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RELATING TEACHING QUALIFICATIONS AND BASIC NEED SATISFACTION IN MEDICAL TEACHING

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ABSTRACT

Introduction: Teaching Qualifications (TQs) have been implemented in University Medical Centers, but their relation to teachers' motivation for medical teaching is unknown. Because teacher motivation influences important outcomes, it is crucial to study how TQs are related to promoting teacher motivation, by fulfilling the basic needs of feeling autonomous, competent, and related towards medical teaching.

Aims: To explore relations between TQs and feelings of autonomy, competence, and relatedness towards medical teaching.

Methods: An online questionnaire was used to collect data about teaching at a university hospital. We measured feelings of autonomy, competence, and relatedness towards medical teaching using the Teaching-related Basic Need Satisfaction scale (T-BNS). We applied multivariate regression analysis to examine relations between TQs and basic need satisfaction in teaching.

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Results: A total of 767 medical teachers participated. TQs appear to be related to feeling competent in teaching. Higher TQ levels are not related to higher feelings of autonomy, competence, and relatedness towards medical teaching.

Conclusion: The results imply that appealing to non-qualified teachers' feelings of competence towards medical teaching may stir up their enthusiasm for TQ policy. They also call for robust teaching positions to build teaching experience, preferably as early as possible, and for assessing the importance applicants attach to education in job interviews.

INTRODUCTION

University Teaching Qualification in the Netherlands

As a form of quality assessment, several countries (e.g., Australia, the Netherlands, England, and South-Africa) have developed a framework for formal Teaching Qualifications (TQs) in higher education (De Jong, 2013; Quality Assurance Agency for Higher Education, 2008, 2011; Ensor, 2003; Hardy & Smith, 2006; Stewart, 2014). In 2008, all research universities in the Netherlands signed the Mutual Agreement of University Teaching Qualification, stating that a University Teaching Qualification (UTQ) is compulsory for all teaching staff (VSNU, 2008). The UTQ is mutually recognized between research universities but is not mandatory by law. Based on the generic national framework of UTQ criteria, each faculty has developed its own framework of criteria, in line with its specific teaching requirements, and has embedded its own UTQ certification procedures (De Jong, 2013; VSNU, 2008). In the Netherlands, all University Medical Centers (UMCs)¹ have also elaborated on the UTQ framework (Molenaar et al., 2009), but research on the effects of UTQs is still in its infancy (Jong, 2011).

Measuring effects of Teaching Qualifications in Medical Education

TQs in medical education are implemented to improve teaching quality by training better teachers, with the ultimate goal of improving student learning. It is difficult, however, to measure the direct impact of TQs on teacher quality, or effects of teacher performance on student performance, because these relations are complicated and versatile (Butcher, 2012; Gibbs & Coffey, 2004; Hanbury, 2008; Nkoni, 2014; Parsons, 2013; Stewart, 2013). We need a better understanding, therefore, of parts of these complex relations, also to contribute to the international discourse on the impact of UTQs, and to stimulate further research on this topic.

As far as we know, there are no studies relating TQs to teachers' motivation for teaching. Teacher motivation is important because it is likely to have consequences for both teachers and students (Richardson, 2010), as higher teacher motivation is related to beneficial outcomes such as better teacher performance, well-being, and job satisfaction and better student performance and motivation (Levesque, Blais, & Hess, 2004; Pelletier, Seguin-

¹ All Dutch universities with a university hospital have established a University Medical Center (UMC): a university hospital with medical research and teaching tasks.

Levesque, & Legault, 2002; Schaufeli & Bakker, 2004; Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008).

In recent teacher motivation research, the social-contextual support of teachers has been left underexposed (Richardson, 2010). This is striking because the effects of organizational development initiatives like UTQs on individual teachers are mediated by the social context of the department and the organization (Mathieson, 2011). When studying the impact of UTQs in medical education in terms of motivation, therefore, the social context of medical teachers should be taken into account.

