NICOLE MASTENBROEK

THE ART of staying ENGAGED

The role of personal resources in mental well-being of young veterinary professionals

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THE ART OF STAYING ENGAGED

The role of personal resources
in mental well-being of young veterinary professionals

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De rol van persoonlijke hulpbronnen in het welbevinden
van jonge veterinaire professionals
(met een samenvatting in het Nederlands)

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Nicole Jessy Johanna Maria Mastenbroek
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Promotoren: Prof. dr. P. van Beukelen
Prof. dr. A.D.C. Jaarsma
Prof. dr. E. Demerouti
Prof. dr. A.J.J.A. Scherpbier

"Work is love made visible"
— Kahlil Gibran - The Prophet, 1923

Opgedragen aan mijn vader Emile M. Mastenbroek
Een bevlogen mens

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CHAPTER 1

Introduction

Introduction

The work of the veterinarian has changed during recent decades. Clients are better informed and more demanding, veterinary practices are more competitive, partnerships within and outside the profession have increased and the position of the veterinarian in terms of his or her role in monitoring public health is up for discussion (Vaarkamp, 2009). These changing demands call for veterinarians who are able to integrate knowledge and technical skills with non-technical competencies (especially in the area of communication, collaboration and entrepreneurship) in their professional practice. Research in both veterinary and medical health professions has shown that junior veterinarians as well as junior doctors signal a lack of non-technical, generic, competencies (Brennan et al., 2010; Jaarsma, Dolmans, Scherpbier, & Van Beukelen, 2008; Matheson & Matheson, 2009). Perceived unpreparedness in generic competencies is positively associated with burnout in junior doctors (M. Westerman et al., 2013). Burnout levels from 10 to 21 % among junior doctors might indicate that the challenges they are facing are bigger than they can manage (Prins et al., 2007; M. Westerman et al., 2013). In a review of prospective studies on prevalence and predictors of mental health problems in doctors, Tyssen and Vaglum (2002) conclude that mental health problems were highest during the first postgraduate year. Research into the mental well-being of recently graduated veterinarians is scarce although we know that young and female vets are most at risk for work-related exhaustion (Bartram, Yadegarfar, & Baldwin, 2009; Gardner & Hini, 2006; Reijula et al., 2003). With increasing numbers of female vets entering the profession, it seems particularly important that the well-being of recently graduated veterinary professionals is carefully monitored. Before we turn to the needs of veterinary and medical professionals in their initial years after graduation we will first consider the current state of research on mental well-being in health care professions in general and veterinary professionals in particular.

Current state of research on mental well-being in health care professions

Mental well-being of veterinarians in general has been reported as a main concern in the United Kingdom (Bartram et al., 2009; Fritschi, Morrison, Shirangi, & Day, 2009), New Zealand (Gardner & Hini, 2006), Australia (Meehan & Bradley, 2007), Finland (Reijula et al., 2003) and Belgium (Hansez, Schins, & Rollin, 2008). When studying the literature on mental well-being and its predictors among veterinary professionals there are two issues that stand out. Firstly, most studies take a primarily negative perspective on mental well-being (Fritschi et al., 2009; Gardner & Hini, 2006; Hansez et al., 2008; Reijula et al., 2003) and secondly, there is an absence of a theoretical framework in most studies. Frequently the aim is to identify the work characteristics

that cause stress or reduced well-being. Long lists of possible antecedents of mental well-being have been produced. Examples of possible antecedents in veterinarians are an imbalance between personal life and career, low remuneration (Heath, 2002; Reijula et al., 2003), relationships with clients, demanding clients, heavy workload, time management (simultaneous emergencies, during consulting hours) and poor working conditions (Hansez et al., 2008). However, psychological well-being encompasses positive as well as negative states (Cropanzano & Wright, 2001). During the last two decades the focus of research on mental well-being in the domain of work psychology shifted from a focus on poor mental health and the negative aspects of the working experience to a focus on work characteristics that foster positive mental well-being, job satisfaction and work engagement. Occasionally there is some attention for positive mental well-being in studies on well-being among veterinarians (Bartram et al., 2009; Hansez et al., 2008), residents (Prins et al., 2010) and among dentists (Brake, Bouman, Gorter, Hoogstraten, & Eijkman, 2007). Work characteristics that have been identified as helpful in dealing with stress, or as a source of satisfaction for veterinarians in general, were colleague and supervisor support (Bartram et al., 2009; Gardner & Hini, 2006), good clinical outcomes and intellectual challenge (Bartram et al., 2009). In the medical domain a study among all registered Dutch medical residents showed that the clinical setting (type of clinic they were working) and type of speciality seemed to play a role in burnout and work engagement (Prins et al., 2010). Dentists considered immediate results and aesthetics, long term results of working with patients, patient care in general and craftsmanship as inspiring aspects of work (Gorter, Te Brake, Eijkman, & Hoogstraten, 2006). Mental well-being can be increased not only by eliminating negative factors but also by promoting the availability of positive work characteristics. Mental well-being is positively related to performance (Freeney & Fellenz, 2013; Prins et al., 2009) and to attributes of professionalism such as empathy and the ability to provide compassionate care (West & Shanafelt, 2007) in health care professions.

The first years in professional practice

Riggs, Routly, Taylor and Dobson (2001) and Routly, Taylor, Turner, McKernan and Dobson (2002) investigated the support needs of veterinary surgeons during their first few years of practice both from the perspective of the new graduate, and from the perspective of the employer. They advocated increased exposure to routine cases in the curriculum in order to gain practical experience, which would help the new graduate to build a relationship with the client and start to earn their trust. In addition, they advocated that support for newly graduated veterinarians should consist of regular and credible performance feedback and a suitable programme for 'Continuous Professional Development'. However, their results also revealed

that one in five new graduates still faced great problems in evaluating their own progress after 6 years experience and some difficulties (i.e. communicating with colleagues and coping with workload) were as great or even greater for experienced vets. Apparently the increased experience is not always sufficient to overcome difficulties. Rhind et al. (2011) investigated personal attributes that ease graduates transition into veterinary practice. Recent graduates and final year students of three veterinary schools in the UK were asked to rate 42 individual attributes on a 5 point Likert scale. Results showed a high level of agreement with respect to the importance of non-technical attributes like communication skills, problem solving and decision-making skills, recognition of own limitations and the ability to cope with pressure. Recent graduates reflected that a focus on knowledge based attributes became less important once in practice when compared to the their opinion as final year student. Research within medical health professions reveals similar results: A study on 'preparedness for practice' showed that junior doctors felt insufficiently prepared to perform required tasks (Matheson & Matheson, 2009). They felt they had not been adequately trained neither in the management aspects of the job nor in communication skills and perceived a lack of support from staff (Teunissen & Westerman, 2011). In a qualitative study Westerman et al. (2010) investigated what factors were perceived as salient when residents moved to a position as an attending physician. Three important themes, interacting in a longitudinal process, emerged from their study: The first theme, disruptive new elements, deals with identified differences in relation to the new tasks the attending physicians were supposed to carry out, the roles in which they had to act, and a new context both at work and at home. The second theme related to the way the attending physician perceived and coped with these differences and the third theme concerned how the former themes directed their personal development and the outcomes. Based on the first theme they propose to minimize disruptive new elements in the transition by adapting training to the requirements of practice. This is in line with a study among alumni of the Faculty of Veterinary Medicine in the Netherlands, in which the suggestion was made that more attention needs to be paid to gaining experience with practical and technical aspects of the job and to managerial and communication skills (Jaarsma et al., 2008). With the aim of meeting this requirement and providing veterinary medical educators with guidelines for developing education and assessment programs that match the requirements of present day veterinary practice, an integrated veterinary competency framework reflecting the full scope of present day veterinary professional practice was developed (Bok, Jaarsma, Teunissen, van der Vleuten, & van Beukelen, 2011). The competency framework consists of eighteen competencies categorized into seven domains and is validated in ten countries (Bok et al., in press). The domains are

veterinary expertise, communication, collaboration, entrepreneurship, health and welfare, scholarship and personal development. Development as a professional requires the integration of all competencies in the seven domains. While the first important theme mentioned in Westerman's study emphasizes the responsibility of the educator, and the employer, the second and third theme of that study stresses the role of the person. Research on these personal aspects that predict the course of the transition period in health care professionals is scarce. It may be very helpful to identify personal characteristics that improve mental well-being during transition because they are developable and or trainable to a greater or lesser extent, and can be used across situations. This means that these personal aspects will be beneficial in improving work-related well-being, irrespective of where an individual starts working. We may therefore conclude that it is important that, in addition to aspects of work and work-environment, personal aspects should be included in research on mental well-being of medical and veterinary professionals.

With the aim of further exploring the benefits and antecedents of positive mental well-being, this thesis covers studies that explore what work- and person related characteristics would promote mental well-being of veterinary professionals. As we want to base this research firmly in a suitable and valid theoretical framework that enables balancing of positive and negative effects related to the work of veterinarians, we have to broaden our perspective to that of organizational psychology.

A psychological perspective on mental well-being

During the past decades several influential job stress models have been used to predict job stress. The three most influential job stress models are the Job Demand - Control model (Karasek, 1979), the Effort - Reward Imbalance model (Siegrist, 1996) and the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti, Bakker, De Jonge, Janssen, & Schaufeli, 2001). The Job Demand - Control model and the Effort - Reward Imbalance model focus primarily on negative mental well-being (i.e. ill health, strain, or burnout) and both models have restrictions with regard to the set of predictor variables that are assessed and that may not be equally relevant for all occupations. Unlike other models the JD-R model permits the incorporation of many possible working conditions and focuses on both negative and positive indicators of employee well-being. The central assumption of the JD-R model is that although the specific work characteristics of various occupations may differ, they can be modelled in two broad categories, namely job demands and job resources, thus constituting a model that may be tailored to a specific occupational setting. *Job demands* refer to those physical, psychological, social, or organizational aspects of the job that require sustained physical or mental effort, and are therefore

associated with certain physiological and psychological costs. Examples are high workload, poor working circumstances and emotional demands. *Job resources* refer to those physical, psychological, social, or organizational aspects of the job that **(a)** are functional in achieving work goals, **(b)** reduce job demands and the associated physiological and psychological costs, or **(c)** stimulate personal growth and development (Bakker & Demerouti, 2007).
A second assumption of the JD-R model is that these job demands and job resources evoke two relatively independent psychological processes that determine employee well-being: the negative health impairment process and the positive motivational process. According to the health impairment process high job demands may exhaust employees' mental and physical resources and may therefore lead to energy depletion and to health problems (Demerouti, Nachreiner, Bakker, & Schaufeli, 2001). Exhaustion and health complaints have been studied as a typical outcome of the health impairment process (Bakker, Demerouti, & Schaufeli, 2003; Demerouti et al., 2001). Secondly, according to the motivational process, the availability of job resources has motivational potential and leads to commitment, work engagement and high performance (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). Work engagement is defined as a positive, fulfilling, work-related state of mind that is characterized by vigour, dedication to one's work, and by absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002). Vigour is characterized as high levels of energy and mental resilience while working. Dedication refers to being strongly involved in one's work and experiencing a sense of significance, enthusiasm, pride and challenge. Absorption is characterized by being fully concentrated and happily engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work.

Recently the JD-R model has been extended to include personal resources. *Personal resources* are those aspects of the self that are generally linked to resiliency and refer to individuals' sense of their ability to control their environment successfully (Hobfoll, Johnson, Ennis, & Jackson, 2003). According to Hobfoll (1989) people strive to obtain, retain, protect and foster resources and when people develop resource surplus, they are likely to experience positive well-being. Individuals with poor personal resources or who are poorly equipped to gain resources are likely to be particularly vulnerable (Hobfoll, 1989). Several studies have focused on personal factors as predictors of engagement. Examples of personal characteristics that contribute to explaining variance in work engagement over time are personality traits like low neuroticism, high extraversion (Langelaan, Bakker, van Doornen, & Schaufeli, 2006) and conscientiousness (Mostert & Rothmann, 2006) and more manageable state-like personal resources like self-efficacy, organizational-based self-esteem, optimism

(Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007) and proactive personality (Dikkers, Jansen, de Lange, Vinkenburg, & Kooij, 2010).

Summarized, the JD-R model provides us with a model that allows us to measure burnout and engagement as a result of respectively the negative health impairment and the positive motivational process. It allows us to measure levels of multiple specific work-related demands and work- and person related resources that are characteristic of veterinary professionals in the first years after graduation. The modelling of work characteristics into two broad categories (job demands and job resources) might be at the basis of the successful application of the JD-R model for different sectors and job positions and as such it is also applicable for other jobs in the health care sector. For these reasons, our studies have been conducted with the JD-R model as theoretical background.

Aim of this thesis and research questions

The aim of this thesis is to identify the job characteristics (job demands and resources) as well as personal resources that affect mental well-being (burnout and work engagement) and performance in recently graduated veterinary professionals, and to reach a greater understanding of the role of personal resources in their well-being. The central research questions within this thesis are:

1. What are the levels of burnout and work engagement of veterinarians graduated in the past 10 years, and do these levels vary with gender or number of years since graduation?
2. Which job characteristics (job demands and resources) and personal resources predict burnout and work engagement in male and female veterinarians in the first five years after graduation?
3. What is the role of personal resources in explaining burnout, work engagement and performance?
4. How can personal resources be developed?

Roadmap

The first and second research question will be addressed in chapters 2 and 3. In chapter 2, the construction of a questionnaire (Vet-DRQ), adapted to the occupational group (i.e. veterinary professionals) under study, is presented. The questionnaire has been constructed in two phases: a qualitative phase with semi-structured group interviews,

and a quantitative phase in which the preliminary questionnaire is validated. Chapter 3 includes the results of the questionnaire study on mental well-being and its predictors among all Dutch veterinary professionals who graduated between 1999 and 2009. Research question 3 is addressed in chapter 4. Within this study several hypotheses concerning the role of personal resources in mental well-being were formulated and tested by using a structural equation modelling approach. Chapter 5 addresses research question 4 and concerns a study with a mixed methods design, that aims to gain insight into how personal resources develop during and after a one-year development programme for veterinary professionals who graduated between one and four years previously. The quantitative part of the study assesses whether job and personal resources and work engagement have increased during the intervention. Besides, multiple interviews have been conducted with the aim of acquiring insight into the developmental process of personal resources during the intervention and its effects on job resources and work engagement. Finally, in chapter 6 the main results and conclusions that can be drawn from the different studies are presented and several topics covered in this thesis are discussed in conjunction. Furthermore this chapter discusses the strengths and limitations of this research project, the possible implications for professional and educational practice and finally some suggestions for future research. Hopefully this thesis will help to improve the well-being of health care professionals, through an increased insight in the role of personal resources that might help them staying engaged.

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CHAPTER 2

Measuring potential predictors of burnout and engagement among young veterinary professionals

Construction of a customized questionnaire

(the Vet-DRQ)

Authors
N.J.J.M. Mastenbroek, E. Demerouti, P. van Beukelen, A.M.M.A. Muijtjens, A.J.J.A. Scherpbier, A.D.C. Jaarsma

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Abstract

The Job Demands-Resources model (JD-R model) was used as the theoretical basis of a tailor-made questionnaire to measure the psychosocial work environment and personal resources of recently graduated veterinary professionals. According to the JD-R model two broad categories of work characteristics that determine employee well-being can be distinguished: job demands and job resources. Recently the JD-R model has been expanded by integrating personal resource measures into the model. Three semi-structured group interviews with veterinarians active in different work domains were conducted to identify relevant job demands, job resources and personal resources. These demands and resources were organized in themes (constructs). For measurement purposes, a set of questions ('a priori scale') was selected from the literature for each theme. The full set of a priori scales was included in a questionnaire that was administered to 1760 veterinary professionals. Exploratory factor analysis and reliability analysis were conducted to arrive at the final set of validated scales (final scales). Eight hundred and sixty veterinarians (73% females) participated. The final set of scales consisted of seven job demands scales (32 items), nine job resources scales (41 items), and six personal resources scales (26 items) which were considered to represent the most relevant potential predictors of work-related well-being in this occupational group.

The procedure resulted in a tailor-made questionnaire: the Veterinary Job Demands and Resources Questionnaire (Vet-DRQ). The use of valid theory and validated scales enhances opportunities for comparative national and international research.

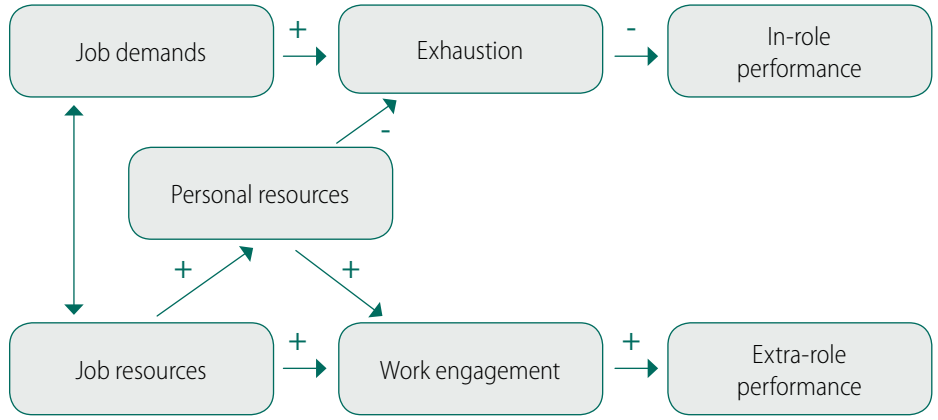
Introduction

Recent studies in the UK (Bartram, Yadegarfar, & Baldwin, 2009), Australia (Meehan & Bradley, 2007; Fritschi, Morrison, Shirangi, & Day, 2009), New Zealand (Gardner & Hini, 2006), Finland (Reijula et al., 2003) and Belgium (Hansez, Schins, & Rollin, 2008) have investigated the psychological well-being of veterinary professionals. The quality of most studies of suicidal behaviour and psychosocial problems in veterinary surgeons is relatively low, partly due to a lack of appropriate measures preventing inter-population comparisons (Platt, Hawton, Simkin, & Mellanby, 2012). To remedy this, a theory-based questionnaire was developed and validated to measure predictors of work-related well-being in recently graduated veterinary professionals. In developing the questionnaire two problems, inherent in questionnaires for measuring aspects of the psychosocial work environment in veterinary and other occupational settings, were sought to avoid: excessive length due to the inclusion of numerous predictors of work-related well-being and a primarily negative perspective on well-being. The dilemma of lengthy and hence time consuming questionnaires versus incomplete representation of important work-related characteristics can be resolved if a questionnaire is tailored to a specific job function by exclusively including predictors with relevance to that function. The emphasis on negative effects of work characteristics can be addressed by focusing also on positive characteristics (Bakker & Schaufeli, 2008) and by research on positive organizational behaviour to determine which working conditions inspire employees to become and stay engaged, give their best, and persist in the face of difficulties. There is currently increasing attention for the role of traits, states, and behaviour of employees in organizations (Judge, Van Vianen, & De Pater, 2004; Luthans & Youssef, 2007; Luthans, Avolio, Avey, & Norman, 2007) and how these relate to work-related well-being (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009a; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009b).

The Job Demands-Resources model (JD-R model) (Demerouti, Nachreiner, Bakker, & Schaufeli, 2001) provided the theoretical perspective for the development of the questionnaire. Unlike other influential job stress models (Karasek 1979; Siegrist 1996) the JD-R model permits the incorporation of many possible working conditions and focuses on both negative and positive indicators of employee well-being. The successful application of the JD-R model for different sectors and job-positions (Bakker & Demerouti, 2007) may be due to the modelling of work characteristics into two broad categories: job demands evoking an energy depletion process and job resources evoking a motivational process. The central notion of the JD-R model is that job demands and job resources evoke two relatively independent psychological processes that determine employee well-being (Bakker, Demerouti,

& Verbeke, 2004; Schaufeli & Bakker, 2004). *Job demands* are aspects of work that require sustained mental and/or physical effort on the part of the employee and are thus associated with psycho-physiological costs. Examples are work overload, work-home interference, shift work, and role ambiguity. *Job resources* on the other hand are work aspects that are functional in achieving work goals by helping employees deal with high job demands but also important in their own right as stimulants of personal growth (Bakker and others 2005). Examples are: autonomy, social support, and career opportunities. Job demands evoke an *energy depletion process* which may ultimately result in burnout, whereas job resources induce a *motivational process* that can result in engagement with work (Bakker & Demerouti, 2007). Burnout is usually defined as a syndrome of exhaustion, cynicism, and lack of professional efficacy (Maslach, Schaufeli, & Leiter, 2001). Work engagement is defined as a positive and fulfilling work-related state of mind characterized by vigour, dedication, and absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002). The main assumptions of the JD-R model have been confirmed in cross-sectional (Bakker & Demerouti, 2007) and longitudinal studies (Demerouti, Le Blanc, Bakker, Schaufeli, & Hox, 2009). In recent years the model has been extended by the integration of personal resources and performance measures (Mastenbroek, Jaarsma, Scherpbier, van Beukelen, & Demerouti, 2014; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009a; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009b). *Personal resources* are aspects of the self that are generally linked to resilience and refer to people's sense of being in control and able to influence their environment successfully (Hobfoll, Johnson, Ennis, & Jackson, 2003). This definition includes feeling appreciated and in control as well as skills and attitudes that support these feelings. Personal resources explained part of the variance in exhaustion and work engagement by partially mediating the relationship between job resources and work engagement and by fully mediating the relationship between job resources and exhaustion (Xanthopoulou et al., 2007). In the JD-R model personal resources not only act as mediators but also impact directly and indirectly (through work engagement) on in-role (task-oriented) and extra-role (organization-oriented) performance (Mastenbroek et al., 2014). As personal resources have been found to be trainable (Demerouti, van Eeuwijk, Snelder, & Wild, 2011), their inclusion in the questionnaire allows for the development of interventions using an integrated approach. The relations in the extended JD-R model are represented in Figure 1.

FIGURE 1 The extended Job Demands - Resources Model (Mastenbroek et al., 2014)



Based on the relevant literature from the past decade, the aim was to design an instrument that would enable:

1 valid measurement of health-related and motivational job characteristics
2 valid measurement of the influence of personal resources on work-related well-being

and that could be:

3 used for the development and evaluation of interventions to improve work-related well-being
4 used for bench-marking (in terms of work characteristics, personal resources, and well-being) between different organizations or work domains.

Method

Setting

After successfully completing the six-year undergraduate curriculum veterinary graduates in the Netherlands are licensed to work in all veterinary work domains, such as veterinary practice (all kinds of animals), food and drug administration, government, research, education, and industry. Many veterinarians experience the transition from student to fully-fledged professional as a period of rapid personal and professional development, accompanied by elevated stress levels and negative emotions (Bogg, Gibbs, & Bundred, 2001; Brennan et al., 2010; Teunissen & Westerman, 2011). The aim of this study is the construction of a validated questionnaire that assesses job

and personal characteristics predicting mental health and well-being in recently graduated veterinary professionals working in different work domains. In order to make sure that the questionnaire captured a variety of relevant work characteristics, group interviews were conducted with veterinarians working in different domains.

Procedure

The JD-R model was used in a two-stage study (Bakker & Demerouti, 2007). In the first, qualitative phase veterinarians from different work domains took part in semi-structured group interviews, which were guided by open questions about positive and negative job aspects to enable identification of relevant job demands and resources. In the second phase, job demands and job resources potentially associated with burnout or engagement were operationalized in scales which were incorporated into a questionnaire.

First qualitative phase

Participants

Twenty-three veterinarians having graduated between 1999 and 2009 and working in different domains were invited to participate in semi-structured group interviews. Due to planning difficulties and illness (two participants), only thirteen veterinarians, eight women and five men, attended the session. Mean number of years since graduation was 3.9 years (sd = 2.2). Eight participants worked in veterinary practice (six in companion animal practice, one in large animal practice and one in mixed (large animals and horses) practice), four in business, and one in research and education (Faculty of Veterinary Medicine). The participants were allocated to three groups, which were mixed with regard to gender and occupation.

Semi-structured group interviews

The interviewer (first author NM) asked three pre-set questions supplemented by further questions to clarify what participants meant. The questions were:

1. Which aspects of your work can be regarded as psychological or physiological demands?
2. Which aspects of your job can be regarded as resources?
3. Which personal qualities, skills, or behaviours can help you cope with the demands of your work and/or generate resources?

After the participants were asked to take a few minutes to think about a question and write down their thoughts, the interviewer invited them to share their answers with the group. After agreement was reached on what participants meant the interviewer (first author NM) wrote the answers on the whiteboard, and this procedure was repeated for each of the three questions, each time continuing until saturation was

reached, i.e. no new notions or ideas were put forward. The interviews were audio recorded. The first author (NM) listened to the tapes in order to verify whether all the notions and ideas put forward by the participants were included in the list. Thirty percent of the tapes were double-checked by one of the other authors (DJ). After the interviews, the first and the second author (NM and ED) grouped aspects by topic. Collegiality, conflicts with colleagues, and good colleagues, for example, were grouped under team aspects. This resulted in a *longlist* of psychological and physiological job demands, energetic benefits of work (job resources), and beneficial personal traits, states, and behaviours (personal resources).

Cross-checking and prioritization

Within two weeks after the interviews, the longlist was emailed to the thirteen participants and ten non-participants. They were asked to check if the interview summary was accurate (participants) and complete (participants and non-participants), and to prioritize the five most important job demands, job resources, and personal resources on the list. The prioritized demands and resources were included in a *shortlist* (longlist and shortlist are available from the first author).

Second phase: operationalization of demands and resources

The first and second author organized the prioritized demands and resources into work-psychological constructs by relating them to constructs from the literature on work environment, personal skills, and qualities that influence work-related well-being. The term construct is used to denote to a complex psychological concept which is not directly observable or quantifiable and can therefore not be measured directly (e.g. anger, support, work-home balance). Indirect assessment of constructs is accomplished through the use of scales. A scale is a collection of questions intended to identify and quantify a non-observable construct. Validated scales (a priori scales) were selected to measure these constructs. This resulted in a preliminary questionnaire.

