

Workaholism, burnout and well-being among junior doctors: The mediating role of role conflict

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This study, conducted on a nation-wide sample of Dutch junior doctors (also called medical residents) ($N = 2115$), investigated the unique relationships of workaholism with burnout and well-being, and hypothesized that (inter- and intra-) role conflict would mediate these effects. The results of multi-group structural equation modelling analyses offered support for this model. Specifically, role conflict fully mediated the relationships between workaholism (i.e. working excessively and working compulsively) and job demands (i.e. emotional, mental and organizational demands) on the one hand, and burnout (i.e. emotional exhaustion, depersonalization and reduced medical accomplishment) and well-being (job satisfaction, happiness and perceived health) on the other hand. This indicates that workaholism contributed incrementally to explaining positive (well-being) and negative (burnout) outcomes beyond common indicators of job demands.

Keywords: burnout; role conflict; workaholism; junior doctors; medical residents; work-related stress

Introduction

Since the introduction of the concept in the late 1960s (Oates, 1968), scientific interest in workaholism has been growing, particularly during the last 15 years or so. A literature search using *PsychInfo* revealed that over that period 184 articles on workaholism have been published, and that the publication rate has doubled every 5 years from 1990 onwards (Taris & Schaufeli, 2007). Nevertheless, our knowledge about workaholism is still quite limited because most studies have dealt with the measurement of workaholism and with its correlates, rather than with the processes involved (McMillan, O'Driscoll, & Burke, 2003).

The current study tries to fill this void by proposing a model assuming that workaholism is indirectly related to employee burnout and well-being through intra- and inter-role conflict. Moreover, the model proposes that job demands are related to these outcomes in a similar indirect way, and that both workaholism and job

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demands (although positively related) make an independent contribution to intra- and inter-role conflict. Following positive occupational psychology (Luthans & Youssef, 2007), not only negative but also positive outcomes are included in our model that is displayed in Figure 1. The basic tenet of the model is that workaholism impacts on employee well-being through role conflicts and that this is independent of employees' perceptions of their job demands. We tested this model in junior doctors (also called medical residents) who almost by definition experience problems in combining their roles as doctor and trainee and who, despite being a prototypical risk-group (e.g. Harpaz & Snir, 2003; Scott, Moore, & Miceli, 1997), have not been included before in a study on workaholism.

The nature of workaholism

The most obvious characteristic of workaholics is that they work far beyond what is required. Consequently, they devote an excessive amount of time and energy to their work, thereby neglecting other spheres of life (e.g. Buelens & Poelmans, 2004; Mudrack & Naughton, 2001). For instance, North American workaholics work on average 50–60 hours per week (Brett & Stroh, 2003). However, conceiving workaholism exclusively in terms of the number of working hours would be wrong because it would neglect its addictive nature. After all, people may work long hours without being addicted to it for many reasons, including financial problems, poor marriage, social pressure or career advancement. Rather than being motivated by such external factors, a typical work addict is motivated by an obsessive internal drive that (s)he cannot resist. Hence, we define workaholism as an irresistible inner drive to work excessively hard (Schaufeli, Taris, & Bakker, 2008). So in our view, workaholism includes two elements: a strong inner drive and working hard.

Our two-dimensional conceptualization of workaholism corresponds with the original meaning of the term as it was used by Oates (1971), who described workaholism as "... the compulsion or the uncontrollable need to work incessantly" (p. 11). Analogously to alcoholics, for workaholics their need to work is so exaggerated that it endangers their health, reduces their happiness and causes a deterioration in their interpersonal relations and social functioning, he argued. In addition, various overviews confirm that both dimensions feature across most definitions of workaholism. For instance, Scott et al. (1997) observed that virtually all definitions assume that workaholics: (1) spend a great deal of time on work activities when given the discretion to do so—they are excessively hard workers; (2)

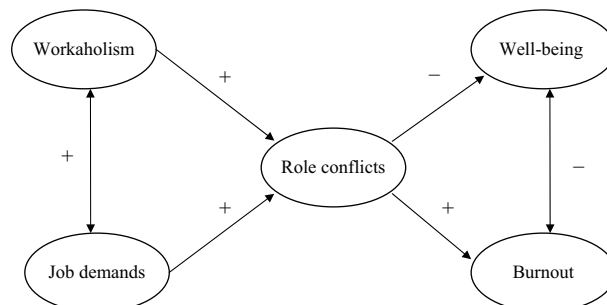


Figure 1. The research model.

are reluctant to disengage from work and they persistently and frequently think about work when they are not at work—they are obsessed workers; and (3) work beyond what is reasonably expected from them to meet organizational or economic requirements. The latter is in fact a specification of the first and the second features, because it deals with the motivation to spend an excessive amount of time to work. Taken together, Scott et al.'s conceptual analyses revealed that workaholics work harder than is required out of an obsessive inner drive, and *not* because of external factors. In a similar vein, in seven of the nine workaholism definitions that were recently listed by McMillan and O'Driscoll (2006), working excessively hard and being propelled by an obsessive inner drive are mentioned as core characteristics. Finally, a recent analysis of scholarly definitions by Ng et al. (2007) concludes that hard work at the expense of other important life roles and an obsessive internal drive to work are the two core aspects of workaholism.