Self-Determination Theory and Social Context

The notion of taking the social context into account fits in well with the Self-Determination Theory (SDT) as SDT relates motivation to social-contextual influences. This theory explains motivation for medical teaching on the basis of motivational quality, distinguishing between controlled and more self-determined forms of motivation (Deci & Ryan, 2012; Kusurkar, Ten Cate, van Asperen, & Croiset, 2011; Ten Cate, Kusurkar, & Williams, 2011). According to SDT, social-contextual factors may stimulate or hinder the development of motivation for a particular activity – like medical teaching – by facilitating the satisfaction of the basic psychological needs for autonomy, competence, and relatedness. Social-contextual factors that facilitate satisfaction of someone's feelings of autonomy, competence, and relatedness are important for personal well-being and psychological growth, and for the development of interest in particular activities and more autonomous forms of motivation (Deci & Ryan, 2008; Krapp, 2005).

In short: motivation for medical teaching in terms of teachers' feelings of autonomy, competence, and relatedness towards medical teaching influences important outcomes. TQs, implemented in teachers' immediate social context of their departments, could enhance their motivation for medical teaching by satisfying their basic psychological needs. We need to gain an understanding, therefore, of how TQs are related to teachers' feelings of autonomy, competence, and relatedness to medical teaching. With this knowledge, we can suggest adjustments on TQ policy, so it can make a positive contribution to teachers' motivation for medical teaching. New insights into teachers' motivation could also stimulate the discussion on the impact of TQs. The main research question in this study is: to what extent are TQs related to motivation in terms of feelings of autonomy, competence, and relatedness in medical teaching? In this study, we explored the case of the Radboud University Medical Center (RUMC). The system of Teaching Qualifications at the RUMC is outlined in Box 1.

Box 1. The System of Teaching Qualifications at the Radboud University Medical Center

In 2006, the RUMC implemented a system of TQs, based on the Dutch national UTQ framework, but specifically focusing on the (clinical) setting of medical education. The system of TQs at the RUMC has four qualification levels: Start Teaching Qualification (STQ), Basic Teaching Qualification (BTQ), Extended Teaching Qualification (ETQ), and Full Teaching Qualification (FTQ) (Engbers et al. 2013).

Teaching competencies for all qualification levels were defined and approved by both clinical and non-clinical stakeholders.

The required TQs have been defined for all educational positions at the RUMC. While being coached by a trained peer, all teachers must obtain a TQ by constructing an educational portfolio. All portfolios are assessed by an Assessment Committee appointed by the Dean of the RUMC, and must document:

- Teaching qualities: designing, delivering, coordinating, and assessing modules, clinical education, and research internships. Evidence could be peer review, student feedback, or developed materials;
- Professional qualities (personal development, self-reflection);
- Written reflection on all evidence of teaching competency, and on the completed qualification program.

The STQ can be obtained through a compulsory course on student learning principles, the structure of the Nijmegen curricula, and the educational philosophy behind them. No further educational portfolio has to be constructed for the STQ. TQs are cumulative, so obtaining the SQT first is required before obtaining the BTQ, and so on. The BTQ is required for tenure and is required, for example, to be appointed as Associate Professor or Professor with a research appointment. The ETQ is required to be appointed as Associate Professor or Professor with an education appointment. The FTQ is formally not required for any educational position, but it is certainly considered in appointments in higher educational positions. This way, TQs help to structure medical teaching careers. Heads of Department may also independently choose to attach a higher pay scale to obtaining a TQ.

Supposed Relations between Teaching Qualifications and Feelings of Autonomy, Competence, and Relatedness in Medical Teaching

We hypothesized that TQs are positively related to teachers' feelings of autonomy, competence, and relatedness in medical teaching.

According to SDT, experiencing external control or pressure may negatively influence teachers' feelings of autonomy, competence, and relatedness in medical teaching and hence their motivation for medical teaching (Deci & Ryan, 2002). We assumed that teachers without any STQ would need the most external pressure to embark on a qualification track. Most teachers, however, have already obtained a BTQ or higher, enabling them to take individual career steps in medical teaching. Because this could also have been their voluntary personal choice, not imposed on teachers by management, we argued that TQs are positively related to teachers' feelings of autonomy towards medical teaching (Baard, Deci, & Ryan, 2004). Moreover, if TQs help teachers to shape their teaching careers, this may also relate to their feeling of autonomy towards medical teaching.

