Adv in Health Sci Educ (2015) 20:441–455
DOI 10.1007/s10459-014-9538-0

In the eyes of residents good supervisors need to be more than engaged physicians: the relevance of teacher work engagement in residency training

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Received: 10 March 2014 / Accepted: 24 July 2014 / Published online: 15 August 2014
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Abstract During their development into competent medical specialists, residents benefit from their attending physicians' excellence in teaching and role modelling. Work engagement increases overall job performance, but it is unknown whether this also applies to attending physicians' teaching performance and role modelling. Attending physicians in clinical teaching practice take on roles as doctors and teachers. Therefore, this study (a) examined levels of attending physicians' work engagement in both roles, and (b) quantified the relationships of both work engagement roles to their teaching performance and role model status. In this multicenter survey, residents evaluated attending physicians' teaching performance and role model status using the validated System for Evaluation of Teaching Qualities. Attending physicians self-reported their work engagement on a 7-point scale, separately for their roles as doctors and teachers, using the validated 9-item Utrecht Work Engagement Scale. In total, 549 (68 %) residents filled out 4,305 attending physician evaluations and 627 (78 %) attending physicians participated. Attending physicians reported higher work engagement in their doctor than in their teacher roles (mean difference: 0.95; 95 % CI 0.86–1.04; $p < 0.001$). Teacher work engagement was positively related to teaching performance (regression coefficient, B: 0.11; 95 % CI 0.08–0.14; $p < 0.001$), which in turn was positively associated to role model status (B:

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1.08; 95 % CI 0.10–1.18; $p < 0.001$). In the eyes of residents, good supervisors need to be more than engaged physicians, as attending physicians with high teacher work engagement were evaluated as better teachers.

Keywords Attending physicians · Medical education · Residents · Residency training · Role modelling · Supervision · Teaching performance · Work engagement · Physician roles

Introduction

Adequate supervision during residency training benefits the quality of patient care delivered by residents (van der Leeuw et al. 2012; Farnan et al. 2012). Through adequate supervision, residents are provided with sound learning conditions at the clinical workplace. In fact, when residents do not receive adequate support from their supervisors, they are at risk for increased levels of burnout (Prins et al. 2007) which is ultimately associated with reduced quality of patient care (West et al. 2009; Shirom et al. 2006; Halbesleben and Bowler 2007; Shanafelt et al. 2010; Shanafelt et al. 2002).

To asses adequate supervision of residents, attending physicians are increasingly evaluated on their teaching performance and role modelling (Steinert et al. 2006; Beckman et al. 2004; Beckman et al. 2005). Both teaching and role modelling of attending physicians are vital for learning processes of residents at the clinical workplace (Jochemsen-van der Leeuw et al. 2013; Sutkin et al. 2008a). In the process of teaching, attending physicians train residents in clinical skills; through role modelling, residents learn professional behaviours by observing and emulating the attending physicians whose styles and skills they are drawn to (Jochemsen-van der Leeuw et al. 2013; Wright 1996). High performing teachers are often seen as role model specialists (Lombarts et al. 2010) and high teaching performance affects positive role modelling (Boerebach et al. 2012a).

Previous studies identified enthusiasm about work as an attribute of both good clinical teachers and role models (Wright 1996; Sutkin et al. 2008a). Residents are able to learn better when attending physicians teach enthusiastically, arousing the interest of the resident. The relevance of attending physicians' enthusiasm about work is in line with research on work engagement, which has shown to positively affect job performance in a wide range of occupational groups (Christian et al. 2011), including physicians and teachers (Prins et al. 2009a; Bakker and Bal 2010). Work engagement is defined as a positive, work-related state of mind, involving dedication (i.e. enthusiasm), vigour (i.e. energy) and absorption (i.e. concentration) (Schaufeli et al. 2008). It may be regarded as the opposite of burnout (Gonzalez-Roma et al. 2006). This is illustrated by research showing that physicians who suffer from burnout report more medical errors (Shanafelt et al. 2010), while physicians who are highly engaged in their work report fewer errors (Prins et al. 2009b).

