building student engagement</i> . Workshop with Prof. Jaarsma, dr. Mastenbroek, drs. vd Berg, dr. Scheepers, AMEE, Prague	2013	0.5
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<i>Vitaliteit van de zorgprofessional</i> . Workshop with Prof. E. Heineman, NFU Master Kwaliteit en Veiligheid in de Patientenzorg, Groningen	2014+2016	1.0
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<i>Het welzijn van artsen</i> . Oral presentation with dr. Scheepers, Triple A lunch session, AMC	2015	0.5
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<i>Evaluating Mind Fitness Training and Its Potential Effects on Surgical Residents</i> . Oral Presentation, ICRE, Vancouver	2015	0.5
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<i>The Importance of Residents' Well-being</i> . Oral Presentation & discussion, Rogano Conference, Barcelona	2016	0.5
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<i>Welzijn van artsen & professional performance</i> . Workshop with dr. Scheepers, Professional Performance Symposium, NVMO pre-conference, Egmond aan Zee	2016	0.5
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<i>Redo fundoplication after Angelchick procedure</i> . Video case & presentation, Reflux Symposium Zwolle	2016	0.5
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<i>Learning climate positively influences residents' well-being</i> . Oral presentation, EAPH, Paris	2017	0.5
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Other

Member of Vereniging Arts-Assistenten Isala Klinieken	2011-2017	3
Chair of Vereniging Arts-Assistenten Isala Klinieken	2014-2017	3
Member of the 'Wetenschapscommissie', Isala, Zwolle	2014-2016	3
Chair during session on Reflux Symposium, Zwolle	2016	0.1

'You can't stop the waves, but you can learn to surf'