Taken together, it seems that a common denominator exists of workaholism: the tendency to work excessively hard in a compulsive way. Working excessively hard represents its behavioural component that indicates that workaholics tend to allocate an exceptional amount of their time and energy to work and that they work beyond what is reasonably expected to meet organizational or economic requirements. Working compulsively represents the cognitive component of workaholism and indicates that workaholics are obsessed with their work and persistently and frequently think about work, even when not being at work.

Workaholism, role conflicts and outcomes

Following human capital theory (Becker, 1991, 1993), we posit that employees have access to a finite pool of resources in terms of time (allocated to behaviours) and energy (both physical and psychological). Human capital theory argues that people prioritize broad domains of activity (e.g. work, family and leisure) that they are willing to allocate resources to, and then make choices about how to spend their resources. Typically, workaholics spend an excessive amount of time working at the expense of non-work activities (see previous section). Since time and energy are finite commodities, time and energy spent at work cannot be spent in another domain such as home and family. This reasoning is also compatible with the role scarcity hypothesis of Edwards and Rothbard (2000). Hence, inter-role conflict is likely to occur because role expectations from work and non-work domains are mutually incompatible. This means that participation in the home and family domain is frustrated by the workaholic's excessive commitment to the work role. Indeed, research has consistently shown that workaholics experience more work-home conflict than others (Aziz & Zickar, 2006; Bakker, Demerouti, & Burke, 2009; Bonebright, Clay, & Ankenmann, 2000; Burke, 2008; Taris, Schaufeli, & Verhoeven, 2005). Moreover, levels of marital estrangement are higher among workaholics than among non-workaholics (Robinson, Flowers, & Carroll, 2001).

Following the logic of human capital theory once more, intra-role conflicts are likely to occur as well, especially among junior doctors (who are referred to in some countries as medical residents). Essentially, junior doctors perform two work roles, namely that of a doctor and of a trainee. Although both roles are not entirely incompatible, an inherent tension exists between them. For instance, their role as trainee requires that junior doctors learn from their work. This will generally cost

extra time that might interfere with efficient patient care that they are expected to deliver as a doctor. At any rate, resources that are spent while performing one role cannot be spent while performing the other (cf. the role scarcity hypothesis; Edwards & Rothbard, 2000). Typically, workaholics make their work (in either role) more complicated than necessary. They create difficulties for their co-workers, and they refuse to delegate work (Burke, 2001; Kanai & Wakabayashi, 2001; Machlowitz, 1980). Moreover, they are characterized by orderliness, rigidity and a high need for achievement (Mudrack, 2006; Mudrack & Naughton, 2001), and by inflexibility and perfectionism (Kanai & Wakabayashi, 2001; Killinger, 2006; Porter 2001). Hence, it is likely that workaholic junior doctors are caught between their roles as doctor and trainee. They like to spend an excessive amount of time and energy in both roles, but resources spent in one role go at the expense of the other role and vice versa, thus causing an intra-role conflict at work. Compared to the literature on workaholism and inter-role conflict, studies on intra-role conflict are scarce. However, a study among Japanese automotive workers showed that role conflict was positively associated with the compulsive component of workaholism, after controlling for role ambiguity and workload (Kanai & Wakabayashi, 2001).

When the excessive amount of energy that workaholics spend at work is not counterbalanced with appropriate recovery (Sonnetag & Zijlstra, 2006) they might eventually exhaust their energy back-up, leaving them burned out. Following this line of reasoning, Maslach (1986) considered workaholism as a root cause of burnout. Indeed, the empirical support for a positive association between workaholism and burnout is both convincing and abundant (e.g. Andreassen, Ursin, & Eriksen, 2007; Burke, 2008; Burke, Richardsen, & Mortinussen, 2004; Schaufeli, Shimazu, & Taris, in press; Schaufeli, Taris, & Bakker, 2008; Taris et al., 2005). We argue that recovery from work is doomed to be inappropriate for workaholics given their atrophied non-work life and the concomitant work-home conflict. Moreover, intra-role conflicts at work further drain the workaholic's energy and might lead to burnout. This is supported by a meta-analysis that revealed a substantial association between role conflict and emotional exhaustion ($r = .53$) and depersonalization ($r = .37$), two core components of burnout (Lee & Ashforth, 1996). In sum, we predict an indirect relationship between workaholism and burnout, through (inter- and intra-) role conflicts. This assumption is also supported by an abundance of research showing a positive relationship between role conflict and work-family conflict on the one hand and burnout on the other hand (for reviews, see Lee & Ashforth, 1996; Schaufeli, 2007).