As residents learn patient care on the job, attending physicians train residents by making use of both clinical and teaching skills. Therefore, attending physicians in clinical teaching practice typically take roles as both doctors and teachers. Previous research indicated that attending physicians tend to be more engaged in their roles as physicians than in their roles as teachers (Berg et al. 2013). However, it is unknown how levels of attending physicians' work engagement in both roles affect their teaching performance and role modelling. Research on this subject could deliver new knowledge on whether and in which role(s) attending physicians' work engagement could be increased, in order to enhance

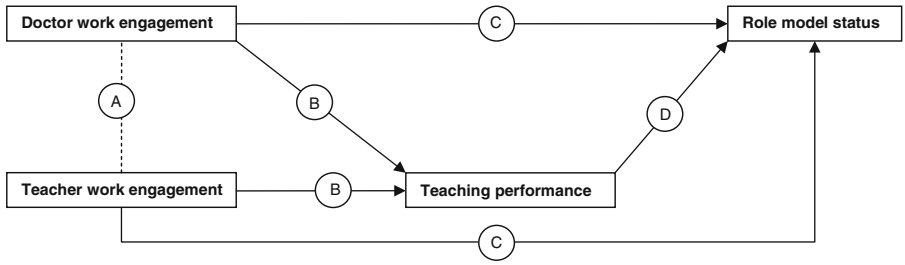

Fig. 1 Model of hypothesized relations of doctor and teacher work engagement with teaching performance and role model status

their teaching performance and role modelling. In this study, we determined levels of work engagement of attending physicians in their doctor and teacher roles (A) and analyzed the relationship of their work engagement in both roles with teaching performance (B) and role model status (C) (see Fig. 1). Given the published positive effect of teaching performance on role modelling (Boerebach et al. 2012a), we also analyzed whether attending physicians' role model status is the result of high teaching performance, the latter being affected by high work engagement (D) (see Fig. 1). Our general purpose was to gain insight into how attending physicians' doctor and teacher work engagement contribute to their teaching performance and role modelling.

Method

Study population and setting

This multicenter study involved 61 different training programs in 18 medical centers (2 academic and 16 non-academic) in the Netherlands and took place between May 2012 and January 2013. By email, we invited 819 attending physicians and 815 residents to participate in this study, while emphasizing confidentiality and voluntary participation. Residents could choose which and how many attending physicians to evaluate.

The institutional ethical review board of the Academic Medical Center of the University of Amsterdam waived ethical approval for this study.

Measures

We used data of an ongoing multicenter survey involving the System for Evaluation of Teaching Qualities (SETQ) instrument to measure teaching performance and role model status. This system is used by more than 6,000 attending physicians and residents in 40 medical centres in the Netherlands. The details of the instruments and system development are described elsewhere and show that the instruments provide reliable and valid

evaluations of attending physicians' teaching performance (Lombarts et al. 2009; Arah et al. 2011; Boerebach et al. 2012b; van der Leeuw et al. 2011).

The web-based SETQ system contains two measurement tools: one for resident-evaluation of attendings' teaching performance and another for attendings' self-evaluation. An evaluation period of approximately 1 month is announced to both attending physicians and residents, who then have the opportunity to anonymously fill out the SETQ instrument. After the evaluation period, attending physicians receive a feedback report, summarizing both residents' evaluations and attending physicians' self-evaluation of teaching performance. In both the resident- and self-evaluations, attending physicians' teaching performance was evaluated in five domains, made up of 23 items: learning climate, professional attitude towards residents, communication of learning goals, evaluation of residents and feedback. We used the residents' mean of the reported five domains to capture teaching performance. Residents reported role model status of the attending physicians with one additional item: "This attending physician is a role model to me as a future attending physician [specialist]". All items were evaluated on a 5-point-scale, ranging from "totally disagree" to "totally agree".