The final questionnaire

Pre-test

Five veterinarians of the Faculty of Veterinary Medicine who were not involved in the study tested the preliminary questionnaire to ensure that items were:

1. comprehensible to the target population;
2. unambiguous; and
3. contained only a single question.

Questionnaire mailing
In March 2009, the questionnaire was emailed to all veterinarians graduated from the Faculty of Veterinary Medicine, Utrecht University, the Netherlands between 1999 and 2009 (N=1760). Reminders were sent after two and four weeks. Email addresses were obtained from the database of the Royal Netherlands Veterinary Association (RVNA). This database contains addresses of all veterinarians who have graduated in the Netherlands.

Exploratory factor analysis
Exploratory factor analysis at item level was performed for identifying clusters of items (factors) which form an underlying variable corresponding with job demands, job resources, and personal resources. Factors were extracted using principal components analysis and direct oblimin rotation to account for correlations between factors. The number of factors extracted was based on Kaiser's criterion (retaining factors with eigenvalues >1) and inspection of the scree plot. Missing values were excluded pairwise. Items with factor scores > 0.4 and differences between cross loadings > 0.1 were retained. SPSS 16 software package was used for the analysis (Field, 2013).

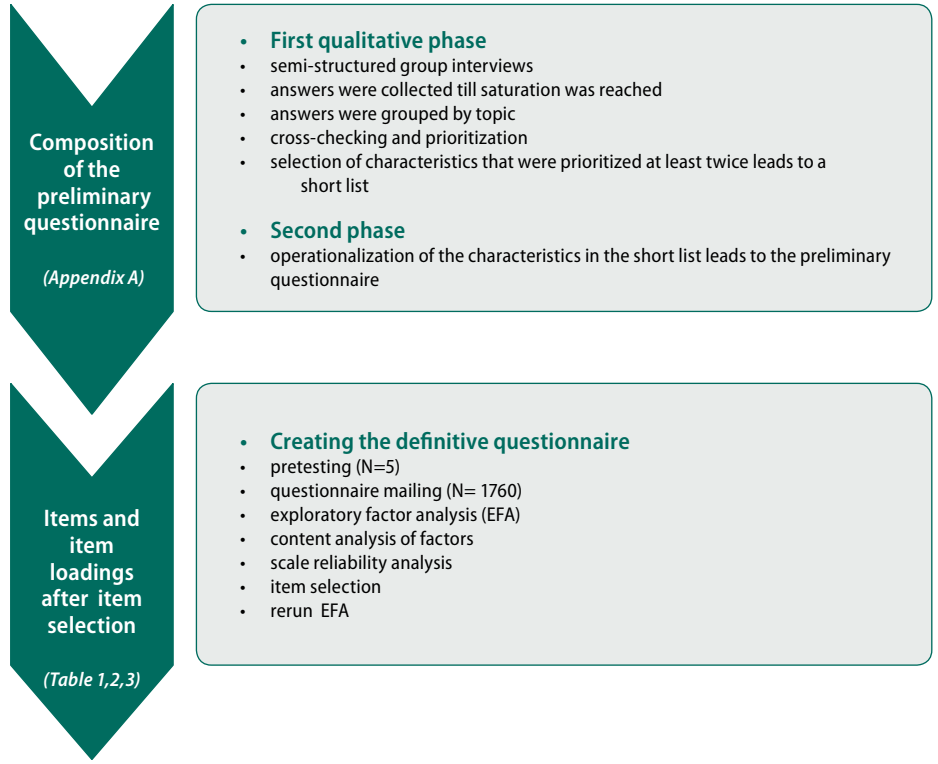
Content validation of new factors
New clusters of items (other than the validated a priori scales) were analysed for their interpretability as a meaningful scale.

Reliability of the scales
Internal consistency of the factors was determined by calculating Cronbach's alpha, with alpha >.70 considered acceptable. Items were inspected for their contribution to Cronbach's alpha: when deletion of one or more items caused Cronbach's alpha to increase and content analysis made deletion plausible, item deletion was considered. Items phrased oppositely to other items on the scale were reverse scored when the scale score was calculated and reliability analysed. The process of the development of the questionnaire is summarized in Figure 2.

Results

Qualitative phase
Appendix A shows the scale construction of the preliminary questionnaire, the sources of the scales, and the number of items per scale. The questionnaire included also background information on demographics and occupational data, such as age, gender, years since graduation, work domain, and employment.

FIGURE 2 Development of the Veterinary Demands and Resources Questionnaire (Vet-DRQ)



Creating the definitive questionnaire
Pre-test
Pretesting resulted in minor adjustments in the wording of some items. Items that were judged to be inapplicable to the target group or formulated both positively and negatively were deleted.

Email questionnaire
Of 1760 questionnaires sent out by personalized email, 860 were returned. Of these, 133 were incomplete and therefore not included in the study (response 41%). Of the respondents 73% was female, the mean age was 32 years (sd =4.4), and employment domains were veterinary practice (77%), research and education (13 %), industry (6 %), government (3%), and non-specified jobs (1%). These figures are comparable to those for all the graduates invited to participate.

Exploratory factor analysis, content analysis, and reliability analysis of the scales

Job demands

Inspection of the scree plot resulted in eight factors and Kaiser's criterion left seven factors with eigenvalue > 1. One factor with an eigenvalue of 8.8 (accounting for 25% of variance), six factors with eigenvalue < 3.3, and one factor with an eigenvalue of 0.99 together explained 64.3% of the variance. One factor consisting of one item ('how often does it happen that you work standing up') from the a priori scale 'working circumstances' was deleted. In the next step another item from the scale 'working circumstances' ('how often does it happen that you perform your work in a physically uncomfortable environment') was deleted because cross loadings on other factors differed < 0.1 from the major loading. Content analysis of seven factors resulting from repeated factor analysis revealed that the items loading on these factors perfectly matched the a priori scales. This resulted in the final scales Task Ambiguity, Workload, Physical Demands, Job Insecurity, Working Circumstances, Work-Home Interference, and Role Conflicts, with alphas > .70. Factors and major factor loadings after item deletion are shown in Table 1 and descriptive statistics of the final scales are shown in Table 4.

TABLE 1 Validation of the job demands questionnaire: factors (F1-F7) relating to job demands and standardized factor loadings of 32 items resulting from exploratory factor analysis of data obtained from Dutch veterinarians having graduated between 1999 and 2009 (N = 727)

FACTORS	FACTOR LOADINGS
F1: TASK AMBIGUITY	
Do you know exactly what your responsibilities are?	-.82
Is it clear to you exactly what your task is?	-.82
Do you know exactly what you can expect from the other people in your organization?	-.81
Do you know exactly what others at your work expect of you?	-.75
Do you know exactly what your immediate superior thinks of your performance?	-.69
F2: WORKLOAD	
Do you have too much work to do?	.80
Do you need to work extra hard to get something done?	.76
Do you have to work very fast?	.74
Can you do your work at your own speed?	-.68
Do you have too little work?	-.66

TABLE 1 Continued

FACTORS	FACTOR LOADINGS
Do you have to deal with a backlog in your work?	.58
F3: PHYSICAL DEMANDS	
Do you work in awkward or strenuous positions?	.77
Is your work physically strenuous?	.77
Are you bothered in your work by regularly having to reach too high?	.72
Are you bothered in your work by long-lasting repetitive movements?	.65
Are you bothered in your work by heavy lifting or carrying?	.68
F4: JOB INSECURITY	
Do you need more guarantees as to whether or not you will still have your current job next year?	.91
Do you need more guarantees as to whether or not you will still have the same function level next year?	.88
Do you need more guarantees as to whether or not you will still have a job next year?	.87
Do you need more guarantees concerning your career opportunities?	.62
F5: WORKING CIRCUMSTANCES	
How often do you have to:	
Perform without adequate technical resources?	.90
Work with faulty equipment?	.85
Work in an unsuitable environment?	.69
Perform your work without adequate support?	.56
F6: WORK-HOME INTERFERENCE	
How often does it happen that:	
You neglect your personal life because your work always occupies your thoughts?	.88
You think of things you have to do for your work, while you are occupied with your personal life?	.86
You don't enjoy your personal life enough because you are brooding about your work?	.82
Your working hours make it difficult to find time for your personal life?	.58
F7: ROLE CONFLICTS	
Do you have to carry out your work in a different way than you would prefer?	.76
Do you have conflicts with your immediate superior concerning the type of tasks?	.71
Do you have to carry out work that you would prefer not to do?	.69
Do you receive conflicting orders?	.68

TABLE 2 Validation of the job resources questionnaire: factors (F1-F9) relating to job resources and standardized factor loadings of 41 items resulting from exploratory factor analysis of data obtained from Dutch veterinarians having graduated between 1999 and 2009 (N= 727)

FACTORS	FACTOR LOADINGS
F1: DECISION AUTHORITY	
Do you have direct influence on decision making within your organization?	.86
Do you have influence on the distribution of work among you and your colleagues?	.76
Are you involved in decisions about the type of work you do?	.73
Are you involved in decisions about matters concerning your work?	.72
Are you involved in determining what your work does and does not involve?	.71
F2: SUPPORT FROM COLLEAGUES	
Are you on good terms with your colleagues?	-.86
Is there a pleasant atmosphere between you and your colleagues?	-.85
Can you talk about work-related problems with your colleagues?	-.78
Do you feel appreciated at work by your colleagues?	-.75
Can you ask your colleagues for help if necessary?	-.66
F3: SKILLS DISCRETION	
Does your work require creativity?	.88
Does your work require personal input?	.79
Do you have sufficient variety in your work?	.59
Does your work make enough demands on all your skills and abilities?	.56
F4: REWARDS	
In my company good salaries are paid.	.86
I am paid enough for the work I do.	.82
I can manage well on my salary.	.70
I think that salaries in my company are lower than in similar companies.	-.68
I am paid fairly compared with others in my company.	.64
F5: FEEDBACK FROM WORK	
Does your work offer you direct feedback about how well you perform?	.84
Does your work offer you opportunities to discover how well you perform?	.77
Do your colleagues give you feedback about how well you perform?	.69
Do you get enough feedback about the results of your work?	.72

TABLE 2 Continued

FACTORS	FACTOR LOADINGS
F6: DECISION LATITUDE	
Can you take a break if you need to?	-.85
Can you organize your work yourself?	-.83
Can you influence work schedules?	-.75
Can you influence the pace of work?	-.68
Can you choose which tasks you carry out?	-.61
Can you decide yourself how you carry out your work?	-.50
F7: CONFLICTS AT WORK	
Are there annoying incidents between you and your superior?	.78
Are there annoying incidents between you and your colleagues?	.74
Do you have conflicts with your superior?	.69
F8: SUPPORT FROM SUPERIOR	
When there are problems at work can you discuss them?	.85
Can you ask your superior for help when necessary?	.82
Can you discuss your work sufficiently with your immediate superior?	.82
Are you on good terms with your superior?	.81
Is there a good atmosphere between you and your superior?	.77
Do you feel appreciated at work by your superior?	.72
F9: POSSIBILITIES FOR PROFESSIONAL DEVELOPMENT	
My work offers me opportunities for continuing learning.	.79
I have opportunities to develop my strengths at work.	.77
I can develop myself sufficiently in my organization.	.74

Job resources

The analysis of job resources resulted in nine factors with eigenvalue > 1. One factor with an eigenvalue of 13.3 (accounting for 30.9% of variance) and eight factors with eigenvalues ≤ 4.3 together explained 71% of the variance. The item 'do you have enough opportunities to consult your superior about your work' from the a priori scale 'decision authority' loaded on factor 5 ('support from superior'). Considering that this item perfectly matched the other items of factor 5 and after checking the consequences for scale reliability, this item was added to factor 5. The item 'do you often need to perform the same activities in your work?' was deleted because its

major factor loading was < 0.4. The item 'does your superior give you information on how well you are doing in your work?' had high factor loadings on factors 5 and 6 while the difference was < 0.1. After the consequences for scale reliability were checked, the item was deleted. Factor analysis revealed one new factor consisting of two items from the a priori scale 'support from superior' and one item from the a priori scale 'support from colleagues'. Content validation showed that these items related to conflicts at work. Since content validation of the other factors revealed a match with the a priori scales, the corresponding scale labels were retained: Decision Authority, Support from Colleagues, Possibilities for Professional Development, Rewards, Support from Superior, Feedback from Work, Decision Latitude, Conflicts at Work, and Skills Discretion. Alpha coefficients were all ≥.75. Factor loadings after item deletion and descriptive statistics of the final scales are shown in Tables 2 and 4, respectively.

Personal resources

The analysis of personal resources resulted in eight factors with eigenvalue > 1. One factor with an eigenvalue of 7.2 (accounting for 22.3% of variance) and seven factors with eigenvalue < 2.5 together explained 58.4% of variance. Three items had factor loadings < 0.4: one item from the scale 'self-efficacy' ('whatever happens, I will manage'), one item from the scale 'assertiveness' ('I have avoided asking questions because I was afraid to seem ignorant'), and one item from the scale 'proactive behaviour' ('when I have a problem, I tackle it head-on'). One item from the scale proactive behaviour ('if I see something I don't like, I will fix it') loaded on two factors with factor loadings differing < 0.1. Since the contributions of these four items to scale reliability were negligible, they were removed. Repeated factor analysis and analysis of scale reliability were performed. Factors 4 and 7 were originally selected from the a priori scale 'assertiveness' on the basis of face validity. Content analysis and scale reliability analysis showed that combining the items of these factors yielded a scale containing six items relating to assertiveness with Cronbach's alpha .71, which is comparable with the alphas of factors 4 (.70) and 7 (.69). Considering its low Cronbach's alpha (.43), factor 8 was not included in the final factor analysis. The final scales were: Proactive Behaviour, Reflective Behaviour, Thoughtfulness, Optimism, Assertiveness, and Self-efficacy, all with alphas ≥ .70. Results of the factor analysis after item deletion are shown in Table 3. Descriptive statistics of the final scales are shown in Table 4.

TABLE 3 Validation of the personal resources questionnaire: factors (F1-F7) relating to personal resources and standardized factor loadings of 26 items resulting from exploratory factor analysis of data obtained from Dutch veterinarians having graduated between 1999 and 2009 (N= 727) *Page 37* ▶

FACTORS	FACTOR LOADINGS
F1: SELF-EFFICACY	
When I find myself in a difficult situation, I usually know what to do.	.78
When I am confronted with a problem, I usually have more than one solution.	.71
I am confident that I approach unexpected events effectively.	.57
F2: OPTIMISM	
Generally, I assume that more positive than negative things will happen to me.	-.79
I seldom assume that something pleasant will happen to me.	.73
I am always optimistic about my future.	-.71
Whenever something can go wrong, it will happen to me.	.65
In times of uncertainty I always expect the best.	-.63
Things never go the way I want.	.50
F3: REFLECTIVE BEHAVIOUR	
I am aware of the emotions that influence my actions.	-.93
I am aware of the emotions that influence my thinking.	-.92
I can consider my own behaviour objectively.	-.78
F4: SHYNESS	
I often have a hard time saying "No".	.87
To be honest, people often take advantage of me.	.85
F5: THOUGHTFULNESS	
I want to know why I do what I do.	-.87
I think it is important to know what certain rules and guidelines are based on.	-.84
F6: PROACTIVE BEHAVIOUR	
I see a good chance long before others do.	-.61
I am always looking for better ways to do things.	-.60
Nothing is more exciting than seeing my ideas become reality.	-.64
Everywhere I go I am a strong force for constructive change.	-.53
I am very good at converting threats into opportunities.	-.51
If I believe in an idea then nothing will stop me from realizing it.	-.58
F7: ASSERTIVENESS	
If anyone is attempting to push ahead of me in a line, I will immediately say something.	.71
I am quick to express my opinion.	.68
If someone has been spreading false and bad stories about me, I see him or her as soon as possible to "have a talk" about it.	.65
I have hesitated to make or accept dates because of shyness.	-.46

TABLE 4 Descriptive statistics for factors relating to job demands, job resources and personal resources resulting from the analysis of data obtained from Dutch veterinarians having graduated between 1999 and 2009 (N= 727)

	N	NO. OF ITEMS	M (SD)	ALPHA
JOB DEMANDS				
Task ambiguity	651	5	17.73 (3.84)	.86
Workload	727	6	17.64 (3.73)	.84
Physical demands	727	5	9.39 (2.97)	.80
Job insecurity	727	4	9.87 (4.52)	.84
Working circumstances	727	4	7.41 (2.42)	.80
Work-home interference	727	4	9.68 (3.25)	.84
Role conflicts	755	4	7.05 (2,26)	.78
JOB RESOURCES				
Decision authority	727	5	14.43 (5.30)	.93
Support from colleague	727	5	19.54 (4.15)	.90
Skills discretion	727	4	13.65 (2.93)	.82
Rewards	727	5	16.30 (3.77)	.81
Feedback from work	727	4	11.50 (3.08)	.83
Decision latitude	727	6	17.67 (5.34)	.89
Conflicts at work	656	3	5.14 (1.76)	.75
Support from superior	650	6	21.72 (5.99)	.94
Possibilities for professional development	727	3	10.94 (2.56)	.89
PERSONAL RESOURCES				
Self-efficacy	727	3	11.11 (1.63)	.74
Optimism	727	6	22.38 (3.41)	.80
Reflective behaviour	727	3	11.03 (1.78)	.84
Thoughtfulness	727	2	7.97 (1.21)	.72
Proactive behaviour	727	6	19.78 (2.98)	.75
Assertiveness (F4 + F7)	727	6	23.03 (4.79)	.71

Discussion

In this study a theory-based and tailor-made questionnaire was constructed to measure the psychosocial work environment and personal resources with a potential effect on work-related well-being in young veterinary professionals. Specific characteristics of the procedure followed will be discussed and its strengths and weaknesses will be considered.

A systematic design to facilitate future research

Today, much of the research on predictors of work-related well-being in veterinary and medical professionals is not based on work-psychological theory. In constructing the new questionnaire a *valid theory* was used to define the concept of work-related well-being and its relationships with predictors. In the *qualitative phase* of the questionnaire construction potential predictors for specific jobs, work domains, organizations, cultures, and age groups were identified, thereby enabling a reduction of the number of potential predictors while maintaining the most important and job specific predictors for different job functions. *Validated multi-item scales* were used to facilitate comparisons with other occupations or populations. As a consequence of this procedure the questionnaire includes no single item questions such as emotional conflicts when dealing with double loyalty (i.e. demanding client and animal well-being) or working overtime when you are supposed to collect a child from school. When such items were on the shortlist, they were allocated to themes (constructs), such as role-conflicts and work-home interference, in the second phase.

A balanced approach

Using the JD-R model to guide the construction process enabled the development of a questionnaire to measure and integrate not only health impairment processes but also motivational processes. This characteristic of the questionnaire is of the greatest importance, because it enables a focus on decreasing job demands, increasing job resources, or increasing personal resources, which makes the questionnaire suitable to provide information to guide interventions. This permits an integrated approach.

In developing the questionnaire using the JD-R model it was sometimes difficult to ascertain if a work characteristic represented a job demand or a lack of job resources. Resources are not only functional in achieving work goals but also necessary for dealing with high job demands. A lack of resources is a barrier to coping with job demands. To illustrate this, the example of 'lack of vision' is discussed. Lack of vision, which can result in unsatisfactory progress in an organization, was perceived by

interviewees as a work aspect representing a psychological demand. If someone is authorized to take decisions, he/she can cope with a perceived problem and decide to change practice management. From this point of view a lack of decision authority can be interpreted as a demand, whereas in terms of the model it is interpreted as a resource shortage. Another example is 'imbalance between rewards, investments, responsibilities, and work', which interviewees perceived as a psychological demand. According to the Effort-Reward Imbalance Model (Siegrist 1996) however, work characterized by high effort and low rewards is characterized by a reciprocity deficit between 'costs' and 'gains', which may elicit negative emotions in employees. Rewards in this context are seen as a gain, a resource. In terms of the model an imbalance between rewards, investments, responsibilities, and work is interpreted as a lack of job resources. These two examples illustrate the problems and ambiguities that might arise in formulating operational definitions of the aspects on the shortlist. It is important to keep in mind that the main difference between demands and resources is that dealing with the former requires effort whereas the latter are motivating and facilitating in character.

Limitations

Although the qualitative phase was a valuable component of the construction process of the questionnaire, the way demands and resources were operationalized into psychological constructs, scales, and items can be regarded as a weakness because it was not an objective procedure and therefore difficult to replicate. The demands proposed by the interviewees had to be interpreted and operationalized at a higher level of abstraction requiring knowledge of psychological concepts and constructs. To give an example: the demand 'dissatisfied clients and complaints' was interpreted as 'feedback from work', which in turn can be interpreted as a job resource to help achieve work goals and personal development. It can be regarded as another limitation and a potential source of bias that the interviewer and first author was one of the two raters who checked the tapes during the first, qualitative phase, while the second rater was another author.

Implications for practice

The questionnaire allows for comparison of findings between different work domains of veterinary professionals and between different countries. It enables interventions to be targeted at three areas: reduction of job demands, enhancement of job resources, and improvement of personal resources. Focusing on job resources and work engagement (positive psychology) offers an opportunity to spotlight positive and engaging aspects of the work of a veterinarian. This is important because over the past decade in particular the focus among veterinary and medical professionals has

been on heavy workload and work-life (dis)balance. In professions that offer services 24 hours a day, seven days a week, it is often easier to increase job resources than to decrease job demands. The questionnaire which was developed based on the JD-R model enables identification of key resources as a target for interventions aimed at enhancing job satisfaction and the image of the profession. The questionnaire can also be deployed by practice managers as a tool in discussing with employees mutual expectations and needs concerning work and work environment. Finally the questionnaire can be of great value for educators. The inclusion of personal resources enables them to determine on which personal resources they should focus in preparing students for work as a veterinary professional.

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APPENDIX A Composition of the preliminary questionnaire

SCALE	RANGE	REFERENCE	NUMBER OF ITEMS
JOB DEMANDS			
Workload	(1) "never" to (5) "always"	*(Van Veldhoven & Meijman, 1994)*	6
Physical demands	1-5	*(Van Veldhoven & Meijman, 1994)*	5
Task ambiguity	1-5	*(Van Veldhoven & Meijman, 1994)*	5
Job insecurity	1-5	*(Van Veldhoven & Meijman, 1994)*	4
Role conflicts	1-5	*(Bergers, Marcelissen, Wolff, Weel, & Winnubst, 1986)*	4
Work-self conflict	1-5	*(Demerouti, Shimazu, Bakker, Shimada & Kawakami, 2013)*	4
Working circumstances	1-5	*(Bakker Demerouti, & Eeuwema, 2005)*	6
JOB RESOURCES			
Decision latitude	1-5	*(Van Veldhoven & Meijman, 1994)*	6
Decision authority	1-5	*(Van Veldhoven & Meijman, 1994)*	6
Skills discretion	1-5	*(Van Veldhoven & Meijman, 1994)*	5
Support from colleagues	1-5	*(Van Veldhoven & Meijman, 1994)*	6
Support from superior	1-5	*(Van Veldhoven & Meijman, 1994)*	7
Rewards	1-5	*(Van Veldhoven & Meijman, 1994)*	5
Possibilities for professional development	1-5	*(Van Veldhoven & Meijman, 1994)*	3
Feedback from work	1-5	*(Van Veldhoven & Meijman, 1994)*	5
PERSONAL RESOURCES			
Assertiveness	(1) "totally disagree" to (5) "totally agree"	*(Rathus, 1973)*	7
Proactive behaviour	(1) "totally disagree" to (5) "totally agree"	*(Bateman & Crant, 1993)*	8
Reflective behaviour	1-5	*(Aukes, Geertsma, Cohen-Schotanus, Zwierstra, & Slaets, 2007)*	7
Optimism	1-5	*(Scheier & Carver, 1985)*	6
Self-efficacy	1-5	*(Schwarzer & Jerusalem, 1995)*	4

CHAPTER 3

Burnout and engagement, and its predictors in young veterinary professionals

The influence of gender

Authors
N.J.J.M. Mastenbroek; .D.C. Jaarsma; E. Demerouti; A.M.M.A. Muijtjens; A.J.J.A. Scherpbier; P. van Beukelen;

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Abstract

With the aim to assess levels of burnout and work engagement in junior veterinarians and identify predictors of burnout and work engagement in male and female veterinarians, 1760 **v**eterinarians who had graduated in the Netherlands between 1999 and 2009, received an electronic questionnaire. 860 veterinarians (73% females) participated. Levels of exhaustion, cynicism and work engagement were significantly lower compared to the norm group (a random sample of the Dutch working population). Male veterinarians were less exhausted and more engaged than female veterinarians. Exhaustion decreased over the years. Job demands positively related to exhaustion were work-home interference and workload. Job resources positively related to work engagement were opportunities for professional development and skills discretion (i.e. the ability to use and develop skills on the job. Personal resources explained more of the variance in work engagement of female and male veterinarians (31% and 42%) than of the variance in exhaustion (19% and 21%) and cynicism (19% and 10%). Personal resources positively related to work engagement were self-efficacy and proactive behaviour. Relative importance analysis revealed differences between men and women in the importance of various job demands, job resources and personal resources in explaining burnout and engagement in young veterinary professionals.