A similar process is likely to operate in the case of workaholism and well-being. Various studies have shown that workaholism is negatively related to job satisfaction (Aziz & Zickar, 2006; Bonebright et al., 2000; Buelens & Poelmans, 2004; Burke, 2001, 2008; Burke & Koskal, 2002), experienced health (Buelens & Poelmans, 2004; Burke, 2000; Schaufeli, Taris, & Bakker, 2006) and happiness or subjective well-being (Burke, 2000, 2008; Burke & Koskal, 2002; Schaufeli et al., 2006). Most likely the reason is that working excessively hard in a compulsive way causes considerable stress (including that resulting from inter- and intra-role conflict) which is incompatible with feelings of health and well-being. For instance, the classic meta-analysis of Jackson and Schuler (1985) revealed substantial negative correlations between role conflict at work and various aspects of satisfaction ($-.31 < r < -.48$) and tension/anxiety ($r = .43$).

Job demands, role conflicts and outcomes

According to all major job stress models, such as the Job Demands-Control model (Karasek & Theorell, 1990) and the Job Demands-Resources model (Bakker & Demerouti, 2007), psychological demands may lead to both chronic job strain such as burnout, and to a deterioration of positive outcomes such as health and job satisfaction. This is not only true for quantitative demands but also for qualitative demands, particularly in health care settings (see Schaufeli, 2007, for an overview). For instance, junior doctors process large quantities of information and make complicated decisions (mental demands), they work in a complex organizational environment (organizational demands) and they must deal with suffering patients and their families (emotional demands). We argue that these qualitative demands produce additional stress which makes it more difficult for junior doctors to perform well in their roles as doctor and trainee, thus aggravating intra-role conflict. At the same time these qualitative job demands are likely to spill over to the non-work domain, causing inter-role conflict. Indeed, a recent meta-analysis revealed a substantial association ($r = .48$) between job stress, resulting from psychological demands at work and work family conflict (Byron, 2005). In sum, we predict an indirect relationship (via inter-role and intra-role conflicts) between qualitative job demands on the one hand and burnout and well-being on the other hand. Since we argued that role conflicts play a similar mediating role in the case of workaholism and job demands, this implies that the impact of workaholism on negative and positive outcomes is considered to be independent from external job demands. Or put differently, our research model posits that individual behavioural tendencies (workaholism) contribute incrementally to explaining positive (well-being) and negative (burnout) outcomes beyond common indicators of job demands, such as emotional, mental and organizational demands.

Context of the present study

Junior doctors work excessively long hours. For instance, a national US-survey found that, on average, medical residents were 56.9 hours per week on call in the hospital (Daugherty, DeWitt, & Rowley, 1998). In a similar vein, depending on the year that was surveyed, between 63% and 85% of junior doctors did not take sick-leave although they suffered from illness (Perkin, Higton, & Witcomb, 2003). So an important precondition for workaholism seems to be met; junior doctors work excessive hours, even when they feel ill. Of course, the reason for working long hours may also be external and result from peer-group pressure, excessive demands from supervisors or organizational constraints (understaffing). Yet, it is generally recognized that junior doctors are particularly at-risk for workaholism (Harpaz & Snir, 2003; Scott et al., 1997). In our study we seek to demonstrate that the psychological effects of workaholism among junior doctors are independent from the demands they experience at the job.

A recent review found 15 articles that suggest that burnout levels are particularly high among junior doctors and may be associated with depression and problematic patient care (Thomas, 2004). A more comprehensive review that identified 19 studies confirms this picture and concludes that between 18% and 76% of the junior doctors suffered from severe burnout symptoms (Prins, Gazendam-Donofrio, Tubben, Van der Heijden, Van de Wiel, & Hoekstra-Weebers, 2007a). The prevalence of burnout

among Dutch junior doctors (the group under study in this article) was estimated at 13% in a preliminary study and was thus somewhat lower (Prins et al., 2007c). Nevertheless, this percentage is substantially higher than the 4% burnout cases that has been estimated using a Dutch sample of over 13,000 employees from 29 different professions (Bakker, Schaufeli, & Van Dierendonck, 2000). So taken together, there is convincing evidence that burnout is particularly prevalent among junior doctors. In our study we investigate to what extent burnout levels are uniquely related (via role conflicts) with workaholism, controlling for the effects of job demands.

Method

Sample and procedure

All 5245 Dutch junior doctors who were included in the national register of the Royal Dutch Medical Association on 1 October 2005 received a questionnaire by mail. In the Dutch system medical students follow a 6-year general training in medical school, followed by a traineeship in a particular specialized area. The length of this specialized training of junior doctors varies between 3 years (e.g. general practitioner) and 6 years (e.g. neurosurgeon). A total of 105 respondents indicated that they were no longer junior doctors. Of the remaining 5140 junior doctors, 2240 responded (43.7%), of whom 2115 completed the questionnaire and 125 indicated they did not wish to participate. The top three reasons for not responding were: "I am too busy" (23%), "The questionnaire is too long" (22%) and "I lack energy" (11%). A cover letter was included that explained the purpose of the study (a working conditions survey) and emphasized anonymity. In terms of gender, 60.7% of the participants were female; the mean age of the sample was 31.5 years ($SD = 3.5$). Almost 77% were married or lived together with a partner, and 32% of the respondents had one or more children. The five most important specialties included were: internal medicine (13.7%), psychiatry (11.4%), surgery (8.0%), paediatrics (7.6%) and anaesthesiology (7.0%).