In the self-evaluation, attending physicians reported, in a set sequence, own demographics (such as age), own teaching performance and, lastly, their work engagement in their doctor and teacher roles. The work engagement questionnaires were optional. Work engagement was measured with the 9-item version of the Utrecht Work Engagement Scale (UWES-9) (Schaufeli and Bakker 2003). This scale was validated in several countries for multiple occupational groups, including physicians (Sepällä et al. 2009; Schaufeli and Bakker 2003). With consent from the developers, we adapted the original version of the UWES-9 into two different forms that measured work engagement of attending physicians in their roles as doctors and teachers separately. Original items were extended by the phrase "as a doctor" (for doctor work engagement) or "as a teacher" (for teacher work engagement) (see Table 2). Attending physicians self-reported their work engagement on a 7-point-scale, ranging from "never" to "always/daily". For further analysis, we used the mean (i.e. averaged over loading items) of each of the two work engagement scales for each attending physician.

Attending physicians' years of experience as a certified specialist was considered as a confounding variable, given its published association with both work engagement and job performance (Choudhry et al. 2005; Schaufeli and Bakker 2003). We calculated the years of experience from the reported year of specialist registration and the year of study measurements (2013). In addition, gender was used as a confounding variable, as research showed gender differences in teaching performance (Arah et al. 2012).

Statistical analyses

For this study, we used the resident-evaluations (and not the self-evaluations) of teaching performance as a measure for teaching performance, because research has shown that physicians have limited ability to self-assess their performance accurately (Davis et al. 2006). First, we aggregated teaching performance evaluations of different residents on the level of individual attending physicians, which resulted in average scores on teaching performance items for each attending physician. After that, we merged resident-reported data with attending physician-reported data. We calculated means for the overall as well as domain sum scores. To our knowledge, no one has validated questionnaires on work engagement in two roles. The first step in our analysis was therefore to determine whether doctor and teacher work engagement were indeed two separate constructs. To this end, we

performed a principal components analysis (PCA) with varimax rotation, and imposed a two-factor structure on all the work engagement items. In addition, we performed the PCA on the items for doctor and teacher work engagement to check the item factor loadings of the two separate scales. We then performed inter-scale and both intra- and inter-scale inter-item correlations to check, respectively, the degree to which the two work engagement scales were indeed distinct and if the scales contained a satisfying degree of specific items. To check internal consistency, we calculated Cronbach's alpha, taking a value of 0.7 or higher as acceptable.

To determine differences in the levels of doctor and teacher work engagement, we used paired t-tests to analyze the mean difference of both work engagement roles within attending physicians. Next, we used generalized estimating equations (GEE) with identity link to study the extent to which both doctor and teacher work engagement scores were associated with teaching performance and role model status. We used GEE to account for clustering by department or specialty and hospital. Hence, we used specialty and hospital as clustering variables when estimating the attending physician-averaged marginal models of the GEE. We fit two types of models, one for each outcome. First, we regressed overall teaching performance on doctor and teacher work engagement variables, adjusting for covariates and clustering. We also checked for potential interaction between doctor and teacher work engagement, by adding an interaction term (doctor work engagement* teacher work engagement) to the abovementioned models. In addition, we also fit the same models using the five teaching performance domains (namely, learning climate, professional attitude towards residents, communication of learning goals, evaluation of residents and feedback) as outcomes. Second, we regressed role model status on doctor and teacher work engagement without and then with accounting for possible mediation by teaching performance. To this end, we first looked at main effects of the variables doctor and teacher work engagement on model status, before introducing teaching performance into the model to see if it could explain some or all of the observed association between work engagement and role modelling. These analyses were adjusted for years of experience and gender.

We interpreted the associations between (doctor and teacher) work engagement, teaching performance and role model status by inspecting the magnitude and direction of the regression coefficients, as well as the associated confidence intervals and p-values. We reported the corrected quasi likelihood under independence model criterion for each model, to provide the reader with information on the goodness of fit for each model.