Introduction

In recent years studies in the UK (Bartram, Yadegarfar, & Baldwin, 2009b), Australia (Fritschi, Morrison, Shirangi, & Day, 2009), New Zealand (Gardner & Hini, 2006), Finland (Reijula et al., 2003) and Belgium (Hansez, Schins, & Rollin, 2008) have addressed the psychological well-being of veterinary professionals. The main focus of this research has been on job stress, burnout, mental health disorders like depression and anxiety and the negative impact of job characteristics on mental health and well-being (for a systematic review of suicidal behaviour and psychosocial problems in veterinary surgeons see Platt, Hawton, Simkin, & Mellanby, 2012). Psychological well-being encompasses positive and negative states (Cropanzano & Wright, 2001). Work engagement is emphasized as a key variable in the way veterinary surgeons perceive their work situation (Hansez et al., 2008). These findings are in line with a recent shift in attention towards job aspects with a *positive* effect on performance as opposed to the dominant focus on pathology (Fredrickson, 2003; Seligman & Csikszentmihalyi, 2000; Wright & Cropanzano, 2007). British veterinary surgeons for example indicated that good clinical outcomes, relationships with colleagues and intellectual challenges were important sources of job satisfaction (Bartram, Yadegarfar, & Baldwin, 2009a). Desirous to firmly ground the research of veterinarians' work-related psychological well-being in a theoretical framework that enables balancing of positive and negative effects, we decided to use the job demands-resources model (JD-R model) as the theoretical framework for this study. The JD-R model affords a balanced approach to explaining negative (burnout) as well as positive (work engagement) aspects of work-related well-being through linkage with strain and motivational processes (Bakker & Demerouti, 2007; Demerouti, Nachreiner, Bakker, & Schaufeli, 2001).

Besides job characteristics with specific relevance to veterinarians, such as working hours, work-life balance, professional support and client demands/expectations (Platt et al., 2012), *demographic factors* are also associated with psychological well-being. Several studies found that increasing age, increasing time in current job, increasing number of years since graduation and male gender were associated with fewer signs of distress, anxiety and depression (Fritschi et al., 2009;Bartram et al., 2009a; Fairnie, 2005; Gardner & Hini, 2006). These findings are especially relevant in light of the increased numbers of female students attending veterinary schools as well as female graduates entering the labour market. This is not an exclusively Dutch phenomenon as confirmed by reports noticing the same tendency in the United States, the United Kingdom and other parts of the world (Slater & Slater, 2000). While the cause of this change remains to be clarified, attempts have been

made to identify contributing factors (Lincoln, 2010; Stolz, 2006). Reports of female veterinarians being more susceptible to work-related stress, combined with the current male:female ratio of Dutch veterinary students of 20:80% supported the need to study veterinarians' gender-related differences in well-being and their predictors.

As for the impact of *age and number of years since graduation*, the transition from student to veterinary (or medical) professional represents a period of rapid personal and professional development, characterized by elevated levels of stress (Bogg, Gibbs, & Bundred, 2001; Brennan et al., 2010; Heath, 2008; Teunissen & Westerman, 2011; Tyssen & Vaglum, 2002). It should be noted, however, that apart from a negative interpretation due to increased stress levels, the transition period can also be interpreted positively as challenging, full of learning opportunities and opportunities for high performance (Teunissen and Westerman, 2011). According to work-role transition theory (Nicholson, 1984), entry into a new work role heralds a period of professional growth with adaptation to the new situation followed by the start of a new career phase (Ashforth & Saks, 1995). Because job and personal characteristics influence this adaptation process (Westerman et al., 2010), it is important to identify relevant drivers of psychological well-being with the aim to develop effective interventions to deal with transition problems. This leads us to the following research questions:

1 What are the levels of burnout and work engagement of veterinarians graduated in the past ten years, and do these levels vary with gender or number of years since graduation?

2 Which job and personal characteristics predict burnout and work engagement in male and female veterinarians in the first five years after graduation (the transition period)?

The job demands-resources model

The JD-R model posits two broad categories of work characteristics: job demands and job resources. *Job demands* are aspects of work that require sustained physical or mental effort on the part of the employee and are thus associated with psycho-physiological costs, such as work-home interference, workload, job insecurity and role conflicts. *Job resources* are work aspects that are functional to achieve occupational goals. While necessary to deal with high job demands, they are also important in their own right as stimulants of personal growth (Bakker, Demerouti, & Euwema, 2005). Some examples of job resources addressed in this study are decision latitude

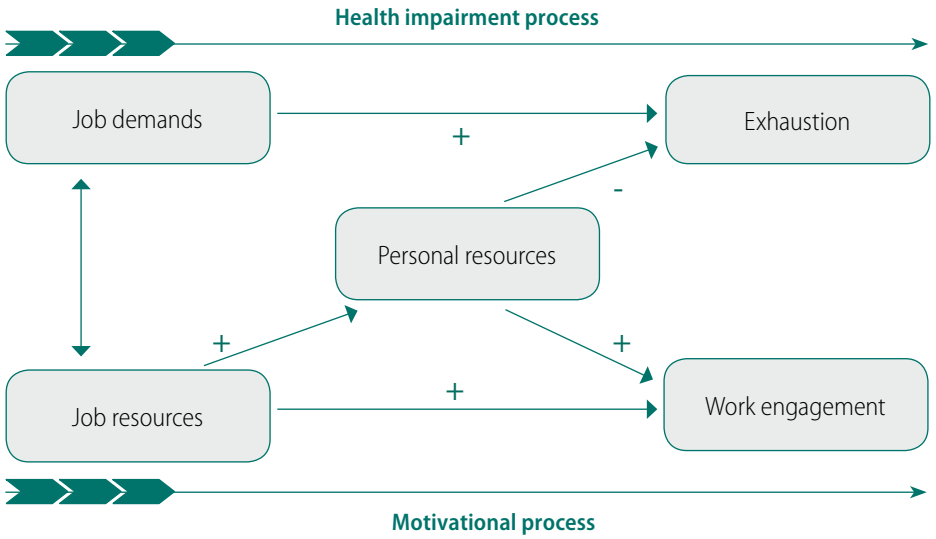
(i.e. employees' control over their tasks and how these are executed), possibilities for professional development and rewards. According to the JD-R model, job demands can evoke an *energy depletion process,* potentially leading to breakdown when individuals fail to recover adequately (Demerouti, Bakker, De Jonge, Janssen, & Schaufeli, 2001) whereas job resources induce a *motivational process,* which can promote work engagement (Bakker & Demerouti, 2007). Job resources become more salient and fulfil their motivational potential when employees are confronted with high job demands (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Hakanen, Bakker, & Demerouti, 2005). As a typical outcome of energy depletion processes, exhaustion represents the dimension of burnout that is most strongly related to predictors and outcomes (Lee & Ashforth, 1996; Maslach & Leiter, 2008). As a reaction to exhaustion, the second dimension of the burnout construct, cynicism or depersonalization, is an attempt to put more distance between oneself and job aspects. The third dimension, perceived reduced personal accomplishment, is less strongly related to exhaustion and cynicism and therefore recent research has focussed mostly on emotional exhaustion and cynicism (Demerouti et al., 2001; Maslach & Leiter, 2008). Work engagement is defined as a positive, fulfilling work-related state of mind characterized by vigour, dedication and absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002). Burnout and work engagement are not mutually exclusive however, and can be present in one person at the same time (Schaufeli & Bakker, 2004).

Reports of greater susceptibility of females to burnout have given rise to conjecture that burnout is a female rather than a male experience (Maslach, Schaufeli, & Leiter, 2001; Maslach & Leiter, 2008), but the nature of the gender-burnout relationship remains to be clarified. Women tend to score higher on emotional exhaustion than men, who tended to score higher on depersonalization (Maslach et al., 2001). This is consistent with predictions based on gender role theory positing that women learn to express their emotions while men learn to conceal them (Eagly, 1987). A meta-analysis of gender differences in burnout, confirmed that women are more likely to experience emotional exhaustion and men scoring higher on depersonalization. The effect sizes of these differences, however, were small varying from 0.1 for emotional exhaustion to -.19 for depersonalization. Results of studies within the veterinary profession did not confirm these findings. In a study among Finnish veterinarians (Reijula et al., 2003), no significant gender differences in levels of emotional exhaustion and cynicism were found, while a study among Belgian veterinarians (Hansez et al., 2008) reported higher job engagement among female and higher levels of emotional exhaustion among male veterinarians.

Personal resources

The past decade has seen a vast amount of research on the role of personal resources in work-related well-being in general and in the JD-R model in particular (Hakanen, Perhoniemi, & Toppinen-Tanner, 2008; Karatepe & Olugbade, 2009; Mastenbroek, Jaarsma, Scherpbier, van Beukelen, & Demerouti, 2014; Salanova, Bakker, & Llorens, 2006; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009). *Personal resources* are defined as aspects of the self that are generally linked to resilience, i.e. people's sense of being in control and able to influence their environment successfully (Hobfoll, Johnson, Ennis & Jackson, 2003). This definition encompasses a feeling of being appreciated and in control as well as skills and attitudes that facilitate these feelings. Related negatively to burnout and positively to work engagement, personal resources have been found to mediate the relationship between job resources and work engagement (Mastenbroek et al., 2014; Xanthopoulou et al., 2007). In the present study personal resources such as self-efficacy, optimism and proactive behaviour were examined. Figure 1 presents the extended JD-R model (including personal resources) which we validated for the veterinary profession in another study (Mastenbroek et al., 2014). In that study we expanded the JD-R model by integrating personal resources (self-efficacy, proactive behaviour and reflective skills) and performance measures in the model, and the result showed that personal resources have a mediating and initiating role in explaining work engagement and performance in young veterinary professionals.

FIGURE 1 The extended Job Demands - Resources Model (Mastenbroek et al., 2014)



Method

Procedure

For 1760 veterinarians who had graduated in the past ten years from the Faculty of Veterinary Medicine in Utrecht, the Netherlands email addresses were obtained from the database of the Royal Netherlands Veterinary Association (RVNA). This database contains addresses of all veterinarians who have graduated in the Netherlands. These veterinarians received an on-line self-report questionnaire with an introductory letter explaining the goal of the study and ensuring anonymity of the data. Reminders were sent two and four weeks after the first invitation.

Participants

Of the 860 questionnaires that were returned, 133 were incomplete and therefore excluded from the study, resulting in a response rate of 41%. Of the participants, 73% were female, mean age was 32 years (sd = 4.4), mean number of years since graduation was 4.9 (sd = 2.8) and mean number of years of work experience 4.7 (sd = 2.8). Females worked a weekly average of 35 hours (sd=11.4) and males of 45 hours (sd=9.6). Domains of employment were veterinary practice (77%), research and education (13%), industry (6%), government (3%) and non-specified jobs (1%). With regard to the distribution of gender and work domains, the participants were representative of veterinarians graduated between 1999 and 2009. As for year of graduation, the median of the respondents was 2004 compared to 2003 for the RVNA database.

Measures

The self-report questionnaire was composed of different parts comprising a total of 117 items about work engagement, burnout, job demands and job resources and personal resources, and background information.

- *Work engagement* was measured using the short nine-item version of the Utrecht Work Engagement Scale (UWES) (Schaufeli, Bakker, & Salanova, 2006), with work engagement as a one-dimensional construct and high scores indicating strong engagement. The UWES manual contains norm scores from a database of 9,679 mostly Dutch respondents (43% females, mean age 38.2 years (range 15-81 years, sd 10.5)) (Schaufeli and Bakker, 2003). The database includes 25 studies that have been conducted between 1999 and 2003 in The Netherlands and in Flanders. The database is rather heterogeneous with professional groups, ranging from unskilled blue collar and white collar workers to executives, and from hospice staff to university hospital surgeons. Scores ≥ 4.67 are considered to be high or very high.

- *Burnout* was measured using two subscales of a Dutch translation of the Maslach Burnout Inventory-General Survey (MBI-GS): Emotional Exhaustion (5 items) and Cynicism (4 items) (Schaufeli & Dierendonck, 2000). Exhaustion and work engagement items were rated on seven point scales (0=never; 6=always). The MBI manual presents a norm table based on a random sample (N = 1111) from the Dutch working population which affords a reasonable reflection of that population despite a slight overrepresentation of employees with higher education: 56% is female, mean age is 39.5 years (sd =9.5) and mean number of years of work experience 8.5 years (sd = 8.2) (Schaufeli & Dierendonck, 2000). Scores on Emotional Exhaustion ≥ 2.20 and scores of Cynicism ≥ 2.00 were considered to be high. Individuals in a non-clinical population may be considered as burnt out when they report high emotional exhaustion combined with high depersonalisation or diminished personal accomplishment (exhaustion + 1 rule) (Brenninkmeijer et al., 2003).

- *Job demands, job resources and personal resources* were measured using the Veterinary Demands and Resources Questionnaire (Vet-DRQ) containing 99 items in 22 sub-scales representing work-related or personal aspects which in a previous study were identified as relevant to veterinarians in different work domains: eight job demand scales (workload, physical demands, task ambiguity, job insecurity, role conflict, work-home interference, working circumstances and conflicts at work), eight job resource scales (decision latitude, decision authority, skills discretion, support from colleagues, support from superior, feedback from work, possibilities for professional development and rewards) and six personal resource scales (self-efficacy, reflective behaviour, optimism, assertiveness, thoughtfulness and proactive behaviour) (Mastenbroek et al., 2013). Responses on a five-point scale (1=never, 5=always) were used for the job demands and job resources sub-scales and the personal resources sub-scales (1= totally disagree, 5= totally agree). For the assertiveness sub-scale a six-point scale (1= totally disagree, 6= totally agree) was used.

- *Background information* consisted of demographic and occupational details: age, gender, number of years since graduation, number of years of work experience, work domain and type of employment.

Strategy of analysis

Association of burnout and work engagement with gender and number of years since graduation

The mean scores on work engagement, exhaustion and cynicism were compared with the UWES and MBI norm scores using t-tests for independent samples. Effect sizes were calculated using Cohen's *d (*0.2=small; 0.5=medium; 0.8=large) (Hojat & Xu, 2004). Stepwise multiple regression analysis was conducted to estimate the variation of the dependent variables (work engagement, exhaustion and cynicism). For ease of interpretation a centred version of the variable ''years since graduation' (YSG = number of years since graduation – mean (years since graduation)) was used. To test for a gender-related effect on the slope for YSG, the interaction term Gender×YSG was included as the third independent variable. SPSS version 17.0 (SPSS Inc.) was used for the analyses. To interpret the magnitude of standard regression coefficients (β), the effect size indication for correlations was used (Cohen, 1992) with 0.1, 0.3 and 0.5 representing small, moderate and large effect sizes, respectively.

Which job demands, job resources and personal resources explain variation in burnout and work engagement?

Traditionally, the relative importance of predictors has been assessed by examining regression coefficients and squared semi-partial correlations, but these measures are context dependent, and, especially in the presence of multi-colinearity (Johnson, 2000), do not unambiguously determine the contribution of the predictor to the explained variance (Budescu, 1993). To overcome this problem FIRE was used, a general heuristic procedure for variable selection in multiple linear regression analysis in which the relative importance of predictors is assessed by computing Johnson's Relative Weights (Lorenzo-Seva, Ferrando, & Chico, 2010). The program also takes account of effects of measurement error. For the analysis, SPSS and the MATRIX command language were used. The relative importance of job demand variables, job resource variables and personal resource variables in explaining variation in exhaustion, cynicism and work engagement was assessed using FIRE to calculate the relative importance of the aspects. Because of the particular interest in the drivers of psychological well-being during the transition from student to professional, the relative importance was calculated for male and female veterinarians graduated within the past five years. To test for significance of gender-differences in relative importance of subscales in explaining variation in exhaustion, cynicism and work engagement, the interaction terms (gender * subscale) were included as third term in a regression analysis.

Results

Exhaustion, cynicism and work engagement

Veterinarians' mean scores on exhaustion, cynicism as well as work engagement were lower than the relevant norm scores (table 1), but the effect sizes suggest that these differences were negligible (Hojat & Xu, 2004). Of the respondents, 14% appeared to suffer from burnout. Additionally, 27% of veterinarians scored above the cut-off score for emotional exhaustion; 22% of veterinarians scored above the cut-off score for cynicism; 15% of the respondents could be classified as highly engaged.

Effects of gender and number of years since graduation

In the absence of significant interactions with exhaustion, cynicism and work engagement, only the main effects of gender and YSG are shown in table 2. Significant gender effects with small effect sizes were found for exhaustion and work engagement: men rated themselves as less exhausted and more engaged than women. 'Years since graduation' showed a significant effect for exhaustion only, with higher ratings as veterinarians were closer to graduation and small effect sizes (β). The effects of gender and YSG result in 16% (females 18%) of the veterinarians meeting criteria for burnout in the first five years after graduation, while 13% is classified as highly engaged.

Associations between gender and job demands, job resources and personal resources

The means and standard deviations for job demands, job resources and personal resources show that in the first five years after graduation male veterinarians experienced lower job demands (physical demands, task ambiguity and work-home interference) and higher job resources (decision authority, decision latitude, possibilities for professional development, support from colleagues and superior and feedback from work) compared to their female colleagues (table 3). Males gave higher self-ratings on self-efficacy, proactivity, optimism and assertiveness. Effect sizes were small to medium.

Which job demands, job resources and personal resources explain variation in burnout and work engagement?

As for *job demands,* work-home interference and workload were the strongest predictors of exhaustion in both males and females. Role conflict (male and female veterinarians), job insecurity (females) and work-home interference (females) were the main predictors of cynicism. With regard to *job resources*, lack of decision latitude and opportunities for professional development contributed most to the variance in exhaustion and cynicism in females, while lack of support from superior and lack

of opportunities for professional development contributed most to exhaustion and cynicism in males. Job resources that were the strongest predictors of variance in work engagement related to professional development and skills discretion. *Personal resources* contributed less to the variance in exhaustion and cynicism than to the variance in work engagement. Personal resources with the strongest contribution to exhaustion and cynicism were self-efficacy (most important in females), optimism and assertiveness while self-efficacy and proactive behaviour made the strongest contribution to the explained variance of work engagement in female veterinarians. In male veterinarians proactive behaviour showed the highest contribution to work engagement.

TABLE 1 Mean scores on seven-point scale and standard deviation (between brackets) for exhaustion, cynicism and work engagement for veterinarians and the norm group, with effect sizes

VARIABLE (RATING SCALE)	ALL VETERINARIANS (N = 726)	NORM GROUP [1](N= 1.111) [2](N=9.679)	EFFECT SIZE
Exhaustion (0-6)	1.66** (1.14)	1.78 [1] (1.21)	0.1
Cynicism (0-6)	1.18*** (1.10)	1.34 [1] (1.13)	0.1
Work engagement (0-6)	3.63** (1.05)	3.74 [2] (1.17)	0.1

*** p < .01; ***p < .001; [1] (Schaufeli & Dierendonck, 2000); [2](Schaufeli & Bakker, 2003)*

TABLE 2 Results of multiple linear regression analyses with independent variables gender and years since graduation explaining dependent variables exhaustion, cynicism and work engagement, resp. for veterinarians within 0-10 years after graduation

INDEPENDENT VARIABLES	DEPENDENT VARIABLES					
	EXHAUSTION		**CYNICISM**		**WORK ENGAGEMENT**	
	B	beta	B	beta	B	beta
Constant	1.72		1.2		3.56	
Gender	-.24*	-.09	-	-	.23**	.10
Years since graduation (centered)	-.05**	-.12	-	-	-	-

*B = regression coefficient; beta = standardized regression coefficient; *p<.05; ** p<.01*

Constant= the outcome for a female at the mean number of years since graduation

TABLE 3 Mean and standard deviation (between brackets) for female and male, and effect size (ES) for the between-gender difference of aspects of job demands, job resources and personal resources for veterinarians within 0-5 years of graduation

	FEMALE	MALE	ES
N	**337**	**93**	
JOB DEMANDS			
Role conflicts	1.76 (.54)	1.74(.51)	
Workload	2.87 (.61)	2.91(.60)	
Physical demands	1.93 (.56)	1.75 (.58)	0.3**
Task ambiguity	2.53 (.78)	2.31 (.69)	0.3*
Work Home interference	2.49 (.79)	2.28(.78)	0.3*
Working circumstances	1.86 (.60)	1.83 (.58)	
Job insecurity	2.09 (1.02)	1.90 (.94)	
Conflicts at work	1.71 (.62)	1.67 (.51)	
JOB RESOURCES			
Decision authority	2.62 (.94)	3.02 (.88)	0.4***
Decision latitude	2.72 (.88)	3.04 (.71)	0.4**
Skills discretion	3.36 (.71)	3.48 (.75)	
Professional development	3.59 (.87)	3.79 (.77)	0.2*
Support colleagues	3.88 (.81)	4.18 (.67)	0.4**
Support superior	3.54 (1.03)	3.90 (.95)	0.4**
Feedback from work	2.76 (.73)	2.99 (.76)	0.3**
Rewards	3.24 (.70)	3.23 (.76)	
PERSONAL RESOURCES			
Self-efficacy	3.57 (.57)	3.84 (.43)	0.5***
Reflective behaviour	3.67 (.58)	3.68 (.53)	
Proactive behaviour	3.24 (.47)	3.41 (.51)	0.4**
Optimism	3.63 (.60)	3.93 (.46)	0.5***
Assertiveness	3.72 (.76)	4.12 (.78)	0.5***
Thoughtfulness	4.05 (.55)	3.99 (.65)	

p < .05;p < .01; ***p < .001; ES only presented for significant differences*

TABLE 4 Relative contributions (%) of job demands, job resources and personal resources to explained variance (R^2) in exhaustion, cynicism and work engagement in female (N = 337) and male (N = 93) veterinarians within five years of graduation

	EXHAUSTION		CYNICISM		WORK ENGAGEMENT	
	Female	**Male**	**Female**	**Male**	**Female**	**Male**
JOB DEMANDS						
Role conflict	13.5	7	20	38		
Workload	16.0	19	7	13		
Physical demands	6.5	15	3	4		
Task ambiguity	5.5	15	11	15		
Work-home interference	37.0	32	17	10		
Working circumstances	7.0	4	13	7		
Job insecurity	8.0	6	18	6		
Conflicts at work	6.5	2	12	8		
R^2	.49	.52	.40	.49		
JOB RESOURCES						
Decision authority	11	4	6	5	8	13
Decision latitude	44	16	13	5	16	5
Skills discretion	4	3	15	15	30	32
Professional development	11	23	29	34	21	31
Support from colleagues	5	10	10	5	3	2
Support from superior	8*	31	11	21	8	6
Feedback from work	6	2	9	3	10	10
Rewards	11	11	7	12	4	1
R^2	.33	.38	.33	.56	.48	.44
PERSONAL RESOURCES						
Self-efficacy	42.0	8	43*	8.5	29.0	15
Reflective behaviour	1.0	2	1	40.5	0.5	4
Proactive behaviour	11.5	5	12	3.0	42.5	65
Optimism	23.5	50	33	17.0	19.0	6
Assertiveness	22.0	34	10	30.0	8.0	6
Thoughtfulness	0.0	1	1	1.0	1.0	4
R^2	.19	.21	.19	.10	.31	.42

** significant gender differences in relative contribution to the outcome variable p < .05*

Discussion

The first aim of this study was to ascertain the level of burnout and work engagement in veterinarians graduating within the past decade. Additionally, we aimed to investigate any differences related to gender and years since graduation. The results show that the veterinary graduates were less exhausted, less cynical but also less engaged compared to the norm group. Although these differences were significant, the effect sizes were small. This is not in line with the expectation that young veterinary professionals are more at risk for burnout. However, the present study revealed also that prevalence of burnout among veterinary professionals is 14% within the first 10 years after graduation, and 18% within the female respondents in their first five years after graduation. To compare, Statistics Netherlands (*http://statline.cbs.nl/StatWeb/publication*) reports that in 2008-2011 13 % of the Dutch labour force is suffering from burnout. A closer inspection reveals that Statistics Netherlands assesses only one of the domains of burnout namely emotional exhaustion, which is not recommended (Brenninkmeijer et al., 2003). Applying these criteria to the respondents of this study, would imply that 27% meets criteria for burnout. In general it is very difficult to compare mean scores on, and prevalence of burnout to findings of other studies among veterinarians, because of the differences in the (versions of) instruments that were used to assess mental health and in the interpretation of the results (cut-off scores) (Platt et al., 2012). Agreement in the choice of measurement instruments and interpretation of the results in future studies on burnout and work engagement would enhance opportunities for comparative national and international research.

The results revealed a small but significant effect of gender on exhaustion and work engagement and a significant but small effect of number of years since graduation on exhaustion. Studies among Finnish (Reijula et al., 2003), and Belgian veterinarians (Hansez et al.,2008), found no, respectively opposite effects of gender on exhaustion and work engagement. In a review of gender differences in burnout scores of different occupational groups (Purvanova & Muros, 2010), a crucial gender difference was established: women tended towards emotional exhaustion, men towards cynicism. Our results didn't confirm such a pattern. In summary, the mean levels of exhaustion, cynicism and work engagement among Dutch veterinary professionals in the first ten years after graduation, give no reason for great concern when compared to levels of exhaustion, cynicism and engagement of the Dutch working population, and gender differences appear to be small. Nevertheless we feel it is alarming that one in seven young veterinary professionals suffers from burnout within the first ten years after graduation. Problems are even worse in females in their first five years after graduation where one in five meets the criteria for burnout. This problem could be

addressed by interventions tailored to this group. To develop effective interventions it is important to first identify relevant drivers of positive and negative psychological well-being in this group.

According to the JD-R model, differences in well-being can be affected by experienced job demands, job resources and/or personal resources. The results reveal that compared to their male colleagues, female veterinarians experienced slightly stronger job demands and moderately lower job and personal resources. These results are not unique to the veterinary profession. Results of a standardized multicentre study among 34,972 subjects in various regions in Europe (De Smet et al., 2005) showed that, in Middle European groups, men perceived lower psychological job demands compared to women. While this difference was small, gender differences were larger for job control, which men perceived to be higher. Gender differences in perceived job demands and resources may be attributable to objective (absolute) and subjective (perceived) access to job resources (Edwards, Caplan, & Harrison, 1998). In order to gain more insight into the objectivity of gender differences in perceived job demands and resources, studies should investigate both subjective and objective data (Smith, 2002). It is probably an oversimplification to assume that gender is the sole explanatory variable for gender-related differences in well-being or perceived job demands and resources. Situational factors, such as work-home interference, professional status (i.e. partner in a practice or assistant veterinarian) or work hours may play a role as well.