Obtaining a TQ may make teachers feel more competent in medical teaching because these acknowledgements are based directly on their own educational achievements and competence. Research has shown that organizational resources, such as financial rewards and

career opportunities (De Lange, De Witte, & Notelaers, 2008) that are functional in achieving work goals and that stimulate personal growth and development, are beneficial to the satisfaction of psychological needs (Van den Broeck et al., 2008).

Feelings related to medical teaching may depend on the interpersonal context being either stimulating or controlling (Deci & Ryan, 2008; Gagne & Deci, 2005). Because virtually all departments at the RUMC had already implemented the system of TQs, we assumed that teachers who obtained a TQ felt stimulated by their heads of department and their colleagues. Having many qualified teaching colleagues should enable departments to allocate their teaching tasks to the appropriate qualified teachers more easily, and may also create a more stimulating environment, in which teachers feel related to medical teaching.

In our study, we also hypothesized that higher levels of TQs are related to higher feelings of autonomy, competence, and relatedness towards medical teaching.

We included five control variables which we also expected to be related to the respondents' feelings of autonomy, competence, and relatedness in medical teaching: their sex, their years of working experience at the RUMC, their total job size at the RUMC, the proportion of teaching tasks in their total appointment, and the importance they attached to education at the time of their job application at the RUMC.

METHODS

To answer our research question, we conducted an online survey on medical teaching at the RUMC, gathering data on the defined control variables and on basic need satisfaction in teaching. The survey consisted of categories on personal information, professional roles, teaching tasks, TQs, and Teaching-related Basic Need Satisfaction (T-BNS, see below).

Ethics

The Dean of the Faculty granted approval. Participation was voluntary. Confidentiality was ensured. Faculty were informed that data would only be used anonymously and that participation would be considered as 'informed consent.'

Participants

At the RUMC, 56 departments are involved in medical teaching in the undergraduate programs of Medicine, Biomedical Sciences, Molecular Mechanisms of Disease, and Dentistry. All 2050 academic staff (not all of whom are involved in medical teaching) in these departments received a link in an e-mail inviting them to participate in the survey. The data were collected between June 3rd and July 26th 2013, and two reminders to participate were sent in this period.

Measurements

We used the 5-point Teaching-related Basic Need Satisfaction scale (T-BNS), consisting of three subscales that measured feelings of autonomy, competence, and relatedness towards medical teaching. Typical items for the subscales were: ‘I feel free to perform my teaching tasks the way I think they had best be done’ (autonomy); ‘I feel competent in my teaching tasks’ (competence); ‘I don’t really feel connected with other teachers’ (relatedness) (Engbers et al., 2014). Using the T-BNS, we measured scores on autonomy, competence, and relatedness towards medical teaching on a scale from 0 - 4, a high score meaning high feelings of autonomy, competence, or relatedness towards teaching tasks.

TQs were measured with four dummy variables, indicating whether respondents obtained an STQ, BTQ, ETQ, or FTQ. Respondents who did not obtain a TQ served as a reference category.

We controlled for respondents’ sex (female = 0, male = 1). Years of experience indicates the number of years the respondents had worked at the RUMC. Full-time equivalent (FTE) measures the respondents’ total job size at the RUMC. We included the proportion of teaching tasks in the respondents’ total appointment. We also measured the importance respondents attached to education at the time of their job application at the RUMC on a 4-point scale, ranging from not important (0) to very important (3). Table 1 shows the descriptive statistics of dependent and independent variables prior to the mean-centering procedure. For the analyses, we centered all control variables (except respondents’ sex) around their mean.