Measures

Workaholism was measured with the 10-item DUWAS (Dutch WorkAholism Scale; Schaufeli et al., in press) that includes two scales: *Working Excessively* (5 items, $\alpha = .67$) and *Working Compulsively* (5 items, $\alpha = .77$). Example items are: "I seem to be in a hurry and racing against the clock" (working excessively) and "I feel that there's something inside me that drives me to work hard" (working compulsively). Both scales were scored on a 5-point rating scale, ranging from 1 ("never") to 5 ("always"). A confirmatory factor-analysis revealed that the hypothesized two-factor structure of the DUWAS fit well to the data ($\chi^2(34 df) = 360.46, p < .001$; GFI = .97; AGFI = .95; RMSEA = .07, NFI = .92; NNFI = .91, CFI = .93). The correlation between both latent factors was .55 ($p < .001$).

Three qualitative job demands were assessed: *Mental Demands* (4 items; $\alpha = .77$), *Organizational Demands* (5 items; $\alpha = .64$), *Emotional Demands* (4 items; $\alpha = .71$), using shortened scales (e.g. Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003) of the Questionnaire on the Experience and Evaluation of Work (QEEW). The QEEW is widely employed by applied researchers in The Netherlands (Van Veldhoven, De Jonge, Broersen, Kompier, & Meijman, 2002). Example items are: "Does your work

demand a lot of concentration?” (mental demands); “Do you have a lot of meetings?” (organizational demands); and “Does your work put you in emotionally upsetting situations?” (emotional demands).

Role conflicts were assessed with two scales measuring inter-role conflicts and intra-role conflict, respectively. *Inter-role Conflict* was operationalized by three items from the Survey Work-home Interference Nijmegen (SWING; Geurts, Taris, Kompier, Dikkers, Van Hooff, & Kinnunen, 2005; see also Demerouti, Bakker, & Bulters, 2004) ($\alpha = .71$). Participants were asked to indicate the extent to which their work negatively influences their home situation, e.g. “How often does it happen that you find it difficult to fulfil your domestic obligations because you are constantly thinking about your work?” *Intra-role Conflict* was assessed with a self-constructed, four-item scale that focuses on conflicts between the resident’s role as a doctor and as a trainee ($\alpha = .64$). An example item is: “How often does it happen that because of your training, it is difficult to fulfil the requirements as a doctor?”

Burnout was assessed with two scales of the Dutch version (Schaufeli & Van Dierendonck, 2000) of the Maslach Burnout Inventory-Human Services Survey (MBI-HSS; Maslach, Leiter, & Jackson, 1996): *Emotional Exhaustion* (8 items; $\alpha = .89$) and *Depersonalization* (5 items; $\alpha = .73$). Example items are: “I feel emotionally drained from my work” (exhaustion) and “I don’t really care what happens to some recipients” (depersonalization). All items were scored on a 7-point scale ranging from 0 (“never”) to 6 (“always”). Instead of the third dimension of the MBI-HSS (reduced personal accomplishment) *Reduced Medical Accomplishment* was assessed, using a self-constructed scale (6 items; $\alpha = .69$). An example item is “I make mistakes that have negative consequences for my patients.” The items were developed based on a previous study of errors made by junior doctors (Shanafelt, Bradley, Wipf, & Back, 2002). Items were scored on a 5-point scale ranging from 1 (“never occurs”) to 5 (“occurs often”). The reason for substituting reduced medical accomplishment for personal accomplishment as an indicator of burnout is twofold. First, medical accomplishment is a specific and hence a more appropriate measure of accomplishment in medical settings. Second, instead of a positive scale that is reversed in order to assess burnout, it appeared that reduced accomplishment is more adequately measured with a scale that consists of negatively worded items (Bresó, Salanova, & Schaufeli, 2007).

Three indicators were used for well-being. *Happiness* or subjective well-being (Diener, Suh, Lucas, & Smith, 1999) was tapped with a single item (“Taken everything together, how happy are you with your life?”) that was scored on a 10-point scale ranging from 0 (“totally unhappy”) to 10 (“extremely happy”). *Perceived Health* was also assessed with a single item (“Do you feel in good health?”) that was scored on a 4-point scale ranging from 1 (“almost never”) to 4 (“almost always”). *Job Satisfaction* was measured with a self-constructed scale of three items ($\alpha = .89$); an example item is “To what extent are you satisfied with the training you receive?” Items were scored on a 5-point scale, ranging from 1 (“not so much”) to 5 (“very much”).