The second aim of the study was to identify job and personal characteristics predicting burnout and work engagement in male and female veterinarians in the first five years after graduation (the transition period). The results suggest that variance in *exhaustion and cynicism* is best explained by job demands and job resources and to a lesser extent by personal resources. Variance in *work engagement* may be best explained by job and personal resources. Although there is no direct relationship between job resources and exhaustion in the extended JD-R model, previous research showed that although burnout is mainly predicted by job demands, it is also negatively related to job resources (Schaufeli & Bakker, 2004). Overall, work-home interference and workload were job demands most strongly and positively related to *exhaustion*. Decision latitude in female and superior support and possibilities for professional development in male veterinarians were job resources most strongly and negatively related to exhaustion. In the first five years after graduation most veterinarians work as a salaried employee. The results suggest that in this situation decision latitude, superior support and providing opportunities for professional development and continuous learning are key resources in preventing exhaustion. More decision latitude for example, can be achieved by flexible working hours and

appropriate control over the organization of work and the fulfilment of tasks. It can help the young vet to better cope with high workload and an altered work life balance in which it sometimes can be difficult to combine working with family life.

Cynicism was best predicted by the experience of role conflicts, job insecurity and work-home interference in females and role conflicts in males even though these gender differences were not significant. Possibilities for professional development and superior support seemed to be key factors in preventing cynicism. This may be explained by the fact that the transition period is not just fraught with stress due to uncertainties but also a source of personal and professional growth provided certain job resources are present.

With regard to *personal resources*, female veterinarians rated themselves as less self-efficacious, less optimistic, less proactive and less assertive. In the extended JD-R model, personal resources have a direct and positive relation to work engagement (Mastenbroek et al., 2014). Now the job and personal resources that were most influential in relation to *work engagement* will be discussed. In predicting work engagement, skills discretion and possibilities for professional development were the most influential job resources, and proactive behaviour was the most important personal resource. Relations between job and personal resources and work engagement are reciprocal (Xanthopoulou et al., 2009): proactive people are more engaged and contribute actively to changes in the work environment if needed (Bakker, 2011). In female veterinarians self-efficacy was another important personal resource predicting work engagement. Lack of self-efficacy diminishes people's efforts to actively change their work environment, while belief in self-efficacy positively influences achievement and motivation. Although personal resources contributed only marginally to the variance in *exhaustion and cynicism,* it seems worthwhile to study gender in relation to self-efficacy. Female veterinarians perceived themselves as less efficacious than did male veterinarians, and self-efficacy was the most influential personal resource in preventing exhaustion and cynicism in female but not in male veterinarians. Self-efficacy is critical because it affects people's ability and willingness to exercise control (Schaubroeck & Merrit, 1997). More research is needed to clarify gender differences in self-efficacy beliefs among veterinary graduates.

Strengths

One of the strengths of this study is the use of a questionnaire that was tailored to the veterinary profession. Because all professions are likely to have unique risk factors for burnout, using a tailor-made questionnaire was expected to increase the probability of including only the most important and job-specific demands and resources in the

questionnaire. Another strength is the use of the validated JD-R model as a work-psychological perspective on work-related well-being. The JD-R model includes both health-related and motivational work aspects, defines relationships between predictors and outcome variables and facilitates the development and evaluation of evidence-based interventions. A further strength is that this study is among the few in this occupational field to consider personal resources as predictors of work-related well-being. A further strength is the high response rate of 41 % which is relatively high considering the length of the questionnaire. Apparently the population under research acknowledges the importance of an in-depth investigation of their work-related well-being and its predictors. A strength is also that the distribution of the sample matches the broader population of veterinarians who graduated between 1999-2009.

Limitations

Due to the cross-sectional study design with only one assessment, common method bias may have influenced the results preventing firm conclusions about causality. Such conclusions would require a longitudinal study. The results of a study of reciprocal relationships between job characteristics and work-related psychological well-being support the hypothesis that job characteristics are the dominant cause of psychological well-being (de Jonge et al., 2001), but there was also weak evidence for reversed cross-lagged effects since emotional exhaustion seemed to be the causally dominant factor with respect to (perceived) job characteristics. A similar mutual relationship was found between resources and work engagement (Xanthopoulou et al., 2009). It could be considered to be a limitation of this study, that we did not investigate, and therefore do not know, how the non-response influenced the prevalence of burnout and engagement. It has been reported that individuals with burnout who work in an organization are less likely to return questionnaires because of negative attitudes towards the organization (Taris & Schreurs, 2007). We cannot exclude the possibility that the prevalence of burnout in this study may be an underestimation. Another limitation is that the comparison norm population of the UWES and the MBI differ from the population under study with regard to age, gender, socioeconomic status, level of education. Results have to be interpreted with caution.

Practical recommendations

As most veterinary professionals will work as employee in the first five years after graduation, most recommendations are specifically directed to employers and practice-managers, which organize work, divide tasks and have access to resources. They can interpret the results as additional evidence for their potential vital role in facilitating new graduates in transitioning to competent members of the veterinary profession.

The work-related well-being of young veterinarians can be enhanced by reducing specific job demands (e.g. reducing workload by tailoring working speed and working volume, and by ensuring adequate recovery time after services; reducing role conflicts by a clear job description and acknowledgement of the professional autonomy concerning how to carry out work) and helping them manage work and home demands. Work-home interference appears to be an obvious target for intervention for example by promoting control over one's tasks through collaborative decision-making (e.g. on working hours, duty schedules and on distribution of tasks) or providing support by simply acknowledging employee's private life. Efforts could also be directed at fine-tuning the degree of support for veterinarians during the transition period (e.g. providing positive feedback on good performance, providing support after making a professional mistake transforming it into a learning experience, support in dealing with difficult clients and acknowledgement of the ups and downs of transitioning to a competent member of the profession) and a dialogue about future expectations, especially with regard to mutual aspirations for professional development, trying to match tasks to strengths. These resources may on one hand counteract the impact of demanding working conditions and help employees to avoid excessive strain, but on the other hand they may enhance employees' work engagement and performance. Differing needs of male and female veterinarians concerning the working environment should be taken into account in devising interventions to guide recent graduates in settling in their first job. However, employees are not passive performers of their assigned job tasks. They may initiate changes in the level of job demands and job resources, which is called job crafting (Tims & Bakker, 2010). Job crafting may be facilitated by job and individual characteristics. In order to improve awareness of one's needs and talents, and the skills which are necessary to improve the 'person to job fit', development programmes for young veterinary professionals as well as for veterinary managers and supervisors have recently been introduced in the Netherlands. An important lesson that veterinary educational institutions might draw from the results is that graduates' personal resources play an important role in work engagement and therefore in performance (Bakker, Demerouti, & Verbeke, 2004; Mastenbroek et al., 2014). A key issue for the veterinary curriculum appears to be the development of students' personal resources, especially proactive behaviour and self-efficacy. Female students may stand to gain even more from improvement of work-related well-being in the transition period. A better understanding of the antecedents of self-efficacy beliefs of female students in a male dominated learning environment and occupational field can only be obtained through further research.

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CHAPTER 4

The role of personal resources in explaining well-being and performance

A study among young veterinary professionals

Authors
N.J.J.M. Mastenbroek; A.D.C. Jaarsma; A.J.J.A. Scherpbier; P. van Beukelen; E. Demerouti

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Abstract

This study examines the role of three personal resources (i.e., proactive behaviour, reflective behaviour and self-efficacy) in the Job Demands-Resources (JD-R) model in order to predict self and other ratings of performance. The sample consisted of 860 Dutch veterinary professionals and 170 colleagues. We hypothesized and found that work engagement (partially) mediates the relationship between job as well as personal resources and extra-role performance and that personal resources partially mediate the relationship between job resources and work engagement. Although hypothesized, we found no support for the mediating role of exhaustion in the relationship between job demands as well as personal resources and in-role performance. Moreover personal resources were directly related to in- and extra-role performance. In conclusion, the study expands the JD-R model by integrating personal resources at a behavioural level and performance measures in the model, and shows that personal resources have a mediating and initiating role in explaining work engagement and performance in young veterinary professionals.

Introduction

During the past three decades many studies have shown that unfavorable job characteristics may have a profound impact on job stress and burnout (for review, see Lee & Ashfort, 1996). Burnout proved to be related to health complaints, job dissatisfaction, personnel turnover and absenteeism. Moreover, in the last decade the emphasis in research moved from the negative aspects and consequences of work (work stress and burnout) to the positive aspects and consequences of work (vitality and engagement) (Luthans & Youssef, 2007; Salanova, Bakker, & Llorens, 2006; Seligman & Csikszentmihalyi, 2000). The role of personal resources in this process has gained far less attention although they have been found to be beneficial for organizational outcomes (Xanthopoulou, Bakker, Demerouti and Schaufeli, 2009).

The present study will focus on the role that personal resources play in the process that affects work-related well-being and performance. We shall use the job demands-resources (JD-R) model as a theoretical framework (Bakker & Demerouti, 2007; Demerouti, Nachreiner, Bakker, & Schaufeli, 2001).
Besides its focus on an occupational group that is under-researched, the study contributes to the literature on the role of personal resources in work-related well-being and performance in several respects. Firstly, we examine the role of personal resources as predictor of in- and extra-role performance through their relationship with respectively exhaustion and work engagement. Secondly, while most research on this topic uses exclusively self-ratings of performance as outcome assessment (Taris, 2006), the present study examines how work- and personal characteristics are related to self- and other-ratings of in-role and extra-role performance. The third contribution this study makes to the literature is that, where most research investigates personal resources at an affective- or cognitive level (self-efficacy, organisational based self-esteem, optimism), we add two resources at a behavioural level (proactive behaviour and reflective behaviour). All three resources are important for health care professionals and for this age-group in particular, and can be developed by training or coaching. Before addressing the specific hypotheses of this study, we will zoom in the theoretical framework of this study, the JD-R model.

The Job Demands-Resources model

The central assumption of the JD-R model is that work characteristics can be modelled in two broad categories namely job demands and job resources. *Job demands* require sustained physical or mental effort, and are therefore associated with certain physiological and psychological costs. *Job resources* facilitate achievement of work goals, reduce demands and/or stimulate personal growth and development (Bakker,

Demerouti, & Euwema, 2005). These job demands and job resources evoke *two relatively independent psychological processes* that determine employee well-being: the health impairment process and the motivational process. Job demands draw on people's resources. High job demands may in the end exhaust employees' mental and physical resources and may lead to energy depletion eventually resulting in a breakdown when individuals fail to recover adequately (Demerouti et al., 2001; Meijman & Mulder, 1998). Exhaustion has been studied as a typical outcome of *the health impairment process* (Demerouti et al., 2001). Moreover, it represents the dimension of burnout that is most strongly related to predictors and outcomes (Lee & Ashforth, 1996 ; Maslach & Leiter, 2008) . The second dimension of the burnout construct, cynicism, is an attempt to put more distance between oneself and various job aspects, and can be seen as a reaction to exhaustion (Maslach & Leiter, 2008; Leiter, 1993), while the third dimension, reduced personal accomplishment, is less strongly related to exhaustion and cynicism. We focus therefore, in this study, on exhaustion as an indicator of health impairment. The availability of job resources leads to organizational commitment and work engagement by fostering goal accomplishment (Schaufeli & Bakker, 2004) or by satisfying basic needs. Work engagement is an outcome of this *motivational process* (Bakker & Demerouti, 2007). Work engagement is defined as a positive, fulfilling, work-related state of mind, that is characterized by vigor, dedication, and absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002). There is support for the principal pathways proposed by the model and several studies showed that the model can also predict important organizational outcomes (Bakker, Demerouti, & Verbeke, 2004; Hakanen, Bakker, & Schaufeli, 2006; Schaufeli & Bakker, 2004). We will now have a closer look to the relationship between the concepts of the JD-R model and performance.

Job demands, job resources, and their relationship with well-being and performance

In the present study we take performance ratings as outcome measure. People engage in two sorts of performances: in-role performance and extra-role performance. In-role performance is defined as the objectives and behaviour that are prescribed by the job, and that directly serve the goals of the organization (Motowidlo & Van Scotter, 1994). Extra-role performance is defined as the altruistic behaviour an employee displays, that he is not obliged to. The latter is behaviour he displays in his desire to serve the organization or to help his colleagues (Morrison, 1994).

Job demands can be seen as energetic costs and when recovery from workload-demands fails, this may lead to the depletion of energy, resulting in exhaustion. Assuming that performance always implies some (goal-directed) activity and therefore

involves the utilization of cognitive, physical and energetic resources (Roe, 1999), these resources can be the limiting factor. When people get tired under the influence of high demands, extra energy has to be mobilized to maintain task performance (Hockey, 1997). This may result in feelings of acute fatigue. When recovery fails, chronic effects on health and well-being may result and people *can no longer perform*. Although performance protection strategies make it difficult to demonstrate an obvious diminishing of primary task performance (Hockey, 1993), exhaustion can be a mediator in the relationship between job demands and in-role performance (Bakker et al., 2004).

Job resources such as autonomy, social support, performance feedback, skills discretion and possibilities for professional development are consistently and positively associated with work engagement (Bakker & Demerouti, 2007).
Job resources are instrumental in achieving work goals, can foster personal growth and/or satisfy basic human needs (e.g., need for autonomy) and through this they increase employees' willingness to dedicate their efforts and abilities to the work task and to the organization. When organizations do not provide employees with job resources, the long term consequence is withdrawal from work and reduced motivation and commitment (Bakker, Demerouti, de Boer, & Schaufeli, 2003), *there is no longer a will to perform*. While extra-role performance (the behaviour an employee is not obliged to display) depends for a great deal on employees' motivation, in-role performance depends more on employees' abilities and experience. Therefore we expect work engagement to be a mediator in the relationship between job resources and extra-role performance. Bakker et al. (2004) found support for this hypothesis.

Demerouti and Bakker (2006) give an extensive overview of theories that explicitly use well-being in predicting performance, and the empirical evidence regarding the relationship between indicators of work-related well-being and job performance. They conclude that negative indicators of well-being as well as health (problems) do not show as strong relationships with performance as one would expect (9% of shared variance). People seem to use compensation strategies, or try to focus on the most important tasks in order to save energy. Especially more experienced employees do not necessarily perform worse when they experience symptoms of exhaustion. On the contrary, positive indicators of well-being, like work engagement, seem to be more strongly related to performance than negative ones (Demerouti & Bakker, 2006). In a meta-analysis in which they examined the relationship between stressors, strain, motivation and job performance LePine, Podsakoff and LePine (2005) found that motivation and strains at least partially explained the relationship between stressors and performance.

Based on the existing literature and the previous theoretical analysis we hypothesize:

Hypothesis 1: Exhaustion mediates the relationship between job demands and in-role performance.

Hypothesis 2: Work engagement mediates the relationship between job resources and extra-role performance.

Personal resources and their relationship with well-being and performance

Only a few studies have incorporated both personal resources and work characteristics in a single theoretical model (Mauno, Kinnunen, & Ruokolainen, 2007). *Personal resources* can be defined as aspects of the self that are generally linked to resiliency and refer to people's sense of having control over, and being able to successfully influence their environment (Hobfoll, Johnson, Ennis, & Jackson, 2003). Personal resources have been measured as *traits and states*. Most studies take a state-perspective. Both, states (e.g. self-esteem, optimism, hope) and traits (e.g. extraversion, emotional stability), may influence the perception and interpretation of a situation and how a person will react to it. State-like personal resources have also been identified as predictors of work engagement (Hakanen et al., 2006; Hakanen, Perhoniemi, & ToppinenTanner, 2008; Halbesleben, Harvey, & Bolino, 2009; Karatepe & Olugbade, 2009; Salanova, Llorens, Cifre, Martínez, & Schaufeli, 2003; Xanthopoulou, Bakker, Heuven, Demerouti, & Schaufeli, 2008) and burnout (Kalimo, Pahkin, Mutanen, & Toppinen-Tanner, 2003; Leiter, 1993; Schwarzer & Hallum, 2008)

The present study focuses on three personal resources: reflective behaviour, pro-active behaviour and self-efficacy. Where self-efficacy is a state and acts at a cognitive level, proactive and reflective behaviour are resources which are related to observable behaviour. As far as we know personal resources at a behavioural level have not been integrated in the JD-R model before. These three resources were selected because **(a)** they are important for health care professionals and for this age-group in particular (Bok et al., 2011), **(b)** they are open to development, **(c)** they have been identified as correlates of psychological well-being and performance in other settings.

Regarding reflective behaviour, it is suggested that it can help to make sense of complex patient cases and it reduces uncertainty (Schön, 1983 p. 61-64). Reflection is part of the decision making process. These decision making processes may be analytical or intuitive. Analytical processing occurs when people reflect upon a situation, search for feedback and information and analyze other options, or specify an effective treatment. Intuitive processing is based on cues from past experiences. While young veterinarians lack experience, their decision making processes tend to have an analytical nature. Analytical decision making is slow and takes effort. Reflective

skills facilitate this decision making process, and will therefore have a beneficial effect on exhaustion. Analytical decision making is positively related to in-role performance (Gordon, Demerouti & Bipp, 2011). We therefore expect that reflective behaviour is negatively related to exhaustion and positively related to work engagement.

There is considerable evidence regarding the positive effect of self-efficacy and proactive behaviour on psychological well-being and performance (Bandura, 1999, 2001; Bateman & Crant, 1999; Crant, 1995; Dikkers, Jansen, de Lange, Vinkenburg, & Kooij, 2010; Frese & Fay, 2001). *Proactive people* scan for opportunities, show initiative, take action, and persevere until they have achieved what they intend, bringing about change (Bateman & Crant, 1993). In a cross-sectional study among 1910 police officers, Storm and Rothmann (2003) found that engaged officers had an active coping style, being problem focused, taking initiatives to deal with demands and stressors. We therefore expect people who behave proactive to be better performers through higher work engagement and lower exhaustion. Perceived self-efficacy is defined as people's beliefs regarding their capabilities to produce designated levels of performance and exercising influence over events affecting their (working) lives (Bandura, 1997). Efficacy beliefs determine how much effort people will expend, and how long they will persist in the face of obstacles and adverse experiences. The stronger the efficacy expectations, the more active the efforts (Bandura, 1977, p. 80). In work settings, significant correlations have been found between self-efficacy, work engagement and work performance (Stajkovic & Luthans, 1998; Xanthopoulou et al., 2008). Together these three personal resources foster learning, reduce uncertainty, increase self-confidence, and stimulate a more active approach to confronting difficulties and therefore we think that they will have a direct positive effect on exhaustion and work engagement and through these on performance. Therefore we hypothesize the following:

Hypothesis 3: Exhaustion mediates the relationship between personal resources and in- role performance.

Hypothesis 4: Work engagement mediates the relationship between personal resources and extra-role performance.

The benefits of personal resources depend also on the availability of certain specific job resources which enables and stimulates the person to deploy his/her personal resources. Conform Hobfoll's COR theory (Hobfoll, 2002) people strive to retain, protect, and build resources, and the existence of resources tends to generate other resources (e.g. personal resources), which may lead to positive psychological (well-being) and organizational outcomes (e.g., responsibility and control over how to perform tasks, will trigger employees to take more initiatives and to behave proactive).

Drawing on the results of previous research we hypothesize the following:

Hypothesis 5: Personal resources partially mediate the relationship between job resources and work engagement.

The model is graphically depicted in Figure 1. The numbers correspond with the numbers of the hypotheses.

The context of the present study

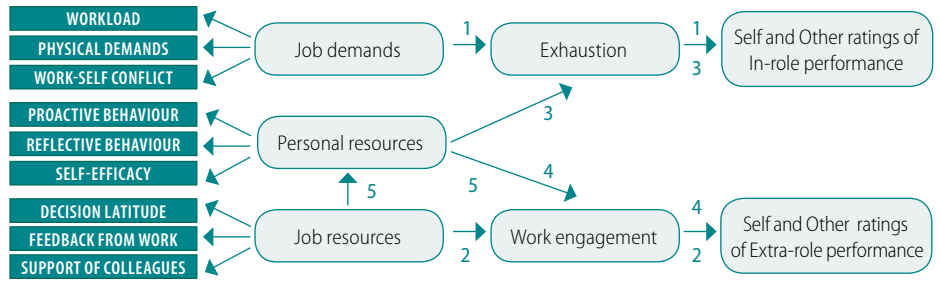
The study was conducted among veterinary professionals in the Netherlands. Two important developments form the context for this study. First, the transition problems reported by recently graduated veterinarians in the Netherlands (Jaarsma, Dolmans, Scherpbier, & Van Beukelen, 2008). For many veterinary professionals, the first years after graduation form a period in which they are searching for a balance between learning the job, working and private life, and these years could easily be experienced as stressful. Previous research in New Zealand, the UK and Finland has shown that young veterinary professionals experience higher levels of stress than older ones (Bartram, Yadegarfar, & Baldwin, 2009; Gardner & Hini, 2006; Reijula et al., 2003). Second, the developments in the field (like a more aggressive, commercially driven competitive environment, the emergence of large inter-professional partnerships, an exponentially growing body of biomedical knowledge and consequently increased public expectations of the profession) require other competencies from the veterinary professional today (May, 2008). In the context of these developments employers and veterinary faculties are very interested in the role of personal resources, that can help young professionals to deal with those new demands, and which can help them remain engaged. This makes this occupational group especially suitable for an investigation of the expanded JD-R model suggested in this study.

Method

Procedure and Participants

In order to find out which were the most important job demands and job and personal resources, interviews were conducted with 13 representatives of the professional field graduated between 1999 and 2009. The interviews included questions about the positive and negative aspects of the work, which help or hinder a veterinarian in the course of his employment. The result was a list of most important job demands and job resources for this professional group. From this list we made a selection of job demands and job resources that have been identified as major stressors respectively motivators for the majority of occupations and for veterinarians in this

FIGURE 1 The Job Demands - Resources model expanded with personal resources, and applied to in-role and extra-role performance. The numbers represent the respective hypotheses



age-group specifically: workload, physical demands and work-self conflict (Bakker & Demerouti, 2007; Lee & Ashfort, 1996; Haverkamp, 2006), decision latitude, support from colleagues and feedback from work ((Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004; Schaufeli, Bakker & van Rhenen, 2008). The personal resources were chosen because of their important role in the current veterinary curriculum in the Netherlands (Bok et al., 2011).

The participants in this study were all veterinarians who graduated on the Faculty of Veterinary Education of a Dutch university between 1999 and 2009. Data collection took place by online survey. In the accompanying letter the confidentiality of the data was emphasized. The 860 respondents represented a response rate of 49 %. The sample included females (73%) and males (27%), which corresponds to the gender composition of the sample under study. The mean age was 32 years (*sd* =4.4). Their mean work-experience in years was 4.7 (*sd* = 2.78, median 4). They were employed in the following sectors: veterinary practice (77%), University of Veterinary Medicine (10 %), business (6 %), (agricultural) education (2 %), and other research institutes (1 %). At the end of the questionnaire participants were asked to fill in the name of a colleague or supervisor that we could send a separate questionnaire in order to complete an other-rated assessment of the performance of the participant. Respondents were asked to suggest a colleague (or supervisor) that they worked together and in the same organization. The dyads were later matched. Two and four weeks after the distribution of the questionnaire and the colleague-questionnaire, reminders were sent by personalized email. A total of 235 respondents filled in the name of a colleague or a supervisor to whom we could send the questionnaire for other-ratings. Seventy -two percent (93 colleagues and 77 supervisors) responded the questionnaire.

Measurement Instruments

Job demands

Three job demands potentially related to burnout were included in the questionnaire: workload, physical demands and work-self conflict. Workload and physical demands were both based on a scale developed by van Veldhoven and Meijman (1994). Workload included six items. An example item is: "Do you have to work very fast?" Physical demands included five items including "Are you bothered, during your work, by frequently lifting or lugging?" Work-self conflict was based on a scale developed by Demerouti (2012) and included four items, such as "How often does it happen that your work schedule makes it difficult for you to fulfil your personal interests?" Responses on all three scales could be made on a five-point scale (1= never, 5= always).

Job resources

Three job resources were included in the questionnaire: decision latitude, support from colleagues and feedback from work. All three job resources were measured by scales developed by van Veldhoven and Meijman (1994). Decision latitude included six items. An example item is "Can you decide yourself how to execute your work?" Support of colleagues was measured with six items. An example item is "Can you ask your colleagues for help if necessary?" Feedback from work was measured with five items including "Do you get enough information about the results of your work?" Responses on all three scales could be made on a five-point scale (1= never, 5= always).

Personal resources

Three personal resources were included in the questionnaire: self-efficacy, proactive behaviour and reflective behaviour. All responses on personal resources were scored on a five point scale, ranging from (1) "totally disagree" to (5) "totally agree". Self-efficacy was assessed with a four-item scale from Bakker (2008). An example item is: "When I am confronted with a problem, I have more then one solution most of the time". Proactive behaviour is measured with a seven-item scale derived from "the Proactive Personality Scale" from Bateman and Crant (1993). For example: "I am great at turning problems into opportunities". Reflective behaviour was assessed with a seven-item scale derived from the Groningen Reflection Ability Scale (Aukes, Geertsma, Cohen-Schotanus, Zwierstra, & Slaets, 2007). An example item is *"I am able to view my own behaviour from a distance"*.

All responses were coded such that higher scores referred to higher job demands, more job resources and higher levels of personal resources, respectively.