As residents could choose which and how many attending physicians to evaluate, the number of evaluations of teaching performance and role model status per attending physician varied. We performed sensitivity analysis that adjusted for the varying number of residents' evaluations per attending physician. Because not all participating attending physicians filled out the work engagement scales (82 % did participate), we compared the response group with the non-response group on gender, years of experience, teaching performance and number of resident-evaluations. After this, we conducted bias analysis for nonresponse by reweighting the foregoing analyses for nonresponse probability as a function of observed physician characteristics. Specifically, using logistic regression, we regressed the response variable (0 = non-response and 1 = response) on gender, years of experience and teaching performance and from that, we computed the probability of response. Then, we re-ran the models weighted by the inverse-probability-of-response and checked whether the results changed. Since the results did not substantially change (in magnitude, direction and statistical significance), we assumed that results were not sensitive to non-response bias. All analyses were performed using IBM Statistics SPSS 20.0.

Results

In total, 560 (68 %) residents filled out 4,305 evaluations of 805 attending physicians and 636 (78 %) attending physicians participated in the survey, of whom 514 (82 %) self-reported their work engagement (64 % of total invited, see Table 1). The mean number of resident evaluations per attending physician was 5.83, which meant that criteria for reliable feedback were satisfied (Arah et al. 2011; Boerebach et al. 2012a; Lombarts et al. 2009; van der Leeuw et al. 2011). Attending physicians were equally distributed across academic and non-academic medical centres (N = 319 versus N = 317, respectively) (see Table 1). On average, attending physicians had 12.9 years of experience as certified specialists.

From the principal components analysis, two factors emerged: one factor comprised all the doctor work engagement items and the other factor included all the teacher work engagement items (see Table 2). The inter-scale correlation was moderate (Pearson's correlation coefficient: r = 0.48). Furthermore, Cronbach's alpha for internal consistency of both scales were higher than 0.90 (Table 2). Attending physicians reported higher doctor work engagement than teacher work engagement: mean difference = 0.95, 95 % CI 0.86–1.04; $p < 0.001$.

We found no associations between doctor work engagement and teaching performance, or with its specific domains. Conversely, teacher work engagement was consistently positively related to overall teaching performance and its specific domains (learning climate, professional attitude, communication of learning goals, feedback and evaluation) (Table 3). The size of the unstandardized regression coefficients varied little, with the biggest coefficient seen for communication of learning goals. We found no interaction between doctor and teacher work engagement.

Finally, we found that teacher work engagement was positively associated with role model status, while doctor work engagement was not (Table 4, Model 1). Adding teaching performance as mediator to the above model explained away this relationship (Table 4, Model 3), indicating that teaching performance clarified most of the relationship between teacher work engagement and role model status.

Table 1 Descriptive statistics of the sample

		N
Setting	Medical centers (academic/non-academic)	18 (2/16)
	Residency programs	61
Participants	Residents participated (% of total invited)	560 (68 %)
	Attending physicians participated (% of total invited)	636 (78 %)
	Female attending physicians (% females)	252 (41 %)
	Academic/non-academic attending physicians (% academic)	317/319 (50 %)
	Mean attending physicians' age (SD)	48.01 (11.07)
Response	Resident evaluations	4,368
	Attending physicians evaluated by residents	805
	Mean resident evaluations per attending physician (SD)	5.43 (2.81)
	Number of attending physicians' who self-reported work engagement (% participated/ % of total invited)	514 (82 %/64 %)

Table 2 Means, SD, items' factor loadings and inter-scale/item correlations of the Utrecht Work Engagement Scale in doctor and teacher roles