Analyses

In order to reduce change capitalization, the total sample was randomly split into a model development sample (Sample 1, $N = 1058$) that was used to test the

measurement model and the research model (see Figure 1) and a model validation sample (Sample 2, $N = 1057$) in which the final model was cross-validated. Structural equation modelling methods as implemented by AMOS 5 (Arbuckle, 2003) were used to test the fit of the measurement model and the research model. Maximum likelihood estimation methods were used and the input for the analysis was the covariance matrix of the items. The goodness-of-fit of the model was evaluated using four absolute fit indices (cf. Jöreskog & Sörbom, 1986): χ^2 goodness-of-fit statistic, Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI) and the Root Mean Square Error of Approximation (RMSEA). Because χ^2 is sensitive to sample size, three relative goodness-of-fit indices were calculated (Hu & Bentler, 1999): Normed Fit Index (NFI), Non-Normed Fit Index (NNFI) and Comparative Fit Index (CFI). For these three fit-indices, as a rule of thumb, values greater than .90 are considered as indicating acceptable fit, whereas values smaller than .08 for RMSEA indicate acceptable fit.

Results

Preliminary analysis

The means, standard deviations and correlations between the study variables of Samples 1 and 2 are shown in Table 1.

First the measurement model was tested in Sample 1. The fit of the 1-factor model with all 13 study variables loading on a single latent variable was compared with that of a 5-factor model that included workaholism (working excessively and working compulsively), job demands (mental, emotional, and organizational demands), intra- and inter-role conflict, burnout (emotional exhaustion, depersonalization, reduced medical accomplishment) and well-being (job satisfaction, happiness, perceived health). The 5-factor model fitted well to the data ($\chi^2(55 \text{ df}) = 307.04$, $p < .001$, GFI = .96; AGFI = .93; RMSEA = .07; NFI = .93; NNFI = .91; CFI = .94), and its fit was superior to that of the 1-factor model. ($\Delta\chi^2(10 \text{ df}) = 274.77$; $p < .001$). Factor loadings were all significant, ranging from .35 to .91. So it is concluded that instead of loading on a single factor the study variables load, as expected, on the five latent variables that have been specified in our model.

Testing of the research model

The research model as shown in Figure 1 was a successful fit to the data of Sample 1: $\chi^2(59 \text{ df}) = 311.75$; $p < .001$; GFI = .95; AGFI = .93; RMSEA = .06; NFI = .92; NNFI = .92; CFI = .94. All structural paths between the latent factors were significant and in the expected direction. In a similar vein, the correlations between workaholism and job demands (positive), and between burnout and well-being (negative) behaved as expected. Next, in order to test for partial mediation, the four direct paths from workaholism/job demands to burnout/well-being were included in the model separately. It appeared that all direct path coefficients were non-significant: workaholism \rightarrow burnout $\beta = .10$, n.s.; workaholism \rightarrow well-being $\beta = -.04$, n.s.; job demands \rightarrow burnout $\beta = .23$, n.s.; job demands \rightarrow well-being $\beta = -.13$, n.s. Subsequent Sobel tests supported the mediating role of role conflicts in the relationship between workaholism and burnout ($z = 4.92$; $p < .001$) and

Table 1. The means (*M*), standard deviations (*SD*) and Pearson's Product Moment correlations (*PM*) of the study variables for Sample 1 (model development sample, below the diagonal) and Sample 2 (model evaluation sample, above the diagonal).

	Sample 1 (<i>N</i> = 1058)		Sample 2 (<i>N</i> = 1057)		PM correlations												
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Working excessively	2.67	.45	2.66	.44	1.0	.44	.32	.31	.27	.43	.38	.42	.17	.28	-.14	-.22	-.20
2 Working compulsively	2.00	.60	1.96	.58	.48	1.0	.30	.25	.27	.45	.39	.50	.34	.24	-.22	-.31	-.24
3 Emotional demands	2.45	.57	2.47	.57	.29	.27	1.0	.28	.36	.38	.40	.43	.31	.30	-.18	-.22	-.28
4 Mental demands	4.01	.59	3.99	.58	.27	.18	.28	1.0	.18	.23	.21	.22	.10	.13	-.06	-.09	-.08
5 Organizational demands	2.81	.67	2.85	.66	.35	.31	.31	.15	1.0	.36	.44	.35	.19	.20	-.23	-.23	-.30
6 Inter – role conflict	2.30	.70	2.26	.69	.52	.49	.36	.20	.38	1.0	.55	.52	.29	.20	-.29	-.40	-.33
7 Intra – role conflict	2.08	.55	2.06	.56	.41	.36	.35	.19	.40	.51	1.0	.47	.30	.27	-.22	-.31	-.32
8 Emotional exhaustion	2.02	1.06	1.96	1.04	.48	.50	.42	.23	.38	.57	.47	1.0	.49	.37	-.34	-.50	-.45
9 Depersonalization	1.45	.89	1.40	.87	.26	.33	.34	.13	.24	.33	.31	.56	1.0	.41	-.15	-.25	-.26
10 Reduced medical accomplishment	2.16	.56	2.17	.54	.28	.21	.26	.12	.22	.24	.35	.42	.43	1.0	-.07	-.16	-.20
11 Perceived health	3.41	.62	3.41	.62	-.16	-.24	-.17	-.05	-.17	-.25	-.19	-.37	-.19	-.12	1.0	.38	.22
12 Happiness	7.69	1.08	7.71	1.01	-.26	-.33	-.26	-.07	-.20	-.41	-.25	-.52	-.34	-.18	.37	1.0	.39
13 Job satisfaction	3.32	.92	3.33	.90	-.29	-.27	-.27	-.03	-.30	-.31	-.29	-.49	-.33	-.31	.23	.38	1.0

Note: All correlations > .06; *p* < .05.

well-being ($z = -2.98$; $p < .01$); and supported the mediating role of role conflicts in the relationship between job demands and burnout ($z = 3.45$; $p < .01$) and well-being ($z = -2.53$; $p < .05$). Hence, it is concluded that, as expected, role conflicts fully mediate the relationships between workaholism and job demands on the one hand and burnout and well-being on the other hand.