Psychological outcomes

Exhaustion was measured with a scale of the Dutch version (Schaufeli & van Dierendonck, 2000) of the Maslach Burnout Inventory-General Survey (Schaufeli, Leiter, Maslach & Jackson, 1996). This scale includes five items, such as: "I feel emotionally drained from my work". Work Engagement was measured with the short, nine-item version of the Utrecht Work Engagement Scale (UWES) (Schaufeli, Bakker, & Salanova, 2006). The UWES items reflect three underlying dimensions, which are measured with three items each: Vigor (e.g., At my work, I feel bursting with energy"), Dedication (e.g., "My job inspires me"), and Absorption (e.g., "I get carried away when I am working"). High scores on all three dimensions indicate high work engagement. All items of the exhaustion and the work engagement subscales were scored on a seven-point scale, ranging from (0) "never" to (6) "always".

Performance

Self and other-ratings of performance are measured with six items from a scale of Goodman and Svyantek (1999). This scale consists of 25 items which load on three factors: Altruism, Conscientiousness and Task Performance. In order to control for the length of the questionnaire we used a reduced number of items. The items have been selected so that they can be answered by colleagues and supervisors, as they cannot always observe the work of their colleague. In-role performance was assessed with three items of the factor Task Performance. An example item is: "Achieves all the objectives of the job" (0 = not at all characteristic, 6 = totally characteristic). Extra-role performance was assessed with three items of the factor Altruism. An example item is: "Helps his colleagues when returning to work after a period of absence". Participants and their colleagues were asked to indicate the extent to which they found each statement characteristic of the participant's in-role and extra-role performance. The same answer categories as for in-role performance were used. Because conscientiousness is one of the factors in the Five Factor Model of Personality Traits, it would fit better in the latent variable Personal Resources. Conscientiousness as a personality factor seems to correlate to both in-role and extra-role performance (Chiaburu, Oh, Berry, Li, & Gardner, 2011). For these reasons conscientiousness was excluded from our study.

Strategy of analysis

To test our hypotheses we conducted structural equation modeling (SEM) analysis using the AMOS software package (Arbuckle, 2008). The maximum likelihood method of estimation could be used for incomplete data, since all variables were normally distributed (Carter, 2006). Full-information maximum likelihood (FIML), which is available in the AMOS software package, uses all the information of the observed

data, including information about the mean and variance of missing portions of a variable, given the observed portion(s) of other variables (Wothke, 1998; Carter, 2006). Therefore the N value differs for each variable and is listed in Table 1.

The goodness-of-fit of the investigated model was evaluated using the chi-square (χ^2) statistic and the Root Mean Square Error of Approximation (RMSEA). Non-significant χ^2 values indicate that the hypothesized model fits the data, and RMSEA values up to .08 indicate an acceptable fit to the data (MacCallum, Browne, & Sugawara, 1996). However, the χ^2 goodness-of-fit statistic is sensitive to sample size, and this increases the probability of rejecting the hypothesized model with increasing sample size. Therefore we used the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI/ NNFI), and the Normed Fit Index (NFI). These are relative goodness-of-fit indices. For each of these statistics, values of .90 or higher are acceptable (Hoyle, 1995).

The six job characteristics were modeled as two exogenous latent factors (see Figure 1), one representing job demands (three indicators) and the other representing job resources (three indicators). Personal resources were modeled as one latent factor with three indicators. This factor is treated as an endogenous (mediator) variable. In addition to these endogenous factors, the model includes the outcome factors, namely in-role and extra-role performance. The mediator factors exhaustion and work engagement were modeled as single indicator factors. In order to account for random measurement errors of the single indicator factors we set the random error variances associated with each indicator equal to the product of its variance and the quantity one minus its internal consistency, as indicated by coefficient α (Jöreskog & Sörbom, 1993). The latent outcome factors were operationalised by self- and other-ratings of in-role and extra-role performance. Additionally, the model included the following correlations: **(a)** among the latent exogenous factors job demands and job resources, **(b)** among the uniqueness' of the latent factors exhaustion and work engagement, and **(c)** among the errors of the self-ratings of in-role and extra-role performance and among the errors of the other-ratings of in-role and extra-role performance.

To test whether workload, work-self conflicts, physical demands, decision latitude, support of colleagues, feedback from work, reflection, self-efficacy and proactive behaviour could be represented as three types of latent factors, we performed confirmatory factor analyses (CFA). The fit of the 1-factor model with all 9 variables under study loading on a single latent variable was compared with that of a 2-factor that included resources (decision latitude, social support from colleagues and feedback from work, proactive behaviour, reflective behaviour and self-efficacy) and

demands (workload, physical demands and work-self conflict) and with a 3-factor model that included, next to a demands factor, also separate factors for job resources (decision latitude, social support from colleagues and feedback from work) and personal resources (proactive behaviour, reflective behaviour and self-efficacy). The three factor model had a satisfactory fit to the data (χ^2 (24) = 118; p< .001, RMSEA= .07, CFI = .91, TLI = .84, NFI = 0.90, all factor loadings were significant, range of the factor loadings: .38 / .90; N=860), and its fit was superior to that of the 1-factor model ($\Delta\chi^2$ (3) = 362; range -.53 / .56; N = 860) and the 2-factor model ($\Delta\chi^2$ (3) = 155; range of factor loadings: .27 / .96; N = 860).

The model in Figure 1 and the mediation effects were tested in three steps as recommended by Baron and Kenny (1986). The first step in establishing a mediation effect is to test whether there is a significant relationship between the predictor and the outcome variable (direct effects are tested in model M1, indirect effects are constraint to zero in M1). Second, the predictor must be significantly related to the mediator, and third, the mediator must be significantly related to the outcome (indirect effects are tested in the M2, direct effects are constraint to zero in M2). There is a mediation effect when the relationship between the predictor and the outcome becomes non-significant (full mediation) or smaller (partial mediation), after inclusion of the mediator (tested in model M3 which includes both direct and indirect effects). To test the significance of the mediation effects we applied a bootstrap approach (Preacher & Hayes, 2008), which enabled us to calculate 95% confidence intervals of the mediation effects. Bootstrapping generates *k* random samples (*k* is here 2,000) from the original distribution. As the bootstrap approach does not permit the existence of missing values, it is performed on N=170.

Results

Descriptive Statistics

Table 1 shows the means, standard deviations, correlations, and the internal consistencies (Cronbach's alpha) of the variables included in the analyses. As can be seen from this table, most scales show satisfactory Cronbach's alpha.

Model testing

Table 2 shows the fit of the various alternative models. As can be seen the fit of M3 (including both direct and indirect relationships) was significantly better than the fit of the model including only the direct paths (M1) or the model including only the indirect relationships (M2). The significant paths of M3 are displayed in Figure 2. The

	N	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. WORKLOAD	860	2.93	0.62	(.84)														
2. PHYSICAL DEMANDS	841	1.87	0.60	.201**	(.81)													
3. WORK-SELF CONFLICT	802	2.41	0..80	.463**	.364**	(..84)												
4. DECISION LATITUDE	786	2.95	0.90	-.159**	-.233**	-.289**	(.91)											
5. FEEDBACK WORK	747	2.79	0.76	-.025	-.181**	-.243**	.327**	(.85)										
6. SUPPORT COLLEAGUES	765	3.96	0.73	-.158**	-.161**	-.310**	.224**	.394**	(.87)									
7. PROACTIVE BEHAVIOUR	743	3.41	0.46	.129**	-.044	-.023	.286**	.283**	.114**	(.79)								
8. REFLECTIVE BEHAVIOUR	741	3.78	0.42	.015	-.095**	-.046	.062	.130**	.066	.276**	(.72)							
9. SELF-EFFICACY	733	3.75	0.54	.009	-.120**	-.165**	.258**	.244**	.185**	.483**	.270**	(.77)						
10. WORK ENGAGEMENT	727	3.62	1.05	-.068	-.153**	-.200**	.411**	.407**	.267**	.416**	.169**	.394**	(.94)					
11. EXHAUSTION	727	1.66	1.14	.376**	.338**	.557**	-.416**	-.279**	-.295**	-.203**	-.057	-.313**	-.179*	(.92)				
12. OR-PERF-IR	170	5.64	1.15	.094	.017	-.113	.232**	.272**	.062	.277**	.084	.129	.192**	-.179*	(.93)			
13. OR-PERF-ER	170	5.09	1.34	-.009	-.010	-.082	.204**	.239**	.072	.210**	.095	.122	.189*	-.115	.624**	(.70)		
14. SR-PERF-IR	728	3.82	1.06	.060	-.028	-.111	.235**	.284**	.154**	.437**	.229**	.432**	.388**	-.187**	.269**	.105	(.77)	
15. SR-PERF-ER	728	3.91	1.04	.018	.044	-.006	.132**	.190**	.167**	.299**	.276**	.213**	.323**	-.058	.114	.260**	.459**	(.89)

*Note: * p < .05, 2-tailed. ** p < .01, 2-tailed; SR = self-ratings; OR = other-ratings; IR = in-role; ER = extra-role*

TABLE 1 Means, Number, Standard Deviations, Internal Consistencies (Standardized Alphas-on the diagonal) and Correlations between the variables

◀ *Page 84*

TABLE 2 Results of Structural Equation Modeling: Fit Indices of the JD-R model, Standardized Maximum Likelihood Estimates (N = 860)

MODEL	X^2	*df*	*P*	RMSEA	NFI	TLI	CFI	COM-PARISON	ΔX^2	Δdf
M1. Direct effects	938	83	< .001	.11	.65	.52	.67	M3-M1	656	6
M2. Hypothesized model	487	81	< .001	.08	.82	.77	.84	M3-M2	205	4
M3. Direct and indirect effects	281	77	< .001	.06	.90	.88	.92	---	---	---

Note χ2 = chi-square; df = degrees of freedom; RMSEA = root mean square error of approximation; NFI = normed fit index; TLI = Tucker-Leeuwis index; CFI = comparative fit index

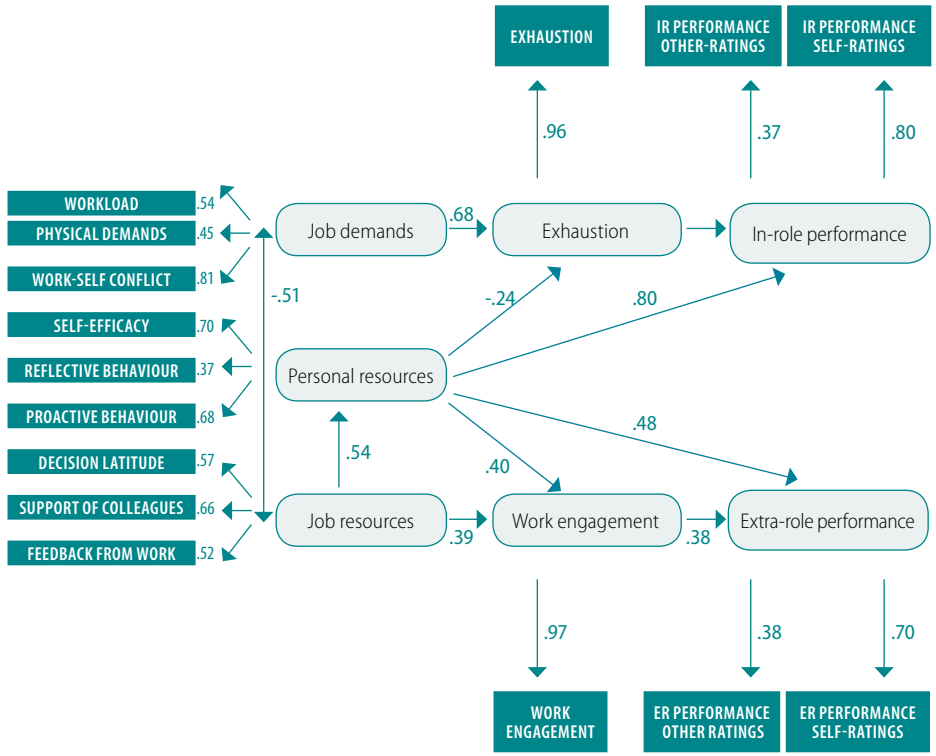
model (M3) explains 30% of the variance in personal resources, 61% of the variance in exhaustion, 49% of the variance in work engagement, 63% of the variance in in-role performance and 35% of the variance in extra-role performance.

Tests of the mediations

The significant coefficients of the path between the predictors and the outcome variables (M2) allow proceeding with the test of five Hypotheses.

Hypothesis 1 states that exhaustion (EXH) mediates the relationship between job demands (JD) and self- and other-ratings of in-role performance (PERF-IR). Model 1 showed that the direct effect of JD on PERF-IR was significant (β = -.11, $p < .05$). JD are positively related to EXH (β = .67, $p < .001$), and EXH is negatively related to PERF-IR (β = -.45, $p < .01$) in M2. After inclusion of the mediator (EXH), the relationship between JD and PERF-IR becomes non-significant. The bootstrap results showed that the indirect effect of JD on PERF-IR is non-significant in M3 (β = -.15, *ns*). Thus, Hypothesis 1 is not supported, although the indirect paths were

FIGURE 2 Significant Paths (p < .05) in definitive model (M3) (N=860)



significant in M2 as well as the bootstrap approach in M2 (β = -.23, p < .01, two-tailed confidence interval between -.47 - -.08). The path between EXH and PERF-IR is non-significant in M3.

Hypothesis 2 states that work engagement (WE) mediates the relationship between job resources (JR) and extra-role performance (PERF-ER). Model 1 showed that the direct effect of JR on PERF-ER was significant (β = .20, p < .05). As suggested in hypothesis 2, the indirect relationship from JR to PERF-ER through WE shows the following pattern in M2: JR are positively related to WE (β = .41, p < .001), and WE is positively related to PERF-ER (β = .43, p < .05). After inclusion of the mediator (WE), the relationship between JR and PERF-ER is non-significant. WE fully mediates the relationship between JR and PERF-ER. The bootstrap results showed that the indirect effect of JR on PERF-ER is significant (β = .58, p < .01; confidence interval between 0.31 – 1.008). Thus, Hypothesis 2 is supported.

Hypothesis 3 states that exhaustion (EXH) mediates the relationship between personal resources (PR) and in-role performance (PERF-IR). Model 1 showed that the direct effect f PR on PERF-IR was significant (β = .76, p < .001). PR are negatively related EXH (β = - .27, p < .001), and EXH is negatively related to PERF-IR (β = -.45, p < .01) in M2. After inclusion of the mediator (EXH), the relationship between PR and PERF-IR is still significant (β = .80, p < .001). The bootstrap results showed that the indirect effect of PR on PERF-IR is non-significant in M3. Hypothesis 3 had to be rejected although the indirect paths were significant in M2. The path between EXH and PERF-IR is non-significant in M3.

Hypothesis 4 states that work engagement (WE) mediates the relationship between personal resources (PR) and extra-role performance (PERF-ER). Model 1 showed that the direct effect of PR on PERF-ER was significant (β = .54, p < .001). The indirect relationship from PR to PERF-ER via WE shows the following pattern in M2: PR are positively related to WE (β = .38, p < .001), and WE is positively related to PERF-ER (β = .43, p < .001). The relationship between PR and PERF-ER was still significant after inclusion of the mediator (β = .48, p < .001). WE partially mediates the relationship between PR and PERF-ER. The bootstrap results showed that the indirect effect of PR on PERF-ER is significant in M3 (β = .23, p < .05; confidence interval between 0.06 – .53). Hypothesis 4 is supported.

Hypothesis 5 states that personal resources (PR) mediate the relationship between job resources (JR) and work engagement (WE). Model 1 showed that the direct effect of JR on WE was significant (β = .40, p < .001). JR are positively related to PR (β = .53, p < .001), and PR are positively related to WE (β = .38, p < .001) in M2. The relationship between JR and WE is still significant after inclusion of the mediator (β = .39, p < .001). PR partially mediates the relationship between JR and WE. The bootstrap results showed that the indirect effect of JR on WE is significant in M3 (β = .28, p < .05; 90% confidence interval between 0.14 - 0.62). Hypothesis 5 is supported.

Discussion

This study focuses on the role of personal resources in the processes that predict exhaustion and work engagement as well as performance (respectively in-role and extra-role performance) among young veterinary professionals. Until now research on the role of personal resources in work processes has been scarce.

The innovative contribution of this study on the literature is that two of three personal resources have not been studied before within the JD-R model. The practical relevance of the results will be discussed. The results of this study show that personal resources on a behavioural level may predict in- and extra-role performance, partially through increased work engagement. This is interesting because unlike resources at a cognitive/affective level, reflective- and proactive behaviour can be better rated by others. With regard to common method bias it is recommended to use different sources. While most research on the JD-R model is performed with exclusively self-ratings, in this study performance is measured through both, self- and other-ratings.

On the basis of the extended JD-R model we tested five hypotheses. We hypothesized that job demands and personal resources would be the most important predictors of in-role performance through their relation with the exhaustion component of burnout (H1 and H3). The results did not support these hypotheses. However, exhaustion mediates the relationship between job demands and in-role performance in the hypothesized model (M2). In the definitive model (M3), this could not be confirmed. In addition, we theorized that job and personal resources would be the most important predictors of extra-role performance through their relationship with work engagement. The results were supportive of both hypotheses. Work engagement fully mediates the relationship between job resources and extra-role performance, and partially mediates the relationship between personal resources and extra-role performance (supporting H2 and H4). Finally, we predicted that the relationship between job resources and work engagement would be mediated partially by personal resources (H5). The results supported this final hypothesis. We will discuss the results.

Job demands, job resources and performance

We could not confirm the mediating role of exhaustion in the relationship between job demands and in-role performance. This is in contrast with the results of Bakker et al. (2004). However, in a replication study, Bakker, van Emmerik and van Riet (2008) could not confirm the relation between exhaustion and in-role performance. How can we explain this? *First*, the results showed that the indirect effect of job demands on in-role performance was significant in the model with only the indirect effects. Through the addition of the direct effect of personal resources on in-role performance, the fit of the model increases, although the relationship between exhaustion and in-role performance disappears and the previously significant mediation-effect turns into an non-significant mediation-effect. A possible explanation can be that, through the addition of the direct effect, an indirect relationship between job resources and

in-role performance is activated. In this relationship personal resources may have a mediating role. Additional analysis, which we did to test this indirect effect, showed that indeed the indirect relationship between job resources and in-role performance was significant. Probably for this reason, the relationship between exhaustion and in-role performance turns into a non-significant relationship and the indirect effect between job demands and in-role performance turns into a non-significant indirect effect. *Second*, individuals who are more reflective, more proactive and feel self-efficacious seem to be less exhausted. The relationship between exhaustion and in-role performance however is weak. Under the influence of high job demands, individuals use a performance-protection strategy (Hockey, 1993). This can be achieved through the mobilization of sympathetic activation, increased subjective effort or both (Hockey, 1993). The greater the activation or effort, the greater the costs for the individual. But, while the individual's energy resources decrease, his/her in-role performance will remain at level, thanks to performance protection strategies. For a veterinarian is the healing of animals (primary task) an important drive and an intrinsic motivation. In case of exhaustion, he/she will probably maintain in-role performance, and compensate with lower extra-role performance, or decreased performance on other tasks, for example at home (Demerouti, Bakker, & Bulters, 2004). *Third,* the low exhaustion level among young veterinary professionals can indicate a restriction in range, and may have limited the chance to find strong relationships between exhaustion and performance.

Personal resources and the motivational process

The mediating role of 3 specific personal resources (i.e., self-efficacy, proactive behaviour, and reflective behaviour) in the relationship between job resources and work engagement was tested. Few studies have integrated these personal resources within the JD-R model before. SEM-analyses supported our hypothesis. This is in accordance with the results of Xanthopoulou et al. (2007), however the personal resources examined in this study were on a cognitive/affective level. In addition to self-efficacy, we examined the role of personal resources at a more practical and behavioural level (proactive and reflective behaviour). Our results show that a resourceful environment is associated with more reflective and proactive behaviour and with an increased feeling of self-efficacy. Employees who show more reflective and proactive behaviour, and who feel self-efficacious are more engaged. Our results show that interventions aimed at teaching skills (reflective and proactive skills) can be useful in improving work related well-being. In another (longitudinal) study Xanthopoulou et al. (2008) found that these relations are reciprocal, thereby contributing to the development of resources caravans (Hobfoll, 2002). Our study design does not allow us to make conclusions about the direction of these relationships.

Strengths and weaknesses of this study

A strength of this study was that different sources were used for the performance measures, i.e., self-assessments and other-ratings. Other-ratings were included to avoid one of the major causes of common method variance, namely: Obtaining the measures of both predictor and criterion variables from the same rater or source. Because other-ratings are still subjective measures, it would be advisable to add more objective performance measures, although this is not easy for the profession under study.

A possible weakness related to the way of collecting other-ratings of performance, is the possibility that this procedure results in some upward bias, because participants could be more likely to contact a colleague who would presumably rate their performance positively than a colleague who might rate their performance as being below par. Table 1 shows that indeed the means of other-rated in-role and extra-role performance measures indeed were higher than the means of self-rated performance measures. Additional analysis showed that these differences were significant.

Because of the cross-sectional design of this survey, we are not allowed to make causal inferences. According to Mathieu and Taylor (2006), the most valuable bases to advance such inferences come from: (1) experimental design features; (2) temporal precedence; and (3) theoretical rationales. We can not draw firm conclusions about the causality of the findings, although they were consistent with our hypotheses which were theory-based and build on former research on the JD-R model and of extensive study of the literature on this subject.

Another weakness could be that our respondents were all veterinarians in a specific age-group. This means that our sample is quite homogeneous, regarding the level of education. Future research is needed to clarify the generalizability of our findings to other veterinarians, occupations or organizations.

Practical implications

What can organizational psychologists and veterinarians learn from this study? Although our research design does not allow is to make causal attributions, we may probably conclude that it is important that young professionals can work in environments that provide them with sufficient job resources. Having access to job resources (autonomy, social support and feedback from work) is related to increased motivation and engagement, and through this with increased performance. Since people have to work together in larger groups, extra-role performance will be of greater importance in the future. A professional, who works autonomously,

receives feedback from his work, and gets support from colleagues, may increase or activate his/her personal resources. These resources will help him/her to a better performance.

Because of their intrinsic motivation, veterinary professionals will go on performing, when at the same time they have feelings of exhaustion. Development of burnout is a risk in this situation. In a resourceful work environment people reflect on situations, take initiative and feel self efficacious. They probably have a problem focussed coping style, and are more engaged and less exhausted. In jobs were 'the work must go on' it is important to empower job incumbents with specific personal resources in order to prevent development of burnout. More research, with longitudinal or experimental design, should be done on the reciprocity of the relation between job resources and personal resources, the resource caravans.

Regarding to difficulties which young veterinarians experience in the years after graduation, we could say empowerment can result, not only by improving student's personal resources, but also by teaching them how to gain access to more job resources. Future studies may include more personal resources in order to test the potential of personal resources in the JD-R model.

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CHAPTER 5

Personal resources: Can they be developed?

Evaluation of the effects of a one-year development programme for recently graduated veterinary professionals

Authors
N.J.J.M. Mastenbroek; P. van Beukelen; E. Demerouti; A.J.J.A. Scherpbier; A.D.C. Jaarsma

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Abstract

Introduction

Personal resources are defined as aspects of the self that are generally linked to resilience. They are negatively related to burnout and positively and reciprocally to work engagement and job resources. With the aim of enhancing personal resources of recently graduated veterinarians, a one-year development programme was designed.

Aim

This study was conducted to analyse:

1. if and how the development programme altered participants' personal resources, and
2. how the possible alteration of personal resources related to the participants' job resources and work engagement.

Method

A combined quantitative/qualitative approach was used. Twenty-five out of forty-six participants completed an online survey covering personal resources, job resources and work engagement before entering and immediately after finishing the programme. For statistical analysis paired T-tests were used. Sixteen interviews were taken six months after finishing the programme. The interviews were analysed using directed content-analysis.

Results

Self-reported ratings of reflective behaviour, proactive behaviour and self-efficacy were significantly increased. The interviews revealed that participants have also developed other important personal resources namely self-acceptance, self-esteem, awareness of own influence and responsibility.

Conclusion

The multi-module development programme seems appropriate for development of participants' personal resources. The increase of personal resources seems to affect participants' job resources.

Introduction

Transition from student to professional, from a safe learning environment to a professional environment with great responsibilities, means entering a period of rapid personal and professional development, often characterized by elevated levels of stress (Bogg, Gibbs, & Bundred, 2001; Brennan et al., 2010; Gilling & Parkinson, 2009; Heath, 2008; Teunissen & Westerman, 2011; Tyssen & Vaglum, 2002). Inadequate support, negative experiences, being overworked and underpaid, can make the first years after graduation a very critical period in the career and lives of the recently graduated professional (Gilling & Parkinson, 2009; Heath, 2008). Apart from a negative experience due to increased stress levels, the transition period can also be interpreted positively as challenging, full of learning opportunities and opportunities for high performance (Teunissen & Westerman, 2011). In a study among recently graduated veterinary professionals Mastenbroek et al. (2013) investigated work-related well-being and its predictors in the transition period, using the Job Demands-Resources (JD-R) model as a theoretical model (Bakker & Demerouti, 2007; Demerouti, Nachreiner, Bakker, & Schaufeli, 2001). Their results showed that one in seven Dutch veterinarians is likely to be burnt-out within ten years after graduation, while only one in eight veterinarians qualifies him/herself as highly engaged in that same period. Work-related (job demands and job resources) as well as person-related (personal resources) factors predicted well-being.