	Mean	SD	Cronbach's alpha	Factor loadings (loadings[a])	Inter-scale/item correlations Teacher work engagement
Doctor work engagement	4.54	0.86	0.91		0.48
I am enthusiastic about my work *as doctor*				0.82 (0.83)	0.35
My work *as doctor* inspires me				0.82 (0.78)	0.38
I am proud of the work that I do *as doctor*				0.75 (0.83)	0.39
I feel happy when I am working intensely *as doctor*				0.82 (0.84)	0.40
I am immersed in my work *as doctor*				0.75 (0.84)	0.34
I get carried away when I'm working *as doctor*				0.60 (0.83)	0.67
In my work *as doctor,* I feel bursting with energy				0.78 (0.77)	0.45
In my work *as doctor*, I feel strong and vigorous				0.75 (0.76)	0.49
When I get up in the morning, I feel like going to work *as doctor*				0.83 (0.63)	0.30
Teacher work engagement	3.59	1.13	0.95		
I am enthusiastic about my work *as teacher*				0.86 (0.84)	
My work *as teacher* inspires me				0.84 (0.81)	
I am proud of the work that I do *as teacher*				0.81 (0.86)	
I feel happy when I am working intensely *as teacher*				0.79 (0.85)	
I am immersed in my work *as teacher*				0.84 (0.87)	
I get carried away when I'm working *as teacher*				0.70 (0.89)	
In my work *as teacher,* I feel bursting with energy				0.87 (0.87)	
In my work *as teacher*, I feel strong and vigorous				0.79 (0.74)	
When I get up in the morning, I feel like going to work *as teacher*				0.75 (0.83)	
Teaching performance	3.85	0.42			
Learning climate	3.90	0.47			
Attitude towards residents	4.28	0.48			
Communication of learning goals	3.45	0.59			
Feedback	3.79	0.47			

Table 2 continued

	Mean	SD	Cronbach's alpha	Factor loadings (loadings[a])	Inter-scale/item correlations Teacher work engagement
Evaluation	3.94	0.49			
Role model status	3.85	0.60			

[a] Factor loadings when doctor work engagement is analyzed as a scale distinct from the teacher work engagement and vice versa

Table 3 Unstandardized regression coefficients (B's) and 95 % confidence intervals of associations of doctor and teacher work engagement with teaching performance and its' subscales

	B (95 % CI)	*P* value
Teaching performance		
Doctor work engagement	−0.03 (−0.07–0.01)	0.186
Teacher work engagement	0.11 (0.08–0.14)	<0.001
QICC[a]	81.264	
Learning climate		
Doctor work engagement	−0.03 (−0.08–0.02)	0.185
Teacher work engagement	0.11 (0.08–0.15)	<0.001
QICC[a]	108.946	
Attitude towards residents		
Doctor work engagement	0.01 (−0.05–0.06)	0.818
Teacher work engagement	0.05 (0.01–0.10)	0.022
QICC[a]	88.394	
Communication of learning goals		
Doctor work engagement	−0.05 (−0.12–0.02)	0.193
Teacher work engagement	0.15 (0.10–0.20)	<0.001
QICC[a]	153.889	
Feedback		
Doctor work engagement	−0.04 (−0.09–0.01)	0.164
Teacher work engagement	0.12 (0.08–0.16)	<0.001
QICC[a]	111.386	
Evaluation of residents		
Doctor work engagement	−0.04 (−0.09–0.00)	0.071
Teacher work engagement	0.11 (0.07–0.16)	<0.001
QICC[a]	113.688	

Each model is controlled for years of experience as certified consultant and gender

[a] QICC = Corrected Quasi Likelihood under Independence Model Criterion: information criterion in smaller-is-better form; that is, the model with the smallest QICC has the best goodness of fit

Table 4 Unstandardized regression coefficients (B's) and 95 % confidence intervals of associations work engagement (doctor and teacher) and teaching performance with role model status

	Role model status	
	B (95 % CI)	*P* value
Model 1		
Doctor work engagement	0.02 (−0.05–0.09)	0.554
Teacher work engagement	0.07 (0.02–0.12)	0.008
QICC[a]	164.515	
Model 2		
Doctor work engagement	Not applicable	
Teacher work engagement	Not applicable	
Teaching performance	1.05 (0.95–1.14)	<0.001
QICC[a]	87.251	
Model 3		
Doctor work engagement	not applicable	
Teacher work engagement	−0.03 (−0.07–0.01)	0.116
Teaching performance	1.08 (0.10–1.18)	<0.001
QICC[a]	75.857	

Each model is controlled for years of experience as certified attending physician and gender

[a] QICC = Corrected Quasi Likelihood under Independence Model Criterion: information criterion in smaller-is-better form; that is, the model with the smallest QICC has the best goodness of fit

The foregoing results did not change materially after further accounting for the varying number of resident evaluations per attending physician. Although we found small differences between the response group and the non-response group on gender, years of experience and teaching performance (see Appendix, Table 5) the findings were robust following sensitivity analysis for non-response (selection) bias. This was to be expected since all models were statistically controlled for those variables.