Cross-validation of the research model

In a next step, the original research model that successfully fitted to the data of Sample 1 was cross-validated using the fresh Sample 2. The model also fitted well to the data of Sample 2: $\chi^2(59 \text{ df}) = 346.92$; $p < .001$; GFI = .95; AGFI = .92; RMSEA = .07; NFI = .91; NNFI = .92; CFI = .92. Again subsequent Sobel tests supported the mediating role of role conflicts in the relationship between workaholism and burnout ($z = 2.22$; $p < .05$) and well-being ($z = -3.80$; $p < .001$) and in the relationship between job demands and burnout ($z = 3.21$; $p < .01$) and well-being ($z = -3.49$; $p < .001$). Hence, the cross-validation of the model in an independent sample was successful.

Finally, in order to assess the invariance of the research model across both samples a model was simultaneously tested to the data of Sample 1 and Sample 2 in which all structural paths (and both correlations) were constrained to be equal across both samples. The fit of the resulting constrained multi-group model ($\chi^2(124 \text{ df}) = 663.47$; $p < .001$; GFI = .95; AGFI = .93; RMSEA = .05; NFI = .92; NNFI = .91; CFI = .93) was compared to that of the freely estimated model ($\chi^2(118 \text{ df}) = 658.67$; $p < .001$; GFI = .95; AGFI = .93; RMSEA = .05; NFI = .92; NNFI = .91; CFI = .93). Compared with the constraint model, the fit of the freely estimated model did *not* deteriorate significantly ($\Delta\chi^2(6 \text{ df}) = 4.82$; n.s.). This means that invariance of the research model was demonstrated; the path coefficients and correlations did not differ significantly across both samples.

Figure 2 shows the final path model with the structural paths. As can be seen, the impact of workaholism on role conflicts was of the same magnitude as that of job demands; the same is true for the impact of role conflicts on burnout and well-being, respectively. The model explains 64% (61%) of the variance of burnout and 50% (51%) of the variance of well-being in Sample 1 (Sample 2) respectively.

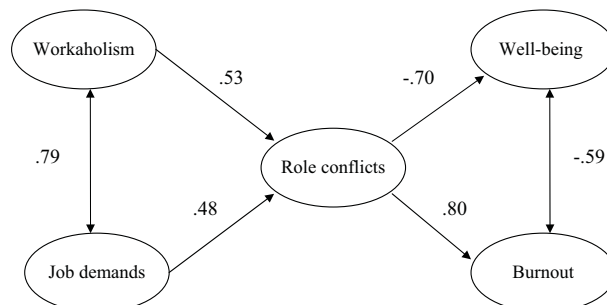


Figure 2. Standardized path coefficients (multi-group constrained model).

Discussion

We set out to test a process model that assumed that both workaholism and job demands have an indirect impact (via inter-role and intra-role conflicts) on negative (burnout) as well as positive (well-being) outcomes. The model that is depicted in Figure 1 was successfully tested and cross-validated in a large national sample of Dutch junior doctors. This group was selected because junior doctors have been considered a group at-risk for workaholism (Harpaz & Snir, 2003; Scott et al., 1997), because they experience an inherent conflict between their role as a doctor and a trainee, and because their levels of burnout are relatively high (Thomas, 2004). To the best of our knowledge this is the first study that specifically focuses on workaholism among junior doctors.

The results obtained in the current study add to the literature in at least six ways. First, our model suggests that workaholism contributes incrementally to explaining burnout and well-being beyond emotional, mental and organizational demands. Or put differently, workaholism seems to act as an individual risk-factor that contributes, independently from the job context, to burnout and well-being. The effects of workaholism and job demands on role-problems are of similar magnitude. Obviously, being driven by a strong inner need to work excessively is associated with burnout and poor wellbeing, independently from the experienced job demands. This agrees with studies both on the Type A behavioural pattern and on overcommitment as conceptualized in the Effort-Reward Imbalance model (Siegrist, 1998). For instance, Day and Jreige (2002) showed in a Canadian sample that Type A behavioural pattern, which is characterized by achievement striving and impatience-irritability, was positively related to perceived stress and negatively related to job satisfaction, after controlling for various job stressors, such as overload and conflict. Furthermore, Tsutsumi, Kayaya, Theorell, and Siegrist (2001) showed in a Japanese sample of employees who were threatened by job loss, that overcommitment (i.e. an excessive striving in combination with a strong desire of being approved and esteemed) was strongly related to depression, independently from an imbalance between occupational efforts and rewards. It seems that workaholism, Type A behavioural pattern and overcommitment have a strong inner drive in common, and it is perhaps this drive that constitutes a risk-factor that threatens occupational health and well-being.