The JD-R model is a work psychological model, which posits two broad categories of work characteristics: job demands and job resources. *Job demands* are aspects of work that require sustained physical or mental effort on the part of the employee and are thus associated with psycho-physiological costs, such as work-home interference, workload, job insecurity and role conflicts. *Job resources* are work aspects that are functional in achieving occupational goals. While necessary when dealing with high job demands, they are also important in their own right as stimulants of personal growth (Bakker, Demerouti, & Euwema, 2005). Examples are, autonomy, feedback from work and support. According to the JD-R model, job demands can evoke an *energy depletion process,* potentially leading to a breakdown (or burnout) when individuals fail to recover adequately whereas job resources induce a *motivational process,* which can promote work engagement (Demerouti, Bakker, De Jonge, Janssen, & Schaufeli, 2001). In addition to job resources that promote well-being, we can also distinguish personal resources. *Personal resources* are defined as aspects of the self that are generally linked to resilience, i.e. people's sense of being in control and able to influence their environment successfully (Hobfoll, Johnson, Ennis, & Jackson, 2003). This definition encompasses a feeling of being appreciated and in

control as well as skills and attitudes that facilitate these feelings. Personal resources are negatively related to burnout and positively and reciprocal to work engagement and job resources (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009). Job and personal resources have been found particularly beneficial for employees' work engagement when job demands are high (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007). When employees proactively initiate changes in the level of job demands and job resources, this can be seen as job crafting (Tims & Bakker, 2010). Important personal resources for health care professionals and for those who have recently graduated in particular, are self-efficacy, reflective behaviour, proactive behaviour, and optimism (Bok, Jaarsma, Teunissen, van der Vleuten, & van Beukelen, 2011; Mastenbroek et al., 2013). Because of their importance for veterinarians' well-being within the first years after graduation, these personal resources are suggested to represent a target for interventions aimed at facilitating the transition period and increasing the well-being of young veterinary professionals.

For educators it is important to understand what can contribute to a more positive progress of the transition period (Bakker, Schaufeli, Leiter, & Taris, 2008). The present study was conducted to analyse the effects of an intervention on personal resources: a one-year development programme was designed for veterinary professionals who had graduated between 0 and 5 years, focusing on broadening and/or enhancing participants' personal resources.
The following questions were investigated:

1. Are self-reported levels of personal and job resources and work engagement higher at the end of the intervention as opposed to their levels at the start of the intervention?
2. How did the development programme affect participant's personal resources?
3. How did personal resources affect participants' work and work environment and participants' work engagement?

Programme design

In 2010, the Royal Netherlands Veterinary Association (RVNA) introduced a development programme for young veterinary professionals with the aim of enhancing work engagement by broadening and increasing participants' personal resources. Because the needs of participants are various, the programme was designed in a way that it enabled participants to set their own learning goals and to work thereto during the trajectory. The modules vary regarding the input they provide for reflection and learning at different levels (i.e. context, behaviour, beliefs or competencies) (Korthagen & Vasalos, 2005).

The development programme consists of:

1. An intake procedure including the analysis of learning objectives.
2. Various modules with an emphasis on reflection and experimenting with new behaviour.

All participants were enrolled in the general programme. When necessary the general programme was supplemented with individual coaching. The programme was facilitated by two professional coaches and lasted 10 months. A detailed description of the content of the general programme can be viewed in Appendix A. Registration for the programme was open to all veterinary professionals having graduated between 0 and 5 years. Recruitment of participants took place by means of an electronic newsletter from the Royal Netherlands Veterinary Association and through an announcement in the Netherlands Journal of Veterinary Science (Haneveld, 2010). There was no active selection of participants.

Method

A combined quantitative/qualitative approach was used including an online survey and semi-structured interviews.

Quantitative study

Procedure

Measurements were taken at two different moments: at the time of the onset of the development programme (Time 1), and at the time the development programme was completed (Time 2). On the first day of the programme an introduction to the research was held. At this introductory meeting the goal of the study and the entire procedure was explained, addressing the confidentiality of the data. Participants of the programme were asked to volunteer for our study. A day after the meeting, invitations to participate in the research were sent individually by e-mail to all participants of the development programme. The e-mail contained an internet link which directed the participants to an online survey. In the accompanying letter confidentiality of the data was explained. We explicitly stated that no-one else but the first researcher had access to the raw data. Two and four weeks after the distribution of the questionnaire, reminders were sent by personalized e-mail. Participants who completed the questionnaire at Time 1 received an invitation to complete the survey again at Time 2.

Participants

In total 46 participants (male/female: 9/37) entered the development programme between 2010 and 2011 in three groups starting in April 2010, September 2010 and July 2011. The male-female ratio of participants to the development programme was representative for veterinarians having graduated in the last four years. Thirty-three participants (response rate (RR) = 72%) completed the first questionnaire (Time 1; onset of the programme). Twenty-five participants (RR = 54%) completed both questionnaires (Time 1 and Time 2; when programme was completed) (male/female: 3/22) We asked respondents to fill in the names of two colleagues, whom we could send the same online survey in order to get a control group. The control group consisted of twenty-two veterinarians who were invited to complete the survey. Eighteen persons (RR = 82%) completed the first questionnaire (Time 1) (male/female: 1/17). Ten persons (RR = 45%) completed both questionnaires (Time 1 and Time 2) (male/female: 1/9).

Measures

Personal and job resources were measured using 35 items of the Veterinary Demands and Resources Questionnaire (Vet-DRQ): five personal resource scales (Self-efficacy, Reflective behaviour, Optimism, Proactive behaviour and Thoughtfulness), and six job resource scales (Decision latitude, Decision authority, Skills discretion, Support from colleagues, Support from supervisor, Feedback from work) (Mastenbroek et al., 2013). Responses on a five-point scale were used for all job resources scales (1 = never; 5 = always) and for all personal resources scales (1 = I totally disagree; 5 = I totally agree). Work engagement was measured using the nine-item version (seven-point scale: 1 = never, 7 = always) of the Utrecht Work Engagement Scale (UWES) (Schaufeli & Bakker, 2003), with work engagement as a one-dimensional construct and high scores indicating strong engagement. Background information consisted of demographic and occupational details: age, gender, number of years since graduation, number of years of work experience.

Strategy of analysis

The mean scores of personal and job resources and work engagement at Time 1 were compared with those at Time 2 using paired T-tests. Effect sizes were calculated using Cohen's *d* (Hojat & Xu, 2004).

Qualitative study

Additional to the quantitative data collection, we conducted a qualitative study comprising semi-structured interviews with participants of the development programme. These interviews were conducted six months after completing the programme, allowing for the long-term effects to be taken into account.

Procedure

The interviews were semi-structured which means that initial questions were formulated. After the initial response of the interviewee, the interviewer asked new questions for clarification or to encourage the interviewee to supplement the response. The questions were prepared on the basis of the JD-R model. The interviews were conducted by the first author (NM) and lasted approximately one hour. All interviews were audio recorded. An overview of the initial interview questions is provided in appendix B. All participants in the interviews gave informed consent in response to a letter that explicitly stated that participation was voluntary and that gave assurance of full confidentiality.

Participants

The sixteen participants for the interviews were randomly chosen out of the participants who completed the first questionnaire. We sought to interview five persons per cohort. Depending on the number of participants who completed the first questionnaire in each cohort, we approached every second or third person on the list with the question of whether he or she consented to the taking of an interview. No invitee refused. The average age was 29 years (SD 2.9). Two out of sixteen interviewees were male.

Strategy of analysis

Transcriptions of the recorded interviews were independently analysed by two of the authors (NM and PvB) by use of directed content analysis (Hsiu-Fang Hsieh & Shannon, 2005). Using the JD-R model, the researchers identified key variables as initial coding categories. Key variables were personal resources, job demands, job resources and work engagement.

Results

Quantitative study

Participants

Participants and non-participants of the programme did not differ significantly concerning the mean levels of job and personal resources and work engagement at Time 1.

Are self-reported levels of personal resources increased at the end of the intervention as opposed to their levels at the start of the intervention?

In order to investigate this question, a paired-sampled *t*-test was used for five

personal resources and six job resources. As can be seen in Table 1, a significant difference between Time 1 and Time 2 was found in participants for Proactive behaviour (Effect Size (ES) = -0.4, Self-efficacy (ES = - 0.6) and Reflective behaviour (ES = -0.6).

Qualitative study

The important themes that emerged from the interviews were the results of a reflection process that took place over the course of the development programme. Participants reflected on past work experience, results from the 360° feedback and the talent assessment. The reflection process resulted in participants reporting increased self-acceptance and self-esteem (personal resources that we did not measure in the online survey), increase of proactive behaviour and increased self-efficacy. Subsequently they reported an increase of perceived job resources and a decrease of perceived job demands. Most participants mentioned that their work engagement was unchanged or increased. Citations are labelled by participant's number (between brackets).

How did personal resources increase during the development programme?

Through sharing of experiences, corresponding feelings and thoughts, in the context of the peer coaching meetings, participants recognized that they were not alone in their uncertainty and in doubts concerning their abilities or learning capacities. This allowed a different perspective on the personal situation.

"Swapping experiences with others and hearing their stories was very fruitful, how they experienced their first years as vets, so to speak. Realizing that everybody has ups and downs and you aren't the only one going around with uncertainties. I was thinking, well, it should get better every year, until you can do everything." (1)

They became aware of their own thoughts, the areas of tension, and the choice of whether or not to identify oneself with limiting factors, thoughts, feelings or beliefs. They became aware that they had a choice whether or not to allow limiting factors determine their behaviour.

"Being a perfectionist is, like, not being allowed to make mistakes. That was more when I started work. Then you had the idea, my goodness, if I do this, then that happens and the animal dies, the client will be mad at me and then I'm a worthless vet."(10)

"And I've learned to recognize my own thinking patterns and if I get into a negative spiral I've learned to recognize it and to get myself out of it. Or at least, I know roughly how to get out of it. I don't know if I'll get out of it but at least I can see when I am in it."(5)

TABLE 1 Paired sample *t*-test results for personal and job resources, and work engagement on Time 1 (T1) and Time 2 (T2) in participants and non-participants (Standard deviations in brackets)

	PARTICIPANTS				NON-PARTICIPANTS			
	N	Means at T1	Means at T2	Effect size	N	Means at T1	Means at T2	Effect size
PERSONAL RESOURCES								
Proactive behaviour	25	2.89 (.67)	3.18 (.63)	-0.4*	10	2.83(.53)	3.15 (.64)	-0.5
Selfefficacy	25	3.37(.79)	3.76 (.43)	-0.6*	10	3.73(.34)	3.83 (.39)	-0.3
Optimism	25	3.68 (.85)	3.92(.74)	-0.3	10	4.05(.54)	3.92(.54)	0.2
Reflective behaviour	25	3.51(.82)	3.88(.41)	-0.6*	10	3.67(.63)	3.77(.52)	-0.2
Thoughtfulness	25	4.14(.40)	4.18(.63)	-0.1	10	3.95(.50)	4.15(.34)	-0.5
JOB RESOURCES								
Decision latitude	21	2.67(.66)	2.68(.70)	0.0	9	2.96(.72)	2.81(1.03)	0.2
Decision authority	21	3.00(.69)	3.16(.79)	-0.2	9	3.15(.87)	3.52(.50)	-0.5
Skills discretion	21	3.52 (.45)	3.46(.59)	0.1	9	3.59(.60)	3.52(.75)	0.1
Support colleague	21	4.12(.55)	3.99(.60)	0.1	9	4.17(.35)	4.14(.57)	0.1
Support supervisor	21	3.70(.97)	3.71(.96)	0.0	9	4.04(.59)	4.04(.73)	0.0
Feedback from work	21	2.81(.55)	2.76(.73)	0.1	9	2.70(.35)	2.93(.62)	-0.5
WORK ENGAGEMENT	21	4.48(1.06)	4.61(.85)	-0.1	9	4.99(.56)	4.89(.83)	0.1

*Note: *p < .05*

By analysing their own thoughts they realized that these thoughts caused a great deal of stress and they then learned to replace these by more constructive thoughts.

"As well, because I tell myself, OK, I do my work, I do my very best, I do it as well as I possibly can, so it's less stressful if I make a wrong decision according to the owner, because I can still tell myself that I thought that was the best decision at the time and that's why I made it."(1)

The reflection process resulted in participants reporting increased self-acceptance and self-esteem. Participants mentioned that they felt less stressed.

"Yeah, like, especially that your own opinion counts and that if somebody has a big mouth and always shuts you down, it doesn't mean that's the truth, but you can say, OK, wait a minute, I think differently and that you dare to say it. You can just say calmly I

don't agree and this is why I don't agree and it doesn't have to lead to a conflict. Partly competence and partly realizing that, my opinion counts too." (4)

Participants became aware that they always have a choice in acting and learned that they can affect situations (3, 4, 12). They learned to take responsibility for their way of working and living (2, 8, 9, 15) and what prevents them achieving the desired situation or from realizing their stronger sides (7). They learned to cope actively, be proactive and use their influence with the aim to make change happen. Training of specific skills in the course of the development programme supported participants in actually deploying new behaviour. Examples of learned skills were 'giving constructive feedback', 'refusing a request', 'engaging in conflicts', 'leading a conversation or chair a meeting'.

Refusing a request

"I realized that refusing a request is a good option and it's OK. And that has directly to do with feeling guilty towards colleagues. At first I felt bad for saying no and now I know that if don't say no, I'll have a bad day and that I'll be communicating that to colleagues and clients who come in." (2)

Taking responsibility for the way of working and way of living

"It's all about making sure you've got things sorted and that you act from a certain conviction. In any case, that you have influence on you own life, it's not something that just happens, you can choose to say yes, no, OK, maybe, I do it this way or that way." (4)

When new behaviour was carried out successfully, it strengthened their belief in their personal efficacy and their optimism. This helps the participants to break away from old patterns and fosters their optimism.

"…then I think that this has helped me to think more often, it will turn out better than I expect or it'll be." (8)

"When you see that it works it gives you more self-confidence. That is the outcome of it." (16)

How did these personal resources affect participants' work and work environment and participants' work engagement?

The reflection process, of which increased self-consciousness, an awareness of own needs and increased self-esteem resulted, had various effects on job resources and job demands. Participants mentioned that their communication with clients and colleagues improved, they communicated more and at an earlier stage (1, 4), they perceived increased support from their supervisor (5, 10) and experienced improved

relationships with colleagues (5, 7) and clients (11). They made more use of decision authority afforded by their employer (4, 5, 10), and their work-life balance improved by setting limits to workload or by prioritizing tasks (2, 4, 10, 14, 13). Sometimes the reflection process made them aware that their job did not (yet) fit their needs (1, 11, 13) or indeed fitted their needs and competencies very well (7, 3).

Decision authority

"With meetings and that, I usually said nothing because everybody had something to say and I thought, fine. Now I have a say."(10)

Communication at an earlier stage

"Now, if I'm bothered about something, I'll put it forward. At first I didn't do that at all and then I thought it's probably part and parcel of the job." (1)

Improved work-life balance

"Yes, I can distance myself better from my work, still concerned with your patients and your work but being able to close the door, so to speak, and leave it behind." (14)

Actively coping (with) high workload

"So, a whole lot of tasks which are given to me and I have to decide what has priority and what can wait. I used to get stressed out and now I can delegate better, I can say 'no' more easily to things. I can say I'll do that in a bit but I 'm finishing this first. Without feeling guilty about it. Eventually you find a way of communicating that to your colleagues without making them feel uncomfortable."(2)

The effect of increased awareness of one's own influence and consequently developing a proactive approach to work and work environment is also noticeable with respect to job demands as well as job resources. Participants experience an improved work-life balance through active coping with high workload (1, 2, 3, 4, 9, 12, 15) and actively engage in conflicts when necessary (4, 15). Participants also state that they make better use of decision authority (4) or ask for more involvement in practical affairs (2, 10, 13), they seek more feedback (5), give unsolicited feedback when necessary and show more leadership. According to participants this was recognized by clients and colleagues and often led to greater appreciation and support (9). Participants noted that commitment from the employer was a necessary condition to be able to bring about change (16).

Show more leadership

"And I've learned that I must phrase my questions differently, that I should say. I've got

such and such a patient and I want to do this or that, what would you do? That I first say what I want to do and only then ask what they want to do."(1)

Making use of decision authority

"….. that we all have a discussion before making a decision and that I want to be involved in it. Yes, I like the feeling of involvement because it motivates my work." (13)

Increased self-efficacy leads to positive feelings like comfort and satisfaction. Due to these positive feelings participants engage in other extra-role activities or in job design in such a way that the job better fits their individual abilities and preferences. In some cases the increased self-efficacy beliefs encouraged participants to search for another job that better fitted their needs and abilities (11, 5).

"What the development programme has done is that, because you think about 'how do I want my work' and 'how do I want my private life', you get a broader perspective, so to say. The point is, you think "I'm a vet and that's all", and then it's rather limited. And when your perspective broadens, you realize there is much more you can do."(14)

With regard to work engagement participants mention that it differs from day to day and completion of a survey on work engagement is just instant recording (1, 16). For some of them the development programme had no effect on their work engagement (10, 12). According to other participants, engagement increased through insight into their drives, their capabilities and their opportunities (7, 13, 14). Other participants mentioned that an increase of job resources (better communication with colleagues, decision authority, and skills discretion) improved work engagement (2, 4, 5).

Discussion

This study served two aims. *The first aim* was to evaluate the effects of a development programme for young veterinary professionals on their personal resources, job resources and work engagement. *The second aim* was to gain insight into 1) how the programme affected participant's personal resources and 2) how these personal resources affected participants' work and work environment and participants' work engagement.

The programme's effect on participants' personal and job resources and work engagement

Self-reported ratings of reflective behaviour, proactive behaviour and self-efficacy are significantly increased after the programme as opposed to their level prior to

the programme. Results of the control group were not significant, although some moderate effect sizes were found for personal resources (proactive behaviour and thoughtfulness) and for job resources (decision authority and feedback from work). With regard to the increase of reflective behaviour and self-efficacy one might assume that this might indeed be attributed to the development programme, the more so because these results are supported by the results of the qualitative part of this study. It is also in line with previous research which reveals that reflective behaviour is promoted through interactions and peer group meetings (Schaub-de Jong, Cohen-Schotanus, Dekker, & Verkerk, 2009; Tigelaar, Dolmans, Meijer, Grave, & Vleuten, 2008). The multiple modules approach might have been very helpful again in building self-efficacy. The modules provide each in a different source of influence that can build participant's efficacy beliefs (Bandura, 1982).

Job resources did not increase significantly during the program, according to our quantitative data. This is not in line with the results from the qualitative part of the study. One explanation could be that that each person worked on an own job resource and thus the overall level of job resources did not increase, but it did so for specific resources which differed per participant. Another explanation might be that changing job resources requires support from management that, if not present, may prevent generation of job resources. Finally, as the quantitative data are collected immediately after the development programme had finished, while the qualitative data were collected 6 months after the end of the programme, changes in job resources might follow the increase of personal resources and thus require more time to be developed. This same statement may apply to changes in work engagement. Schaufeli, Bakker and van Rhenen (2009) found that changes in job resources were predictive of engagement over a 1-year period.

How did personal resources increase during the development programme?

The interviews revealed that, in addition to an increase of reflective behaviour, proactive behaviour and self-efficacy, the participants have also developed other important personal resources namely self-acceptance, self-esteem, awareness of own influence and responsibility. The reflection process, which took place in the course of the programme, seemed to be a necessary step for the development of the other personal resources. According to Korthagen (2001) the reflection process is a cyclic process and consists of 4 steps namely: 1) looking back on the action; 2) awareness of the essential aspects; 3) development of alternative methods of action and 4) carrying out (new) planned behaviour. The programme enabled participants to pass through the full cycle of reflection, and hence to develop the above-mentioned personal resources. Apparently reflective skills can be an

essential competence in the promotion of a more positive course of the transition period, which takes place in the first years after graduation.

The activities during the development programme resulted, among others, in an increased awareness of their own influence on and responsibility for their work and their life: they realized they had a choice. Apparently some participants did not feel that they were in control when entering the programme. Generalized beliefs about control, which concern the extent to which individuals assume they can control outcomes of importance for them, are among those beliefs that influence primary appraisals of situation (Rotter, 1966). As Rotter says "An internal locus of control refers to the conviction that events are contingent upon one's own behaviour, and an external locus of control refers to the conviction that events are not contingent upon one's actions but upon luck, chance, fate or powerful others". These generalized expectancy beliefs have their greatest influence when a situation is ambiguous or new, which is often the case with the young veterinarians (Petrou, Demerouti, Peeters, Schaufeli, & Hetland, 2012). Apparently the programme succeeded in changing beliefs about controllability of events. When self-efficacy levels are high and individuals believe that they can influence their work-environment successfully, job demands are more likely to be perceived as challenging, and job resources as abundant (Tims & Bakker, 2010).

How did these personal resources affect participants' job demands and resources and work engagement?

The interviews showed that job resources increased in various ways. Firstly, the increased self-esteem made participants feel more confident in communicating with clients, colleagues and with their supervisor. This, together with an awareness of their own responsibility to stand up for their own needs and interests, made them search actively for job resources. Whether they succeeded depended also on the work environment and specifically the management of the practice they worked for. "Job crafting may enable employees to fit their job to their personal knowledge, skills and abilities on the one hand and to their preferences and needs on the other hand" (Tims & Bakker, 2010). Secondly, the increased self-esteem, gave them another perspective on the existing job resources. For example, thinking that they were worthless veterinarians made them blind to the existing support of colleagues. Their new, more realistic, beliefs about their own fallibilities and capabilities helped them to see that colleagues did appreciate them and were prepared to help them. Thirdly, through increased self-esteem and awareness of their own influence, they took advantage of existing job resources i.e. decision latitude and decision authority for example by taking measures to regulate the workload. The reason that job resources

were not increased immediately after completion of the programme may be that it takes some time to change levels of job resources.

With regard to work engagement, differences existed between participants. Some participants mentioned that their work engagement fluctuated daily and related to daily job resources. This is in line with results of Sonnentag (2003) and Xanthopoulou, Bakker, Heuven, Demerouti, and Schaufeli (2008). Both studies found that approximately 40 % of the overall variance on work engagement was at the day (i.e. within-individual) level.

Strengths and weaknesses

Strength of this study is the mixed methods design. The results of the qualitative study helped us in explaining the results of the quantitative study. For instance, participants mentioned that an increase of personal resources (self-efficacy and pro-active behaviour) stimulated them to search for more job resources in their present job. Increase of job resources thus seemed to follow chronologically the increase of personal resources. Possibly it takes some more time to craft a job. A weakness of this study concerns the fact that we only used self-report questionnaires and interviews for data collection. Common method bias may thus have influenced some of the results.

In order to be able to discriminate between the increase of personal resources as a result of the development programme and an increase of personal resources as a result of one more year practical experience, it was necessary to compare the results with the results of a control group that did not participate in the development programme. The control group did not show a significant increase in personal resources although some effects were moderate. One reason for this may be that the control group was very small. The results of the qualitative study support the assumption that there is a causal relationship.

Practical implications

For educators it is important to know how education or training can contribute to a more positive course of the transition period, which takes place after graduation. Firstly, this study shows that personal resources as reflective behaviour, self-esteem, awareness of own influence and responsibility, proactive behaviour and self-efficacy can be trained. Development of these resources can be initiated by guided reflection with peers. Apparently, it is important that students learn to reflect upon their experiences, their thoughts, feelings and beliefs. Through stimulation of the reflection process, limiting thoughts can be replaced by more constructive (self) beliefs and

expectations about the transition period probably can be modified to match reality. By appealing to a proactive attitude and responsibility towards one's own learning process, educators can stimulate pro-active behaviour and development of positive self-efficacy beliefs. Guiding students in discovering their own needs and core competencies may be helpful to find a job that fits these needs and competencies. It is therefore encouraging that personal development is one of seven competency domains in the veterinary competency framework (VetPro) (Bok et al., 2011) that plays an important role in the veterinary curriculum in the Netherlands.

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APPENDIX A The modules of the development programme

MODULE	AIM	INSTRUMENT	REFERENCES
Talent Assessment	Analysis of talents, motivations and development possibilities	TMA (Talent Motivation Analysis)	*www.tmamethod.com*
360 degree feedback	Generating feedback from a number of people with different perspectives on the candidate's behaviour as well as from the candidate him/herself. Its purpose is to present a broad view of the candidate's current work behaviour	360 degree feedback	*www.tmamethod.com*
E-coaching	Gain insight and understanding of own behaviour and how to change or improve that	E-learning modules	*www.tmamethod.com*
Intake meeting	To identify goals for improvement, and commitment to work on these during the programme	Not applicable	
Peer coaching meetings every 6 weeks	To share feelings and to enhance reflection and reflective skills	Peer meetings	*(Schaub-de Jong et al., 2009)*
Small group learning every 6 weeks	Various Skills training (communication, Rational emotive training, Leary's rose, how to conduct appraisal and assessment interviews, knowledge about prevention of stress and burnout, book review 'the 7 habits of highly effective people')	Small group meetings	*(van Dijk, 2000)* *(Ellis & Grieger, 1986)* *(Covey, 1989)*
Individual coaching	If required participants were invited to an individual, tailor made (by coaches) coaching session	Individual Coaching sessions	

APPENDIX B Initial questions for the interviews

1. How has the development programme affected you as a person?
2. How has the development programme and what you learned during the programme affected your work and work environment?
3. How has the development programme affected your work engagement?