Discussion

Main findings

In determining levels of attending physicians' doctor and teacher work engagement, this study found that attending physicians were more engaged with their doctor work than with their teacher work. Those who reported higher levels of teacher work engagement were consistently evaluated as better teachers. Subsequently, attending physicians with higher levels of teaching performance were more likely to be perceived as specialist role-models by residents.

Explanation of findings

This study showed that attending physicians experience a different level of engagement with their doctor work than with their teacher work. That is, attending physicians appear more engaged with their doctor work, consistent with previous research on this topic (Berg et al. 2013). In clinical practice, attending physicians spend most of their time in patient care, which possibly undermines the time available for teaching in clinical practice (Kumar et al. 2011). Teaching could be harder to be engaged for when working under the time pressures of clinical practice. Indeed, research in other occupations showed that time pressure can result in lower levels of work engagement (Schaufeli et al. 2009; Schaufeli and Bakker 2004).

Our results did not identify an association of doctor work engagement with teaching performance. This indicates that attending physicians who are engaged doctors, are not necessarily perceived as good supervisors. In fact, this study suggested that attending physicians are better evaluated on their teaching performance when they are engaged for teaching. Others have found that enthusiasm, commitment and positive attitudes towards teaching were indeed characteristics of effective teachers (White and Anderson 1995; Paukert and Richards 2000; Gjerde and Coble 1982).

Previous research indicated that positive role models are dedicated to patient care (Elzubeir and Rizk 2001) and enjoy teaching (Wright et al. 1998). Surprisingly, this study showed that highly engaged attending physicians, either in their work as doctors or as teachers, are not necessarily viewed as better role models by residents. Perhaps this can be clarified by the complex process involved in role modelling, in which residents observe and emulate attending physicians whose skills and styles they are drawn to (Wright 1996). This way, residents' perceptions of role models could also be guided by their personal preferences and learning needs. For example, residents who want to become good communicators might especially perceive excellent physician communicators as positive role models. Therefore, role modelling might be a concept prone to variability and subjectivity, which could make it hard to predict with specific factors such as doctor or teacher work engagement. In addition, role modelling was measured as an overall concept using a single

item. Possibly, only specific role model types (e.g. role model as a person, teacher or physician) (Boerebach et al. 2012a, b) can be clarified by specific forms of work engagement. Future research could examine doctor and teacher work engagement in relation to a more extensive and discriminative measure of role modelling.

Engaged teachers were evaluated as better supervisors, i.e. in the eyes of residents they deserved higher levels of teaching performance. High scorers on teaching performance were ultimately perceived as better role models. Indeed, previous research showed that teaching performance is of significant importance for positive role modelling of attending physicians (Boerebach et al. 2012a, b; Wright et al. 1998). Still, many other characteristics are essential for high teaching performance and positive role modelling (Sutkin et al. 2008b; Jochemsen-van der Leeuw et al. 2013). This study gave insight on the specific role of doctor and teacher work engagement for teaching performance, as well as its subdomains, and role model status.

Limitations

Although the study sample was large with physicians from 18 medical centres in the Netherlands, this study and its findings need not be applicable to every Western health system. The distribution of academic and non-academic medical centres (2/16) was unequal, yet the number of attending physicians working in academic versus non-academic medical centres was equally distributed (see Methods). In addition, not all (82 %) participating attending physicians actually self-reported their work engagement; however, we found that results were not sensitive for selection probability.

Although work engagement of attending physicians in their doctor and teacher roles have been researched before (Berg et al. 2013), this was the first study that validated questionnaires on work engagement in these roles, instead of measuring work engagement as an overall work-related state of mind (Sepällä et al. 2009). The statistical analyses indicated that this indeed is a valid approach (see Results). That is, attending physicians appear to discriminate between doctor and teacher work engagement.