Second, inter- and intra-role conflicts fully mediate the relationships between workaholism and job demands on the one hand, and burnout and well-being at the other hand. Model tests for partial mediation were unsuccessful and subsequent Sobel tests yielded significant results so that we may conclude that role conflicts indeed play a pivotal role. It remains to be seen whether or not this result may be generalized beyond the group under study because role conflicts are particularly salient for junior doctors. Not only do they (almost by definition) experience inter-role conflicts between their roles as doctor and trainee, but many junior doctors are also in the process of building a family, which aggravates work-to-family conflict. However, our study suggests that in addition to crossover, the inter-individual transmission of stress or strain from the job incumbent to his/her spouse (Bakker et al., 2009), workaholism is also related to spillover, the intra-individual transmission of stress or strain from one domain (work) to another domain (home and family).

Third, virtually all studies on workaholism and burnout are correlational in nature; that is, the components of burnout are regressed on those of workaholism (e.g. Burke, 2008; Burke et al., 2004; Schaufeli, Taris, & Bakker, 2008). We went one step further by testing a process model that assumes a mediating role of role conflicts. A notable exception is the study of Taris et al. (2005) who also tested a process model but did not include burnout but only one of its components (i.e. exhaustion). They found that quantitative job demands (work overload) partially mediated the relationship between workaholism and exhaustion. Hence, it seems that instead of a direct relationship, workaholism and burnout (exhaustion) are indirectly related.

Fourth, following the call for positive psychology that also resonates in the field of organizational behaviour (Bakker & Schaufeli, 2008; Luthans & Youssef, 2007), we not only included negative outcomes (burnout), but also positive outcomes (well-being). Although it appeared already from the measurement model that the five latent variables that are included in our model cannot be collapsed into one general factor, we carried out a subsequent test to assess the discriminate validity of burnout and well-being. It appeared that the fit of the two-factor model was superior to that of the one-factor model ($\Delta\chi^2(1\text{ df}) = 28.86; p < .001$). Hence, positive and negative outcomes should not be collapsed into one overall factor. Yet, Figure 2 shows that our model is rather symmetrical in the sense that the relationship of role problems with burnout is comparable in strength with the relationship with well-being.

Fifth, many scholars differentiate between “good” and “bad” forms of workaholism. For instance, Machlowitz (1980) distinguishes between “fulfilled” and “unfulfilled” workaholics, Scott et al. (1997) consider achievement-oriented workaholics as “hyper performers” and Buelens and Poelmans (2004) write about some workaholics as “happy hard workers.” Moreover, the most popular model of workaholism assumes three underlying dimensions (the so-called workaholic-triad) consisting of work involvement, drive and work enjoyment (Spence & Robbins, 1992). Different combinations of these three dimensions are assumed to produce different workaholic types. For instance, “real workaholics” are high in involvement, high in drive and low in enjoyment, whereas “work enthusiasts” are high in involvement and enjoyment and low in drive. In contrast, we agree with Mudrack (2006, p. 109), who concluded after reviewing various definitions of workaholism: “. . . work enjoyment, whether it is high or low, is simply not a defining characteristic of workaholism.” Those who have been identified as “good” workaholics strongly resemble engaged workers, as is explained in greater detail elsewhere (Schaufeli et al., 2006). Moreover, recent studies in The Netherlands (Schaufeli, Taris, & Van Rhenen, 2008) and Japan (Schaufeli et al., in press) attested to the discriminant validity of workaholism and work engagement. The results of the current study confirm that workaholism (conceptualized as an irresistible inner drive to work excessively hard) is *negatively* related to various positive indicators, notably job satisfaction and happiness. This contradicts the notion of “good” workaholism.

Sixth, our results indicate that workaholism and perceived job demands are strongly related. We did not assume a causal direction because it might work both ways. On the one hand, workaholics are known to make their work more complicated than necessary, to create more work than they actually have and not to delegate their work (e.g. Machlowitz, 1980); to some extent they create their own (high) job demands. On the other hand, high work demands may prompt workaholic behaviour, especially among those with a particular “workaholic” predisposition characterized

by dominance, high need for achievement, super ego (i.e. being guided by conscience) and perfectionism (Mudrack, 2006). Because of this bidirectional nature, the strong correlation between job demands and workaholism is not unexpected.

Given these six contributions to the literature, we may conclude that the current study contributes to our understanding of the nature of workaholism, at least as far as junior doctors are concerned. We can have particular confidence in the obtained results because the research model was not only successfully tested but also cross-validated in an independent sample. Hence, it is not likely that our findings have been influenced by chance capitalization.