CHAPTER 6

General discussion

Background

We started this thesis with some observations that underline the vulnerable position of young veterinary professionals when it comes to their mental well-being. We provided an overview of the current literature on mental well-being of health care professionals in general and in their first years after graduation in particular. It shows that research in general has mainly focused on negative aspects of work and impaired health, and that besides feelings of unpreparedness for practice and contextual factors, personal factors and personal development play a major role in mental well-being during the first years in professional practice. Research on positive mental well-being and its work- and person related antecedents in health care professions is relatively scarce. The main aim of this thesis is to identify the job characteristics (job demands and job resources) as well as personal resources that affect mental well-being (burnout and work engagement) and performance in recently graduated veterinary professionals, and to reach a greater understanding of the role of personal resources in their well-being. The first project we undertook to investigate this aim was the construction of a questionnaire that was customised to measure job demands, job resources and personal resources that could predict burnout and engagement in recently graduated veterinary professionals. That questionnaire served to measure levels of burnout and engagement and its potential predictors in this occupational group. The results are presented in chapter 2 and 3. We also examined the role of personal resources in explaining well-being and performance by extending an influential job characteristics model that predicts well-being, the Job Demands-Resources (JD-R) model, which is presented in chapter 4. Finally, we conducted a study with a mixed method design that served to explore how personal resources can be developed. The results of this study are presented and discussed in chapter 5.

In this chapter the findings presented in the previous chapters are summarized, based on the research questions derived from the central aim of this thesis. The results are reflected on in a theoretical and practical sense. Theoretical implications and implications for the profession as well as for veterinary medical education are discussed, also leading to some recommendations for future research.

Summary of findings

Levels of burnout and work engagement among male and female veterinary professionals who graduated between 1999-2009

The first study focused on the levels of burnout and work engagement of male and female veterinarians who graduated between 1999-2009. Burnout and engagement can be seen as two different, although related concepts. The core dimensions of burnout are emotional exhaustion and cynicism (Lee & Ashforth, 1993; Lee & Ashforth, 1996). Engagement is defined as a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption. Although burnout and work engagement are negatively related, 'not being burnout' does not imply 'being engaged' in this vision (Schaufeli & Bakker, 2004). The results show that although levels of exhaustion, cynicism and work engagement were significantly lower compared to a random sample of the Dutch working population, 14 % of the respondents appeared to suffer from burnout and 15 % could be classified as highly engaged. We found significant gender effects for exhaustion and work engagement showing that male veterinarians were less exhausted and more engaged than female veterinarians. Exhaustion was also negatively related to number of years since graduation. Although effect sizes were small, the effects of gender and years since graduation resulted in female veterinarians in the first 5 years since graduation being the group most at risk of developing burnout (18 %), while only 13 % could be classified as being highly engaged. Gender differences regarding occurrence of distress and/or depression were also found in studies among veterinarians in New Zealand (Gardner & Hini, 2006) and Australia (Fairnie, 2005). The latter study showed that female veterinarians younger than 35 years old were more distressed than males in this age group. Studies among Finnish practitioners found no effects of gender on exhaustion (Reijula et al., 2003), whereas the results of a study among Belgian practitioners (Hansez, Schins, & Rollin, 2008) revealed opposite effects: male practitioners appeared to be more exhausted and less engaged than female practitioners. Unfortunately the response rate in the latter study was very small. Conflicting results might indicate that gender or the number of years since graduation do not represent predictors of mental well-being but that other variables, related to these demographic factors, play a role in the greater vulnerability of female and younger veterinarians with respect to their mental health. Fairny (2005) for example found that veterinarians who were employed were significantly more distressed than practice owners. The employees were mainly female and under 35 years of age, while the majority of practice owners were male and over 35 years of age. More specifically, in that study more than 84% of males over 35 years owned a practice with only 34 % of females in the same age group. In the context of the

rapid feminisation of the profession in the past two decades, it is important to gain more insight into the work- and person related factors that predict burnout and engagement among this occupational group. This was the aim of the next study.

Potential predictors of burnout and work engagement in male and female veterinarians in the first five years after graduation

The results revealed that, in line with assumptions of the JD-R model, job demands and job resources could explain the levels of exhaustion and cynicism among veterinarians. Work - home interference and workload were the job demands most strongly and positively related to exhaustion. Job resources that were most strongly and negatively related to exhaustion differed for male and female veterinarians: male vets benefited most from support from their superior whereas female vets benefited most from decision latitude (autonomy in the job). Job demands most strongly and positively related to cynicism were role conflicts and job resources most strongly and negatively related to cynicism were possibilities for professional development. The results also show that work engagement is explained best by resources, primarily job resources and to some lesser extent also by personal resources. Job resources most strongly and positively related to work engagement were opportunities for professional development and skills discretion (i.e. the ability to use and develop skills on the job). The personal resource most strongly and positively related to work engagement was proactive behaviour. In summary, the analyses revealed some differences between men and women with regard to the relative importance of various job demands, job resources and personal resources in explaining burnout and engagement in young veterinary professionals: significant gender differences were only found for the relative contribution of superior support to the explanation of exhaustion, and for the relative contribution of self-efficacy to the explanation of cynicism. A work environment that offers many job resources might be helpful for recently graduated veterinarians with respect to both the prevalence of burnout and the preservation of work engagement. Veterinary professionals work in various domains (i.e. veterinary practice, research, educational institutes, industry or in public service). Job resources that are most beneficial may differ in various work domains. Personal resources however can be developed and deployed in any work environment. As such, they can be important targets for interventions. As research on how personal resources affect well-being in health care professionals is scarce, we performed a study that was guided by the following research question.

What is the role of personal resources in explaining well-being and performance?

The results of this study, as described in chapter 4, show that personal resources partially mediate the relationship between job resources and work engagement and are directly and indirectly related to in- and extra-role performance of young veterinary professionals (in-role performance includes tasks that are described in a job description, while extra-role performance can best be described as being involved in tasks that exceed the job description and that are often beneficial for the organization as a whole). The relationship between personal resources and extra-role performance is partially mediated by work engagement. In practical terms this means that a resourceful work environment is associated with employees having more personal resources, and that these employees appear to be more engaged and more involved in extra-role behaviour. Our results are in line with a study of Llorens, Schaufeli, Bakker and Salanova (2007) who found that self-efficacy beliefs mediate the relationship between job resources and work engagement. They also demonstrated that these relationships are reciprocal. Our study design does not allow us to make conclusions about the direction of the relationships. During the course of our studies more research on the role of personal resources has been performed and the beneficial role of several personal resources in relation to work engagement was confirmed repeatedly (Mauno, Kinnunen, & Ruokolainen, 2007; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007). According to Mäkikangas, Feldt, Kinnunen and Mauno (2013) people with more personal resources, such as self-efficacy and self-esteem, expect things to go well and their perception of the work environment is basically benign. Bakker, Tims and Derks (2012) showed that people with a proactive personality were most likely to craft their jobs, they increased their job resources (e.g. they asked for feedback and support). This resulted in higher levels of work engagement. In summary, personal resources seem to influence the way people interprete their environment as well as the particular way of initiating effective functioning and coping with difficulties. In their theoretical review of the role of personal resources in organizational change van den Heuvel, Demerouti, Bakker & Schaufeli (2010) suggest that employees are active agents who shape their environment using behavioural strategies, that are influenced by personal resources and change attitudes. These processes, that take place at employee-level, are thought to affect employee outcomes such as work engagement. Bakker (2011) also assumes that job and personal resources, independently or combined, are the main predictors of work engagement. Work engagement, in turn, has a positive impact on job performance. Our results confirm these assumptions and explain the relationships in more detail. In contrast to personality traits, personal resources can be developed and managed in order to improve well-being and job performance. Because personal

resources may be functional regardless of the working environment in which they will be deployed, we therefore presume that personal resources are an important target for interventions. The last study (as described in chapter 5) further examined the question of whether and how personal resources can be developed and how they influence perceived levels of job resources, job demands and work engagement.

Personal resources: How can they be developed?

The quantitative data of this multi-method study showed that at the end of a one-year multimodal development trajectory, participants perceive themselves as more reflective, more proactive and self-efficacious than at the beginning of the development trajectory and in contrast to the control group. Furthermore qualitative data revealed that participants had also developed other important personal resources namely self-acceptance, self-esteem and increased awareness of own influence and responsibility. According to the interviewees, these personal resources stimulated them to behave more proactively in pursuing job resources and it also changed their perspective on the available job resources and the existing job demands. What stands out in the results of the interviews is that reflective behaviour increased. Participants were of the opinion that the reflective process made them aware of their inhibiting convictions, and that they had a choice as to whether they allowed these beliefs to determine their behaviour or not. This awareness of having a choice is one of the most fundamental factors in a person's development, as it contributes to personal autonomy (Sheldon et al., 2003). According to the interviewees this awareness and thus the reflection process was a necessary step for increasing other personal resources, such as self-acceptance and self-esteem. Subsequently, the increased self-esteem, the awareness of having a choice, of being responsible, and the skills learned, stimulated participants to search proactively for possibilities to reduce job demands and to mobilize job resources. This is also referred to as job crafting. This job crafting, in turn may lead to higher levels of work engagement (Bakker et al., 2012).

Theoretical implications

The aim of our studies was to identify the job as well as person related characteristics that affect mental well-being and performance in recently graduated veterinary professionals, and to reach a greater understanding of the role of personal resources in their well-being process.

Our research into mental well-being among veterinarians is grounded in a theoretical framework, the JD-R model. The questionnaire, the construction of which is described in chapter 2, is made on the basis of this model.

Regarding the role of personal resources in mental well-being, we may conclude from the third study (chapter 4) that a resourceful work environment is related to being more engaged, partially because employees working in this environment develop and deploy more personal resources. The results from the latest study (chapter 5) show that an increase in personal resources is associated with initiatives to mobilize more job resources. The most obvious assumption, which is also consistent with other research in this area, is that personal resources and job resources interact and that interventions that affect one of them or both will be effective in promoting work engagement. The results also provide evidence for the relationship between work engagement and extra-role performance, as was also reported in other studies (Demerouti & Cropanzano, 2010). Our results show that personal resources may be integrated in the JD-R model both at a cognitive level (i.e. self-efficacy) and at a behavioural level (i.e. proactive and reflective behaviour). Concerning reflective behaviour a discrepancy seems to exist between the results of chapter 3 and 5. The results in chapter 3 reveal that perceived reflective behaviour (as a personal resource) is irrelevant in explaining variance in work engagement, while the study described in chapter 5 shows that (development of) reflective behaviour appears to be an essential step in developing other personal resources, and thus might be related to work engagement. One explanation of this discrepancy may be that reflective behaviour is indeed an essential personal resource in developing other personal resources, but specifically in individuals with low personal resources (i.e. when inhibiting convictions prevent optimal functioning, or when individual learning goals for personal development have to be identified). As the study in chapter 3 is based on all veterinarians graduated in the Netherlands between 1999 and 2009, whereas the study in chapter 5 is based on veterinarians in the first 4 years after graduation who voluntarily participated in an one-year development trajectory, the results of these studies may not be compared. A second explanation may be found in the assessment of reflective behaviour. The ability to self-assess depends upon the ability to reflect effectively on one's own behaviour, while the ability to reflect effectively requires accurate self-assessment (Eva & Regehr, 2005). If this is so, a person with few reflective abilities might answer inaccurately. This means that, in general, it can be difficult to assess reflective behaviour through self-assessment. However when participants in a personal development trajectory learn how to reflect on own behaviour, their ability to self-assess their own reflective behaviour will become more accurate. Finally it may be possible that reflective behaviour is not directly related to work engagement but that this relationship is fully mediated by other personal resources. A clearer understanding of the role of reflective behaviour in building personal resources and its relationship with mental well-being will help to guide educational efforts to increase student's personal resources and mental well-being.

Practical implications

Up to 80 % of the students attending veterinary school in the Netherlands are female currently. This causes a rapid feminisation of the veterinary profession. During the first years of their career most of them will work as an employee in veterinary practice or elsewhere. As most of the employers are male practitioners and basic needs (needs for specific job resources) of male and female veterinarians differ, it is important for both, the recently graduated employee and the employer, to invest time and effort into discovering how to create the best conditions for sustainable work engagement and high performance. Job design is a responsibility of the employer as far as it concerns the reduction of job demands to a level that is acceptable with regard to the efficiency of the organization. Ensuring sufficient job resources is a shared responsibility of employees and employers and a proactive attitude has hereby proved very constructive (Fuller & Marler, 2009). We call on female veterinarians to engage in entrepreneurship, and enjoy the benefits and challenges of being in charge of designing the own work environment while running a company. Our results also show that employees with more personal resources perform better on tasks both inside and outside the official job description (in- and extra role performance), partially due to higher work engagement. In the context of sustainable human resources, employers are advised to invest in both, the personal growth of their employees as well as in providing the necessary work-related resources. Moreover, it is the responsibility of the recently graduated veterinarian to manage his or her own personal development for example by participating in a development trajectory. Veterinary educational institutions might consider whether the veterinary curriculum is designed in a way which gives students ample opportunity to work on the development of important personal resources like reflective skills, a proactive attitude and self-efficacy. In chapter 5 we describe the evaluation of a one-year multimodular development trajectory for recently graduated veterinary professionals. Apparently this programme meets a need and educationalists may learn from this study how to support students in the development of personal resources. The way this programme is designed enables participants to work on individual learning goals, which they develop on the basis of feedback and assessment provided by the programme. Through reflection upon experience, feedback and assessment outcomes participants work on the development of individual personal resources. Reflective behaviour is a skill that is necessary to gain insight in the personal needs and for the development of strategies for new behaviour. Subsequent mastery experiences are helpful in increasing perceived self-efficacy (Bandura, 1982).

Reflection can take place on various levels, but is often focused on obtaining a 'quick fix'- a rapid solution for a practical problem. Korthagen & Vasalos (2005) developed a model that describes the different levels on which reflection can take place. The model shows various levels, which can influence the way someone functions. In addition to aspects that are generally reflected on, such as environment, behaviour and competencies, they incorporated more implicit aspects of functioning into the model, such as beliefs, professional identity and mission. Beliefs relate to how one interprets his environment and the ideas one has about, for example, colleagues, clients or good performance. Professional identity is related to self-concepts, and to how somebody perceives him or herself as a professional. Mission is related to the deepest motives for being for example a veterinary professional. This level is concerned with what inspires us, the intrinsic motivation, which is an important factor enabling people to break through the negative circle of burnout (Brummelhuis, Hoeven, Bakker, & Peper, 2011). One of the modules of the development trajectory included peer coaching meetings. Though it is known by various names (i.e. peer meetings, peer-group learning, small-group curriculum, intervisie (Dutch)), the effect of this type of education has been regularly subject to research. Peer meetings in which personal experiences from professional practice were discussed proved to foster the development of reflection skills (Schaub-de Jong, Cohen-Schotanus, Dekker, & Verkerk, 2009). An intervention for physicians based on a facilitated small-group curriculum improved meaning in work and engagement and reduced overall burnout (West et al., 2014). Based on our experiences and previous research we believe we can say that peer coaching meetings appear to be an effective instrument for the development of reflection skills and other personal resources. Empirical research into the effects of peer coaching meetings is necessary to support this assertion.

Strengths and limitations

Strengths

The studies described in this thesis investigated the contribution of several job demands and job resources and personal resources to the variance in mental well-being and performance by using different ways of data collection (i.e. self and other ratings, questionnaires and interviews) that were analysed using various statistical approaches. The studies are grounded in a theoretical framework that encompasses both positive and negative mental well-being and allowed us to measure demands and resources characteristic for the occupational group under study. The study that is described in chapter 4, contributes to the literature on the role of personal resources in work-related well-being through the inclusion of self- and other ratings

of performance as outcome measure. The focus on personal resources as predictors of well-being irrespective of the work domain, means that our results are broadly applicable to other health care professionals. Finally, a strength of the studies described in chapter 2, 3 and 4 is that the studies include a complete cohort of veterinarians graduated between 1999 and 2009 in the Netherlands.

Limitations

Because of the cross-sectional design of the studies in chapter 2, 3 and 4, we may not draw firm conclusions about the causality of the findings, although they were consistent with our hypotheses (chapter 4) and build on former research on the JD-R model and on extensive study of the literature.

A second limitation of this thesis might be the extent to which common method bias influences the results of our studies. Although we took measures to control common method bias (e.g. by collecting both self- and other ratings of the criterion variables (performances measures) in the third study (chapter 4)), we cannot exclude common method bias affecting the observed correlations between measures in chapter 3 and 4.

Finally a third limitation of this thesis might be that identification and validation of the final scales of the questionnaire (chapter 2) was carried out using the same respondents as the assessment of the relative importance of these scales in explaining variation in exhaustion, cynicism and work engagement (chapter 3) and the validation of the extended JD-R model and the hypothesized mediation effects in chapter 4. A consequence might be an overestimation of the strengths of the relationships among the constructs. As a counterforce against this limitation can be argued that 1) the entire population veterinarians, graduated between 1999 and 2009, has been approached to participate in this study, and 2) that we included other-ratings of performance measures to test the hypothesized relationships in the extended JD-R model.

Future research

In addition to the suggestions for future research that were presented in the individual chapters and in the discussion section above, we will propose some topics for future research that result from the overview we presented in this chapter.

In chapter 4 we hypothesized that job demands and personal resources would be the most important predictors of in-role performance through their relation with the

exhaustion component of burnout. The results did not support these hypotheses. The qualitative results of the study in chapter 5 however, show that participants of the development trajectory assume that an increase in personal resources affects their coping strategies regarding job demands and their perception of job demands. According to Lepine, Podsakoff & Lepine (2005), job demands can be divided into demands which promote personal growth and achievement, i.e. challenging demands (e.g. new tasks or emergencies for recently graduated vets) and demands that constrain growth and achievement, i.e. hindering demands (e.g. role conflicts and task ambiguity). Although they are both related to stress, they are differentially related to engagement and performance. Challenging demands have a positive direct effect on performance, as well as a negative indirect effect on performance through strain, and a positive indirect effect on performance through motivation. Future research might reveal whether personal resources (such as self-esteem or self-efficacy) play a major role regarding the perception of demands as a hindering or as a challenging demand.

This thesis provides evidence of the positive relationship between proactive behaviour and work engagement and performance. However, as our studies had a cross-sectional design, we may not draw conclusions about causality of these relationships. Research with a longitudinal design is needed to understand the direction of this relationship. It would be worthwhile following up on the participants of our research project, to get insight as to whether a causal relationship exists between personal resources at the time of graduation and mental well-being and performance or professional success five years later. The use of objective outcome measures (such as salary) would increase the quality of the proposed research.

Another area for future research concerns gender differences in personal resources that are positively related to mental well-being and performance. Our studies among veterinary professionals show that significant gender-related differences exist regarding the relative contribution of self-efficacy to mental well-being and that female veterinarians perceive themselves as less self-efficacious than males. These differences probably develop during undergraduate curriculum or may originate from before entrance into university. Future research is necessary to explore how self-efficacy develops during the veterinary education programme, how it affects other personal resources, students' mental well-being and study results and how it can be enhanced during veterinary education.

Conclusion

Although the mean levels of exhaustion, cynicism and work engagement among respondents in the first ten years after graduation were not alarming, female veterinarians in the first five years after graduation appeared to be the group most at risk of developing burnout. While job demands and job resources could explain levels of exhaustion and cynicism, job and personal resources best explained variance in work engagement. This thesis focuses on personal resources and their relationships to well-being and performance. It showed that personal resources are important because they determine how the work environment is perceived and interpreted. They also determine the initiatives to be undertaken to change that work environment and therefore they determine well-being and performance. Personal resources can be developed. Reflective behaviour was designated as a crucial personal resource for the development of other important personal resources. Hopefully, future research will build on our findings and continue to explore how mental well-being in young health care professionals can best be preserved. This thesis shows employers and employees some opportunities for creating a work environment that helps the young professional grow in his or her new role and to become an appreciated member of the veterinary profession. We call on educators and students to continue on their way to pay explicit attention, not only to the development of the technical veterinary competencies, but also to the non-technical competencies, with a special emphasis on the development of personal resources.

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CHAPTER 7

Summary

Mental well-being of veterinarians and other healthcare professionals is a topic that enjoyed great scientific interest in past years. It revealed that there are reasons for concern. This thesis is about the mental well-being of a specific occupational group namely the recently graduated veterinary professional at the beginning of his or her professional career.

Chapter 1 forms the introductory chapter of this thesis. It describes why mental well-being of recently graduated veterinary professionals might be at risk. An overview of the literature on mental well-being in health care professions shows that the enhancement of work-related mental well-being in health care professions is recognized as a main concern. The main focus of this research has been on poor mental health and the negative impact of job characteristics on mental health and well-being. Following the recent shift in attention towards job aspects with a positive effect on mental well-being and performance, we introduce the Job Demands-Resources (JD-R) model, an influential job characteristics model that will be used as theoretical background for our studies. The JD-R model allows us to measure burnout and work engagement as results of respectively a negative health impairment process and a positive motivational process.

Both veterinary and medical professionals perceive the first years in professional practice to be a challenging period in which they frequently experience shortcomings concerning non-technical competencies (e.g. communication, collaboration) and difficulties with new tasks (e.g. managerial tasks). In addition, they have to adapt to new roles and an unfamiliar environment. The effect that these changes have on the course and outcome of the transition and on mental well-being depends on the coping strategies and personal characteristics of the professional. The aim of this thesis is to identify, in addition to work-related aspects, person-related characteristics that affect mental well-being and performance in recently graduated veterinary professionals, and to reach a greater understanding of the role of personal resources in their well-being process.

Chapter 2 describes the construction of a tailor-made questionnaire for measuring specific work- and personal characteristics that might affect mental well-being of recently graduated veterinary professionals. According to the JD-R model two broad categories of work characteristics determining employee well-being can be distinguished: job demands and job resources. *Job demands* refer to those physical, psychological, social, or organizational aspects of the job that require sustained physical or mental effort, and are therefore associated with certain physiological and psychological costs. *Job resources* refer to those physical, psychological, social, or organizational aspects of the job that **(a)** are functional in achieving work goals,

(b) reduce job demands and the associated physiological and psychological costs, or **(c)** stimulate personal growth and development. Recently the JD-R model has been expanded by integrating personal resource measures into the model.
Personal resources are those aspects of the self that are generally linked to resilience and refer to individuals' sense of their ability to control their environment successfully. The first phase of the construction of the questionnaire consisted of three semi-structured group interviews with recently graduated veterinarians, active in different domains of the veterinary profession The interviews were conducted to identify relevant job demands, job resources, and personal resources. These demands and resources were organized in themes (constructs). For measurement purposes, scales were selected from the available literature for each theme. The full set of a priori scales, supplemented with three scales for measuring exhaustion, cynicism (being the two most important dimensions of burnout) and work engagement, were included in a preliminary questionnaire that was administered to all (1760) veterinary professionals who graduated in the Netherlands between 1999 and 2009, of which 727 veterinarians (73% females) completed the questionnaire. Exploratory factor analysis and reliability analysis were conducted before arriving at the final set of validated scales, that consisted of seven job demands scales (32 items), nine job resources scales (41 items), and six personal resources scales (26 items) all of which were considered to represent the most relevant potential predictors of work-related well-being in this occupational group. The procedure resulted in a tailor-made questionnaire: the Veterinary Job Demands and Resources Questionnaire (Vet-DRQ).

Chapter 3 reports on the assessment of the levels of burnout and work engagement and the identification of potential predictors of burnout and work engagement in veterinarians, who graduated in the Netherlands between 1999 and 2009. The results showed that levels of exhaustion, cynicism and work engagement were significantly lower compared to the norm group (a random sample of the Dutch working population). Male veterinarians were less exhausted and more engaged than female veterinarians. Exhaustion was negatively related to number of years since graduation: it decreased over the years. Although effect sizes were small, effects of gender and number of years since graduation resulted in female veterinarians in the first five years after graduation being the group most at risk of developing burnout (18 %), while only 13 % of them could be classified as being highly engaged. In line with assumptions of the JD-R model, job demands and job resources could explain the levels of exhaustion and cynicism among veterinarians. Job demands most strongly and positively related to exhaustion were work-home interference and workload. Job demands most positively related to cynicism were role conflicts. Job resources that were most strongly and negatively related to exhaustion

differed for male and female veterinarians: female veterinarians benefited most from decision latitude (autonomy in the job) while male vets benefited most from support from their superior. Job resources most strongly and negatively related to cynicism were possibilities for professional development. The results also showed that work engagement is best explained by resources. Job resources most strongly and positively related to work engagement were opportunities for professional development and skills discretion (i.e. the ability to use and develop skills on the job). The personal resource most strongly and positively related to work engagement was proactive behaviour. Summing up, significant differences between men and women concerning relative importance of various job demands, job resources and personal resources were only found for the relative contribution of support from superior to the explanation of exhaustion and the relative importance of perceived self-efficacy to the explanation of cynicism. The practical relevance of these results is that work-related well-being of young veterinarians can be enhanced not only by reducing specific job demands, but efforts could also be directed at fine tuning the provision of job resources. These resources may, on one hand, counteract the impact of demanding work conditions, but on the other hand they may enhance employees' work engagement. As employees are not passive performers of their assigned job tasks, a key issue for the veterinary curriculum appears to be the development of students' personal resources.

With the aim of enhancing our understanding of the role of personal resources in explaining mental well-being and performance, we expanded the JD-R model with personal resources. We used the JD-R model to test the relationships of personal resources with job demands and job resources, exhaustion, work engagement as well as self- and other ratings of performance. The results are presented in **Chapter 4.** In addition to the data of the population based survey, conducted among all veterinarians that graduated from a Dutch university between 1999 and 2009, we generated data from 235 of their superiors and colleagues. We hypothesized that (1) job resources (autonomy, feedback from work and support of colleagues) would be the predictor of work engagement, through their relationship with personal resources (proactive behaviour, reflective behaviour and self-efficacy), (2) job demands (workload, physical workload and work home conflict) would predict in-role performance, through their relationship with exhaustion, and (3) job resources would predict extra-role performance through their relationship with work engagement. In addition, we hypothesized that personal resources have a positive relationship with (4) in-role- and (5) extra-role performance through their relationship with respectively exhaustion and work engagement. The results of structural equation modeling analysis largely supported the model and its

hypothesized relationships and implicate that personal resources have an important mediating and initiating role in explaining work engagement and performance in young veterinary professionals.