Table 1. Descriptive Statistics for Dependent and Independent Variables (n = 767)

| | Min | Max | Mean | Std. Deviation | % |
|--|------|-------|------|----------------|----|
| Dependent Variables | | | | | |
| <i>Basic Need Satisfaction</i> | | | | | |
| Autonomy | 0.17 | 4.00 | 2.65 | 0.59 | |
| Competence | 0.50 | 4.00 | 2.85 | 0.59 | |
| Relatedness | 0.50 | 4.00 | 2.63 | 0.65 | |
| Independent Variables | | | | | |
| <i>Teaching Qualifications</i> | | | | | |
| None (reference cat.) | 0.00 | 1.00 | | | 37 |
| Start | 0.00 | 1.00 | | | 13 |
| Basic | 0.00 | 1.00 | | | 32 |
| Extended | 0.00 | 1.00 | | | 13 |
| Full | 0.00 | 1.00 | | | 5 |
| Control Variables | | | | | |
| Sex (Female = 0) | 0.00 | 1.00 | | | 58 |
| Years of experience | 0.00 | 49.00 | 9.11 | 8.20 | |
| Size of FTE | 0.10 | 1.00 | 0.84 | 0.24 | |
| Proportion of teaching tasks | 0.00 | 1.00 | 0.30 | 0.26 | |
| Importance of education at the time of job application | 0.00 | 3.00 | 1.83 | 0.99 | |

Statistical Analyses

We applied multivariate Ordinary Least Squares (OLS) regression analysis to put our expectations to the test for the relations between TQs and the feelings of autonomy, competence, and relatedness in medical teaching, because the last three were continuous variables.

First, we estimated the uncontrolled relations between TQs and autonomy, competence, and relatedness (Model I). The subsequent model (Model II) included the control variables to control for relevant background characteristics and to avoid conclusions based on spurious correlations: respondents' sex, years of experience, size of full-time equivalent (FTE), proportion of teaching tasks in the respondents' total appointment, and the importance respondents attached to education at the time of their job application at the RUMC.

We applied False Discovery Rate-correction, to adjust our statistical confidence measures, controlling for the number of tests (Benjamini & Hochberg, 1995). As a robustness check, we also analyzed the variables using propensity score matching (PSM).

RESULTS

Respondents

We achieved a response rate of 55%, receiving 1126 complete responses on a total of 2050 academic staff at only those departments that are involved in medical teaching. Of the 1126 respondents, 359 had no involvement in medical teaching, and 767 were actually teachers. We used the 767 teachers as the sample for our analyses because TQs are only (immediately) relevant for teachers.

At the time of the survey (July 2013), 174 teachers at the RUMC had obtained an STQ, 356 teachers a BTQ, 155 an ETQ, and 38 teachers an FTQ. Of these, 103 teachers with an STQ (59% of all teachers with an STQ), 242 teachers with a BTQ (68%), 100 teachers with an ETQ (65%), and 37 teachers with an FTQ (97%) responded. In our sample, 285 teachers had not obtained a TQ (37%). Whereas the distribution of all academic staff was 48% male and 52% female, 58% of our sample were male and 42% were female. In terms of sex, therefore, the sample was not representative of all academic staff at the RUMC ($X^2 = 29.3$; $df = 1$; $\alpha = 0.01$). The sample was not representative in terms of participants with a central educational position (a limited number of defined educational positions at the RUMC) ($X^2 = 23.9$; $df = 1$; $\alpha = 0.01$); 26.7% of the sample had a central educational position, and this was almost 20% in the total academic staff. The sample was not representative in terms of age ($X^2 = 472$; $df = 4$; $\alpha = 0.01$), as the distribution of the sample contained relatively fewer academic staff under 40 and relatively more staff between 40 and 60.

Relations between Teaching Qualifications and Feelings of Autonomy, Competence, and Relatedness in Medical Teaching

The relations between TQs and feelings of autonomy, competence, and relatedness in medical teaching are summarized in Table 2 and explained below.²

Autonomy

Model I shows a significant relation between feelings of autonomy towards teaching tasks and obtaining an FTQ ($b = 0.26$). The estimate of 0.26 for teachers with an FTQ indicates that teachers with an FTQ on average have a 0.26 higher score on autonomy, measured on a scale from 0 - 4, than teachers who did not obtain a TQ at all. The single asterisks indicates significance at the $p < 0.05$ level. Teachers who obtained a BTQ, ETQ, or FTQ did not feel more autonomous in performing teaching tasks than teachers who did not obtain a TQ at all. We found that teachers who obtained a TQ did not feel more autonomous in performing teaching tasks than teachers who did not obtain a TQ at all, when the included control variables in Model II were kept constant.