The survey in this study found possible relations between attending physicians' work engagement and the level of teaching performance; yet, it does not guarantee causality. Reverse causation, however, would not be that likely as previous research indicated that work engagement causally determines performance instead of the other way around (Xanthopoulou et al. 2009; Bakker and Bal 2010). Improved temporal ordering of the work engagement and teaching performance and role model status evaluations as in long-term longitudinal research will be helpful in the future. Since we cannot rule out the potential for the order of administering the two forms of work engagement to impact the results, caution should be exercised in interpreting our findings.

This study showed that residents evaluate attending physicians as better supervisors when being engaged for teaching. However, this does not necessarily imply that engaged teaching also leads to better learner outcomes that are ultimately crucial for the clinical performance of residents. Learner outcomes are thought to be facilitated by high teaching performance. Therefore, it would be interesting to study the mediating role of teaching performance in the relationship between attending physicians' work engagement and residents' learner outcomes (work engagement → teaching performance → residents' learner outcomes).

Implications

Attending physicians with high levels of teacher work engagement were ultimately evaluated as better teachers. Assuming causal relations, increasing teacher work engagement could lead to enhanced teaching performance of attending physicians, which could benefit the quality of patient care delivered by residents (Farnan et al. 2012).

Paying attention to teaching in medical education only may not be enough to get all attending physicians engaged for teaching. Research showed that work engagement is predicted by working conditions (Hakanen et al. 2008; Schaufeli et al. 2009): job demands—characteristics of work that evoke strain (e.g. time pressure and colleague conflict), and job resources—aspects of work that stimulate personal growth, learning and development (e.g. performance feedback or job autonomy). Effects of job demands and resources have been established for many professions (Schaufeli and Bakker 2004; Hakanen et al. 2005), including physicians (Mauno et al. 2007). However, the specific job demands and resources have not been sorted out for attending physicians in clinical teaching practice. Since teacher work engagement is of particular interest because of its relation to teaching performance, future research could identify job demands and resources affecting attending physicians' teacher work engagement. For example, these job resources could include increased clinical knowledge and professional growth, as these factors are related to enjoyment in teaching (Stone et al. 2002). Hospitals and departments could use empirically retrieved insights on this matter, to adjust the demands and resources to a more desirable teaching work environment for attending physicians. As job resources predict work engagement more than job demands do (Hakanen et al. 2005), focusing on job resources is more cost-effective.

Conclusion

In the eyes of residents, good supervisors need to be more than engaged physicians. Residents perceive attending physicians who are more engaged for teaching as better supervisors, who are in turn more positively perceived as role models. Yet, attending physicians feel less engaged for their teacher work than for their doctor work. This leaves room for increasing teacher work engagement, which could be facilitated by identifying and improving job demands and resources that contribute to work engagement for attending physicians in clinical teaching.

Acknowledgments We thank all residents and attending physicians who participated in this study. We thank Medox for designing and maintaining the web application used for the System of Evaluating Teaching Qualities (SETQ). We thank our colleagues of the Professional Performance research group and the members of the Journal Club for their stimulating feedback on this study. This study is part of the research project Quality of Clinical Teachers and Residency Training Programs, which is co-financed by the Dutch Ministry of Health, the Academic Medical Center of Amsterdam, and the Faculty of Health and Life Sciences of the University of Maastricht. Funders had no role in design and conduct of the study; collection, management, analysis, and interpretation of the data; and preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Appendix

See Table 5.

Table 5 Descriptive statistics of years of experience, teaching performance, role model status, number of resident-evaluations and gender, separately for responders and non-responders on the work engagement questionnaires

	Responders	Non-responders
Mean (SD) years of experience	12.34 (8.62)	13.96 (8.78)
Mean (SD) teaching performance	3.90 (0.40)	3.77 (0.41)
Mean (SD) role model status	3.90 (0.55)	3.81 (0.55)
Mean (SD) number of resident evaluations	5.99 (2.72)	5.79 (2.27)
Number of female attending physicians (% females)	212 (41 %)	40 (33 %)

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