Chapter 5 describes a study with a mixed methods design that investigates whether and how personal resources can be developed. Personal resources are defined as aspects of the self that are generally linked to resilience. With the aim of enhancing personal resources of recently graduated veterinarians, a one-year development programme was designed. This study was conducted to analyse 1) if and how the development programme altered participants' personal resources, and 2) how the possible alteration of personal resources related to the participants' job resources and work engagement. A combined quantitative/qualitative approach was used. Twenty-five out of forty-six participants and ten out of twenty-two non-participants completed an online survey covering five personal resources, six job resources and work engagement before entering and immediately after finishing the programme. In addition sixteen interviews were taken six months after finishing the programme. The interviews were analysed using directed content-analysis. The results showed that, in contrast to the control group, participants' self-reported ratings of reflective behaviour, proactive behaviour and self-efficacy were significantly increased after the intervention as opposed to their levels at the start of the intervention. Analysis of the interviews revealed that participants had also developed other important personal resources namely self-acceptance, self-esteem and awareness of their own influence and responsibility. The reflection process, which took place in the course of the programme, seemed to be a necessary step for the development of the other personal resources. The increase of personal resources seemed to affect participants' job resources in various ways. Firstly, it made them search actively for more job resources e.g. feedback. Secondly, their perspective on existing job resources changed (e.g. recognition of support). Thirdly, they took advantage of the existing job resources for example by using their autonomy for regulation of job demands. Employees attempts to change levels of job demands and job resources, in other words to redesign their own jobs, in ways that can foster work engagement is called job crafting. Finally we discussed the way the multi-module development programme might have contributed to the results.

In **Chapter 6** we combine the findings of the individual studies this thesis consists of. The first part of this chapter reviewed the main findings. We conclude that female veterinarians in the first five years of their career appear to be more sensitive to developing a burnout and a decrease in work engagement than male veterinarians. Job demands and resources can explain variance in burnout, while

job and personal resources explain best variance in work engagement. As personal resources can be developed and deployed in any work environment, they can be important targets for interventions. A multi-module development trajectory for recently graduated veterinary professionals seemed to be an effective intervention for enhancing personal resources. The results are reflected on in a theoretical and practical sense. This thesis contributes to the literature on the role of personal resources in work-related well-being in several respects. First, we showed that personal resources predict extra-role performance through the relationship with work engagement. Second, we found that personal resources partially mediate the relationship between job resources and work engagement. Practical implications relate to the shared responsibility of employers and employees concerning job (re)design, and to the responsibility of both students, graduates and veterinary educational institutes as regards the development of important personal resources, with reflection skills seeming to be essential for the development of other personal resources. Subsequently the strengths and limitations of this thesis are discussed. Strengths relate to the data-collection, the statistical approaches, the foundation of the studies in a valid theoretical framework and finally the broad applicability of the results to other health care professions. Limitations include the possibility of the existence of common method bias due to measuring of predictor and criterion variables at the same point in time (the cross-sectional design), and obtained from the same persons. These limitations implicate that causality of the relationships has to be confirmed in future longitudinal research, preferably using more objective measures for criterion variables. Finally some suggestions for future research were presented. As it remains largely unclear from our studies if and how personal resources influence the relationship between job demands and exhaustion, this might be a second area for future research. Finally, the role of reflective behaviour in building personal resources, how reflective skills can best be developed in an educational setting and the gender related differences concerning the role of self-efficacy in work-related well-being provide ample possibilities for further research.

APPENDIX

Samenvatting

Woorden van dank

Curriculum Vitae

Samenvatting

Het psychisch welzijn van dierenartsen en andere zorgprofessionals mag sinds enkele decennia rekenen op toenemende belangstelling van wetenschappers. Dit proefschrift gaat over het welzijn van een specifieke groep professionals, namelijk de recent afgestudeerde veterinaire professional die zich bevindt aan het begin van zijn carrière.

Hoofdstuk 1 geeft antwoord op de vraag waarom juist het welzijn van deze specifieke groep in gevaar zou kunnen zijn. Allereerst wordt een overzicht gegeven van de meest recente literatuur met betrekking tot psychisch welzijn van dierenartsen in het algemeen. Analyse van deze literatuur laat zien dat zowel nationaal als internationaal het psychisch welzijn van dierenartsen herkend wordt als een punt van zorg. Er lijkt een samenhang te bestaan met leeftijd en geslacht, waarbij toenemende leeftijd en mannelijk geslacht positief samenhangen met psychische welzijn. De meeste studies richten zich op verminderd psychisch welzijn (zoals incidentie van depressieve klachten, angststoornissen, burnout en suïcide). De mogelijke oorzaken hiervoor worden vooral gezocht in de kenmerken van het werk en de werkomgeving. Slechts een enkele maal is er aandacht voor positieve aspecten van werk. In navolging van de opkomst van de positieve psychologie in het afgelopen decennium, waarbij vooral gekeken wordt naar kenmerken van het beroep die een positieve invloed hebben op het psychisch welzijn en de prestaties van werknemers, wordt in dit hoofdstuk het Job-Demands-Resources (JD-R) model geïntroduceerd. Het JD-R model biedt de mogelijkheid inzicht te krijgen in oorzaken en gevolgen van zowel de negatieve psychologische toestand *(burnout)*, als ook van de positieve toestand *(bevlogenheid)*. Het JD-R model dient als theoretische basis voor al onze studies.

Voor zowel veterinaire als medische professionals zijn de eerste jaren in de praktijk een periode die gekenmerkt wordt door grote uitdagingen. Een periode waarin zij regelmatig ervaren dat ze tekortschieten met name met betrekking tot de niet-technische competenties zoals bijvoorbeeld communicatie met de cliënt c.q. patiënt, en inter-professioneel samenwerken. Tevens ervaren zij moeilijkheden bij het uitvoeren van nieuwe, tot dan toe onbekende werkzaamheden en moeten zij zich voegen in een andere rol dan voorheen. Een rol die uitgevoerd wordt in een nieuwe, vaak onbekende, omgeving. Het effect van al deze veranderingen op het psychisch welzijn hangt af van de wijze waarop met deze veranderingen omgegaan wordt (coping strategieën) en van persoonlijke kenmerken van de professional. Het doel van dit proefschrift is enerzijds het identificeren van de werk- en persoonlijke

kenmerken die van invloed zijn op het psychisch welzijn en de prestatie van de pas afgestudeerde dierenarts, en anderzijds te komen tot een groter begrip van de rol van persoonlijke kenmerken in dat proces.

Hoofdstuk 2 beschrijft de procedure die gevolgd is bij de constructie van een vragenlijst die beoogt de specifieke werk- en persoonsgerelateerde kenmerken te meten die invloed hebben op het psychisch welzijn van recent afgestudeerde dierenartsen. Volgens het JD-R model is burnout het gevolg van een *uitputtingsproces* dat veroorzaakt wordt door de aanwezigheid van hoge *taakeisen* (die als stressoren fungeren) en de afwezigheid van hulpbronnen, terwijl *bevlogenheid* de uitkomst is van een *motivationeel proces* dat zijn oorsprong vindt in de aanwezigheid van hulpbronnen op het werk. *Taakeisen* zijn die fysieke, psychische, sociale en organisatie kenmerken die een constante fysieke of mentale inspanning vereisen en als zodanig geassocieerd worden met fysiologische of psychologische kosten (b.v. hoge werkdruk, lastige arbeidsomstandigheden). *Hulpbronnen* verwijzen naar die fysieke, psychologische of sociale kenmerken van het werk of organisatie kenmerken van het werk die a) functioneel zijn om een doel te bereiken (b.v. feedback) b) helpen om de taakeisen en de daarmee gepaard gaande fysieke of psychologische kosten te verminderen (b.v. autonomie en steun) c) persoonlijke en professionele groei stimuleren (b.v. (na)scholing). Naast kenmerken van het werk zijn recentelijk ook persoonlijke hulpbronnen opgenomen in het JD-R model. Persoonlijke hulpbronnen zijn psychologische kenmerken of aspecten van het zelf die verband houden met iemands weerbaarheid. Zij verwijzen naar het vermogen om de omgeving op een succesvolle manier te beïnvloeden of daar controle over te hebben. Voorbeelden zijn optimisme, waargenomen eigen competentie en zelfvertrouwen. De procedure voor de constructie van de vragenlijst bestond uit twee fasen. De eerste kwalitatieve fase bestond uit semigestructureerde interviews met drie groepen recent afgestudeerde dierenartsen die werkzaam waren in diverse sectoren van het beroepsveld. Het doel van de interviews was het identificeren van de voor deze groep relevante taakeisen en persoonlijke en werkgerelateerde hulpbronnen. In de tweede fase is gebruik gemaakt van de literatuur, om de informatie uit de interviews te categoriseren in een aantal te onderscheiden constructen (thema's). Voor de operationalisatie van de constructen is zoveel mogelijk gebruik gemaakt van bestaande, gevalideerde schalen. Dit resulteerde in een voorlopige vragenlijst bestaande uit 26 schalen inclusief drie schalen voor het meten van emotionele uitputting en cynisme (als belangrijkste dimensies van burnout) en bevlogenheid. Deze vragenlijst is uitgezet onder 1760 dierenartsen die afgestudeerd zijn tussen 1999 en 2009. De vragenlijst is volledig ingevuld door 727 dierenartsen (waarvan 72 procent vrouw). Exploratieve factoranalyse en betrouwbaarheidsanalyse leidden uiteindelijk tot

de definitieve vragenlijst bestaande uit 7 schalen voor taakeisen, 9 schalen voor werkgerelateerde hulpbronnen en 6 schalen voor persoonlijke hulpbronnen. Deze schalen vertegenwoordigen de meest relevante potentiële voorspellers van psychisch welzijn van deze specifieke groep dierenartsen. De procedure resulteert daarmee in een op maat gemaakte vragenlijst: the Veterinary Job Demands and Resources Questionnaire (Vet-DRQ).

Hoofdstuk 3 rapporteert over de uitkomsten van een studie onder alle dierenartsen die zijn afgestudeerd in Nederland tussen 1999 en 2009. In deze studie zijn de prevalentie van burnout en bevlogenheid gemeten. Daarnaast zijn potentiële voorspellers van burnout en bevlogenheid in dit deel van de beroepsgroep geïdentificeerd. De gemiddelde score van zowel emotionele uitputting en cynisme als ook van bevlogenheid van de participanten was lager dan het gemiddelde niveau van emotionele uitputting, cynisme en bevlogenheid van een willekeurig gekozen steekproef van de Nederlandse beroepsbevolking. Er was een geringe invloed zichtbaar van geslacht en het aantal jaren na afstuderen: mannelijke dierenartsen bleken minder uitgeput en meer bevlogen te zijn dan vrouwelijke dierenartsen en de gemiddelde score op emotionele uitputting was lager naarmate dierenartsen langer afgestudeerd waren. Alhoewel de effecten gering waren bleek het risico op het ontwikkelen van een burnout het grootst (18%) te zijn voor vrouwelijke dierenartsen in de eerste jaren na afstuderen. In overeenstemming met de belangrijkste assumpties van het JD-R model voorspelden taakeisen en werkgerelateerde hulpbronnen de mate van uitputting en cynisme van participanten terwijl bevlogenheid het best voorspeld werd door zowel werkgerelateerde als persoonlijke hulpbronnen.

Van de taakeisen waren 'werk - thuis interferentie' en 'werkdruk' het sterkst en positief gerelateerd aan emotionele uitputting. 'Rolconflicten' (zoals b.v. conflicterende opdrachten) waren het sterkst en positief gerelateerd aan cynisme. De werkgerelateerde hulpbronnen die het sterkst en negatief gerelateerd waren aan emotionele uitputting verschilden voor mannen en vrouwen: vrouwelijke dierenartsen leken het meest te profiteren van meer 'regelruimte' terwijl mannelijke dierenartsen het meest baat leken te hebben van 'steun van leidinggevende'. 'Mogelijkheden voor professionele ontwikkeling' waren het sterkst negatief gerelateerd aan cynisme.

Van de werkgerelateerde hulpbronnen bleken het ervaren van voldoende 'mogelijkheden voor professionele ontwikkeling' en het hebben van 'uitdagend en afwisselend werk' het sterkst en positief gerelateerd aan bevlogenheid. Van de gemeten persoonlijke hulpbronnen vertoonden 'proactiviteit' bij zowel mannen als

vrouwen, en 'waargenomen eigen competentie' (self-efficacy) alleen bij vrouwen, de sterkste samenhang met bevlogenheid.

Concluderend bleken de significante verschillen tussen mannen en vrouwen voor wat betreft het relatieve belang van de verschillende taakeisen en werkgerelateerde en persoonlijke hulpbronnen zich te beperken tot de bijdrage van de ervaren 'steun van de leidinggevende' bij het verklaren van burnout bij mannelijke dierenartsen en de bijdrage van 'waargenomen eigen competentie' bij het verklaren van burnout bij vrouwelijke dierenartsen. De praktische relevantie van deze resultaten is dat het welzijn van jonge dierenartsen kan worden verbeterd enerzijds door het verminderen van specifieke taakeisen, maar zeker ook de aanwezigheid van voldoende en op de werknemer afgestemde hulpbronnen in de werkomgeving. Deze werkgerelateerde hulpbronnen kunnen de werknemer helpen bij het verminderen van de taakeisen en kunnen daarnaast een positieve invloed hebben op de bevlogenheid van de dierenarts. Omdat jonge dierenartsen geen passieve uitvoerders zijn van de aan hun toegewezen taken, zou een kernpunt van het curriculum moeten zijn de ontwikkeling van de persoonlijke hulpbronnen (zoals een proactieve houding) van de student.

Om meer inzicht te krijgen in de rol van persoonlijke hulpbronnen bij het verklaren van burnout, bevlogenheid en prestatie werd een conceptueel model getoetst waarbij het JD-R model werd uitgebreid met persoonlijke hulpbronnen en prestatie. Deze studie wordt beschreven in **Hoofdstuk 4.** Prestaties werden gemeten door zowel de werknemer als ook (en waar mogelijk) de werkgever of een collega te vragen de prestatie te scoren op twee domeinen namelijk de prestaties op taken die tot het formele takenpakket behoren en de organisatie-doelen dienen (in-rol prestatie) en de prestaties op taken buiten het formele takenpakket die het functioneren van de organisatie ten goede komen zoals b.v. het helpen van collega's (extra-rol prestatie). Er werd voorspeld dat persoonlijke hulpbronnen de relatie tussen werkgerelateerde hulpbronnen en bevlogenheid zouden mediëren. De resultaten ondersteunen deze veronderstelling: in een werkomgeving met veel hulpbronnen (regelruimte, feedback en steun van collega's) ervaren en ontwikkelen mensen meer persoonlijke hulpbronnen (waargenomen eigen competentie, proactiviteit en reflectiviteit). Deze personen zijn vervolgens ook meer bevlogen met betrekking tot hun werk. Daarnaast werd voorspeld dat de positieve relatie tussen zowel werkgerelateerde als persoonlijke hulpbronnen en extra-rol prestatie wordt gemedieerd door bevlogenheid. Ook deze veronderstelling wordt door de resultaten van deze studie bevestigd. Dat wil zeggen dat zowel een werkomgeving met veel hulpbronnen als werknemers met veel persoonlijke hulpbronnen een grotere bevlogenheid ervaren

en dat deze grotere bevlogenheid positief samenhangt met de prestaties buiten het formele taakgebied. Als laatste werd voorspeld dat uitputting zowel de negatieve relatie tussen taakeisen en in-rol prestatie medieert als ook de positieve relatie tussen persoonlijke hulpbronnen en in-rol prestatie. Voor deze beide veronderstellingen werd geen ondersteuning gevonden. Wel was er een directe positieve samenhang tussen persoonlijke hulpbronnen en zowel in-rol als extra-rol prestatie. De bevindingen van deze studie bevestigen dat persoonlijke hulpbronnen een belangrijke mediërende en initiërende rol hebben bij het verklaren van met name het motivationele proces waarvan bevlogenheid en prestaties een uitkomst zijn.

In **Hoofdstuk 5** wordt een studie met een gemengd (kwantitatief en kwalitatief) design beschreven. Onderzocht werd 1) of en hoe persoonlijke hulpbronnen ontwikkeld kunnen worden en 2) hoe eventuele veranderingen in persoonlijke hulpbronnen samenhangen met hulpbronnen in de werkomgeving van de deelnemers en met hun bevlogenheid. De vraag of en hoe persoonlijke hulpbronnen ontwikkeld kunnen worden werd onderzocht met behulp van een vragenlijst onderzoek onder deelnemers aan een ontwikkeltraject voor jonge dierenartsen. Het ontwikkeltraject duurde een jaar en had een multimodulair karakter. Deelnemers werkten individueel en in groepsbijeenkomsten aan persoonlijke doelstellingen. Deelname aan het ontwikkeltraject was vrijwillig. Aan de deelnemers is gevraagd om zowel aan het begin als aan het einde van het traject vijf persoonlijke en zes werkgerelateerde hulpbronnen en de eigen bevlogenheid te scoren. De vragenlijst werd volledig ingevuld door 25 van de 46 deelnemers. Daarnaast werden ook 22 personen benaderd die niet aan het ontwikkeltraject deelnamen. Van hen hebben 10 personen de vragenlijst op dezelfde momenten ingevuld. Zij vormden de controlegroep. Het kwantitatieve deel van de studie bestond uit semigestructureerde interviews die afgenomen werden bij 16 deelnemers ongeveer 6 maanden na afloop van het ontwikkeltraject. In tegenstelling tot de scores van de controlegroep waren de scores op de waargenomen eigen competentie, op proactiviteit en op reflectiviteit bij de groep deelnemers na afloop van het ontwikkeltraject significant hoger dan aan het begin van het traject. Geïnterviewde deelnemers zeiden daarnaast ook nog andere persoonlijke hulpbronnen te hebben ontwikkeld namelijk zelfacceptatie, zelfwaardering, en bewustwording van de eigen invloed en eigen verantwoordelijkheid. Het ontwikkelen van reflectievaardigheden, als onderdeel van het ontwikkeltraject, leek een noodzakelijke voorwaarde te zijn voor de ontwikkeling van de genoemde persoonlijke hulpbronnen. De toename van persoonlijke hulpbronnen beïnvloedde op verschillende manieren de aanwezigheid van hulpbronnen in de werkomgeving. Ten eerste gingen de deelnemers actief op zoek naar hulpbronnen (bijvoorbeeld het vragen om feedback). Ten tweede

veranderde soms de perceptie op de aanwezig hulpbronnen (bijvoorbeeld steun van collega's die voorheen niet als zodanig herkend werd). Ten derde maakten ze meer gebruik van de reeds aanwezig hulpbronnen (bijvoorbeeld het beter gebruiken van de regelruimte door het delegeren van werkzaamheden). Het initiëren, door de werknemer, van veranderingen met betrekking tot de taakeisen en de werkgerelateerde hulpbronnen, op een manier die de motivatie voor het werk kan doen toenemen wordt ook wel 'job crafting' genoemd. In dit hoofdstuk wordt bediscussieerd hoe het multimodulaire programma mogelijkerwijs heeft bijgedragen aan de beschreven resultaten.

In **Hoofdstuk 6** worden de belangrijkste resultaten van de verschillende studies in samenhang met elkaar besproken. Vrouwelijke dierenartsen lijken met name tijdens de eerste jaren na afstuderen gevoeliger te zijn voor het ontwikkelen van een burnout en het verminderen van motivatie dan mannen in die periode. De variantie in burnout wordt het best verklaard vanuit verschillen in taakeisen en de op de werkplek aanwezige hulpbronnen. Variantie in bevlogenheid wordt beter verklaard vanuit verschillen in de aanwezigheid van zowel werk- als persoongerelateerde hulpbronnen. Daar persoonlijke hulpbronnen ontwikkeld en ingezet kunnen worden in diverse werkomgevingen kan het een belangrijk aangrijpingspunt vormen voor interventies die als doel hebben de bevlogenheid te bevorderen en burnout te verminderen. Een multimodulair ontwikkeltraject voor pas afgestudeerde dierenartsen leek een effectieve interventie te zijn voor de ontwikkeling van persoonlijke hulpbronnen. In dit hoofdstuk worden de resultaten in theoretische en praktische zin beschouwd. Dit proefschrift draagt bij aan de literatuur over de invloed van persoonlijke hulpbronnen op het psychisch welzijn in meerdere opzichten. Ten eerste werd aangetoond dat de werknemers met meer persoonlijke hulpbronnen beter presteren op taken buiten de officiële taakomschrijving die het functioneren van de organisatie ten goede komen (extra-rol performance), en dat dit samenhangt met een grotere bevlogenheid van deze werknemers. Ten tweede werd bevestigd dat de positieve relatie tussen werkgerelateerde hulpbronnen en bevlogenheid gedeeltelijk gemedieerd wordt door persoonlijke hulpbronnen. De praktische implicaties van de resultaten in dit proefschrift zijn dat het welzijn van jonge professionals verbeterd lijkt te kunnen worden door zowel de (her)inrichting van de werkplek (waarbij de aandacht óók moet uitgaan naar de aanwezigheid van voldoende hulpbronnen) als ook door de persoonlijke ontwikkeling van de professional (de ontwikkeling van diens persoonlijke hulpbronnen). Het (her)inrichten van de werkplek is een gedeelde verantwoordelijkheid van werkgever en werknemer. Studenten, opleiders c.q. opleidingsinstituten maar ook reeds afgestudeerde dierenartsen hebben ieder

voor zich verantwoordelijkheid ten aanzien van de ontwikkeling van persoonlijke hulpbronnen waarbij reflectievaardigheden essentieel lijken te zijn om te komen tot ontwikkeling van andere persoonlijke hulpbronnen. Vervolgens worden in dit hoofdstuk de sterke en minder sterke punten van dit proefschrift besproken. Sterke punten hangen samen met de data verzameling, de statistische benadering van de data, de theoretische onderbouwing van de studies en de brede toepasbaarheid van de resultaten voor andere professies in de zorg. Minder sterk is de kans dat resultaten enigszins vertekend zouden kunnen zijn ten gevolge van het gebruik van één meetinstrument voor het meten van predictoren en uitkomst, en het cross-sectionele ontwerp waardoor oorzakelijke verbanden niet direct kunnen worden aangetoond. Longitudinaal onderzoek zou deze oorzakelijke verbanden beter vast kunnen stellen. Vervolgonderzoek met meer objectieve uitkomstmaten zou een eventuele vertekening van de resultaten kunnen verminderen. Ter afsluiting worden in dit hoofdstuk enige suggesties gedaan voor vervolgonderzoek. Deze betreffen de grotendeels onduidelijke rol van persoonlijke hulpbronnen in de relatie tussen taakeisen, uitputting en prestatie. In het kader van vervolgonderzoek is ook zeker interessant de relevantie van reflectievaardigheden voor het ontwikkelen van andere persoonlijke hulpbronnen en de sexe-verschillen betreffende de perceptie van de waargenomen eigen competentie en de invloed daarvan op het psychisch welzijn.

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Als de dag van gisteren staat op mijn netvlies het moment dat Peter van Beukelen aan mij vroeg of ik wilde komen werken bij de Leerstoel Kwaliteitsverbetering van Diergeneeskundig Onderwijs. Ik zou onderzoek gaan doen naar de effecten van het onderwijs professioneel gedrag. Na jaren de mouwen opgestroopt te hebben in de praktijk, moest ik dit voorstel even op mij laten inwerken. Maar niet zo lang. Het besluit om deze vraag positief te beantwoorden was een van de betere besluiten in mijn leven. Mijn andere ik kon zich uitleven in het onderzoekstraject dat zich manifesteert in dit proefschrift, door sommigen ook wel “het boekje” genoemd.

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Curriculum Vitae

Nicole Mastenbroek was born on April 4th 1959 in Geleen, the Netherlands. She was educated at St Michiel Scholengemeenschap in Geleen. After having studied animal sciences at Wageningen University for one year, she moved to Utrecht to study veterinary medicine at Utrecht University. In 1985, she graduated and subsequently spent 6 months working on a large livestock cooperative in Peru.

Back in the Netherlands she worked in veterinary practice until 2004. During these years most of her activities concerned monitoring herd health and production management on dairy farms. As well as veterinary work she immersed herself in practice management, specifically its financial affairs and personnel management. Through mergers and acquisitions, the veterinary practice expanded from 2 to 17 veterinarians and became one of the biggest veterinary practices in the Netherlands (Dierenzorggroep Lek & Linge, Hoornaar). In these years she was also member of the board of the local Rabobank (1991-2004). However, Nicole was not only interested in animals and entrepreneurship, but increasingly also in people and human behaviour. During her last years as a veterinary practitioner she started studying Labour and Organizational Psychology at the Open University. She continued this study at the Faculty of Social and Behavioural Sciences, Utrecht University, where she graduated in 2009. She has been a member of the supervisory board of the Royal Dutch Veterinary Association from 2005-2012.

Since 2005 she has been working at the Faculty of Veterinary Medicine. She started as a lecturer teaching collaboration skills. Since 2007 she has been chairman of, and lecturer in the course on professionalism. She combines these functions with working on her PhD under supervision of Professor Dr. van Beukelen chair holder of the chair Quality Improvement in Veterinary Education. In 2013 she obtained the University Teaching Qualification. In 2009 she won the “Best Paper Award’ of the Netherlands Association for Medical Education (NVMO) with a study describing the construction of a tailor-made questionnaire for measuring potential predictors of burnout and engagement among young veterinary professionals (chapter 2 of this thesis). Nicole is especially interested in personal and professional development in order to help people realize their full potential. She strives to contribute to the personal and professional development of those who study or have graduated at the faculty of Veterinary Medicine.

Nicole lives with her husband Giel van Berkel and her son Sander Heutink in Giessenburg. Her leisure activities include cycling, hiking and playing the piano.

Notes