Limitations and directions for future research

Nevertheless, our research has some limitations. All data are based on self reports, meaning that the magnitudes of the effects that we reported may have been biased due to common method variance or the wish to answer consistently (Conway, 2002). Unfortunately, we cannot test the strength of this type of variance directly. However, we assessed the fit of the measurement model, relative to that of a model that assumed that all study variables would load on one single factor that may be interpreted as a common method factor. It appeared that the fit of the latter was inferior to that of the measurement model that assumes five independent latent factors that corresponded with those in our research model. Moreover, recently Spector (2006) has argued that common method variance is not that troublesome as one might expect in studies such as the current one. He convincingly showed that potentially biasing variables such as social desirability, negative affectivity and acquiescence (the tendency to agree with items independent of their content) do not systematically inflate correlations between self-reported variables. Nevertheless, in order to avoid common method variance, future research on workaholism should include non-self reports as well, such as peer ratings from colleagues (Burke & Ng, 2007) or acquaintances (Aziz & Zickar, 2006; Bakker et al., 2009).

Another limitation is our rather homogeneous sample that consists of highly educated professionals, i.e. junior doctors. This might have caused restriction of range in some variables and potentially threatens the generalizability of our findings. However, the sample can also be considered a major strength of our study because the entire population was included: *all* Dutch junior doctors were invited to participate. If the results are biased, it is most likely that workaholics, being busy and tired, rather than healthy (non-workaholic) workers were under-represented in the sample. Nevertheless, future research should replicate our results in other occupational groups and show that the two-dimensional conceptualization of workaholism is (more than) the sum of its parts.

Three scales had internal consistency coefficients that were lower than the recommended criterion of .70 (Nunally & Bernstein, 1994), their α -values ranged from .64 to .67. However, this criterion of .70 is an arbitrary value that is not universally accepted. For instance, De Vellis (2003) in his handbook on scale construction, proposed .65 as a minimum threshold for an acceptable coefficient α . As an example of the arbitrariness of his criterion, Nunally (1967) mentioned that α 's ranging from .50–.60 would be acceptable, but in the second edition of his book (Nunally, 1967) he suggests a value .70 without further justification. Moreover, the minimally required degree of reliability is a function of the research purpose; for

individual-level, diagnostic research, α should be much higher than for the basic, group-level research reported in our study (Peterson, 1994).

The most important limitation, however, is the cross-sectional nature of our study that precludes cause-effect relationships being uncovered. We employed structural equation modelling analyses because it is a feasible way to examine simultaneously a set of structural associations between latent factors that are constituted by various indicators. Despite the use of arrows in Figures 1 and 2, our strategy of analysis should not be taken to suggest that we actually investigated causal relationships. So this would mean that future longitudinal research should replicate the cross-sectional findings that are reported in the current study. Clearly, a longitudinal study spanning a relatively long period of 2 years or so would be necessary because it is likely that the processes involved unfold only gradually. Workaholics do not burn out instantaneously.

Practical implications

The current study suggests that workaholism and job demands are associated (via role problems) with burnout. This means that, eventually, workaholism in combination with high job demands may lead to burnout though increased inter- and intra-role conflict. Burned-out junior doctors are exhausted, relate to their patients in a more callous and cynical way (depersonalization) and accomplish less, medically speaking. These are serious indications that patient care might suffer when junior doctors feel burned out (Thomas, 2004). Hence, it is important to prevent and combat burnout, by targeting workaholic behaviour, role problems and job demands among junior doctors in hospital settings. We will focus next on how to reduce workaholism because individual-based and organizational-based interventions to reduce burnout in health care, such as stress-management training and job-redesign, have been discussed elsewhere (Schaufeli, 2007).

Following Fassel and Schaeff (1989), supervisors should pay attention to the performance and work habits of junior doctors and be alert to early warning signs of workaholism. Instead of rewarding excess work they should try to encourage living a balanced life, for instance by doing their best to ensure that junior doctors regularly take time off work. Insecurity, self-doubt, work overload and career opportunities may make junior doctors feel compelled to put more time and effort into their work. In that case, their supervisors should try to minimize their impact on the atmosphere in the work setting. Alternatively, workaholic junior doctors could be referred to an employee assistance program or a recovery program for treatment. However, based on a survey among American employee assistance programs, Porter and Herring (2007) conclude that it is not very likely that workaholics will be referred to employee assistance programs, at least not under a referral labelled "workaholism." However, once they find their way to an employee assistance program there is some chance that their symptoms will be interpreted as possibly part of a larger workaholic pattern.

Furthermore, Haas (1991) formulated some interesting ideas on the role of supervisors that it may be possible to apply to hospital settings as well. For instance, supervisors should help junior doctors to prioritize and encourage them to delegate their work whenever possible. Also, junior doctors should be given specific times to take breaks and to leave work. Finally, supervisors should coach junior doctors in changing their harmful workaholic behaviours and cognitions as part of their

medical training. The importance of supervisory coaching is underlined by a recent study that found that many junior doctors were more dissatisfied with the emotional, appreciative and informative social support from their supervisor, compared with fellow junior doctors and nurses (Prins et al., 2007b). Supervisory coaching should also include putting into perspective the prevailing medical ethos that fosters rather than discourages workaholism. Working excessively hard is a crucial ingredient of the heroic medical ethos and it is usually perceived as synonymous with proper patient care. But when hard work results from a strong inner drive that cannot be resisted this might be detrimental for junior doctors and their patients alike.

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