Competence

Model I shows that teachers with a BTQ or higher felt more competent towards their teaching tasks than teachers without a TQ. After controlling for the included variables in Model II, the relations between TQs and feelings of competence remained significant: teachers who obtained a BTQ ($b = 0.15$), an ETQ ($b = 0.18$), or an FTQ ($b = 0.25$) still felt more competent towards teaching tasks than the reference category, i.e., teachers without a TQ.

Relatedness

Model I shows that teachers with an ETQ or higher felt more related towards medical teaching than teachers without a TQ. The found relations between TQs and feelings of relatedness are no longer significant in Model II with the added control variables, meaning that teachers who obtained a TQ (all levels) did not feel more related to others when fulfilling their teaching tasks than teachers who did not obtain a TQ at all. It would appear, therefore, that the relation between TQs and feelings of relatedness is partly explained by some of the control variables, such as the proportion of teaching tasks and the importance teachers attached to education at the time of their job application.

If we look at the control variables, all significant b-estimates in Table 2 are positive (except the b-estimate for sex), indicating positive relations between the control variables and teachers' feelings of autonomy, competence, and relatedness in medical teaching.

More specifically, teachers with relatively larger teaching tasks felt more autonomous towards medical teaching than teachers who are less involved in education, and teachers who attached more importance to education at the time of their job application felt more autonomous towards medical teaching than teachers who attached less importance to education at the time of their job application.

² PSM yielded similar results. Additional analyses available upon request.

Table 2. Regression of Dimensions of Motivation: Unstandardized Effects of Teaching Qualifications (N=767)

| | Autonomy | | | | | Competence | | | | | Relatedness | | | | | | | |
|--|----------|------|----|----------|------|------------|---------|------|----|----------|-------------|----|---------|------|----|----------|------|----|
| | Model I | | | Model II | | | Model I | | | Model II | | | Model I | | | Model II | | |
| | b | s.e. | | b | s.e. | | b | s.e. | | b | s.e. | | b | s.e. | | b | s.e. | |
| Teaching Qualifications | | | | | | | | | | | | | | | | | | |
| No TQ (reference cat.) | | | | | | | | | | | | | | | | | | |
| Start (STQ) | -0.09 | 0.07 | | -0.13 | 0.07 | | 0.10 | 0.07 | | 0.07 | 0.06 | | 0.05 | 0.07 | | 0.02 | 0.07 | |
| Basic (BTQ) | 0.02 | 0.05 | | -0.06 | 0.05 | | 0.28 | 0.05 | ** | 0.15 | 0.05 | ** | 0.10 | 0.06 | | -0.03 | 0.06 | |
| Extended (ETQ) | 0.11 | 0.07 | | 0.01 | 0.07 | | 0.36 | 0.07 | ** | 0.18 | 0.07 | ** | 0.21 | 0.08 | * | -0.00 | 0.08 | |
| Full (FTQ) | 0.26 | 0.10 | * | 0.11 | 0.11 | | 0.51 | 0.10 | ** | 0.25 | 0.10 | ** | 0.50 | 0.11 | ** | 0.19 | 0.11 | |
| Control variables | | | | | | | | | | | | | | | | | | |
| Sex (0 = female) | | | | -0.04 | 0.04 | | | | | -0.08 | 0.04 | | | | | -0.13 | 0.05 | ** |
| Years of experience | | | | 0.00 | 0.00 | | | | | 0.01 | 0.00 | ** | | | | 0.01 | 0.00 | * |
| Size of FTE | | | | 0.01 | 0.11 | | | | | 0.31 | 0.10 | ** | | | | 0.12 | 0.11 | |
| Proportion of teaching tasks | | | | 0.46 | 0.10 | ** | | | | 0.53 | 0.10 | ** | | | | 0.96 | 0.11 | ** |
| Importance of education at job application | | | | 0.09 | 0.02 | ** | | | | 0.10 | 0.02 | ** | | | | 0.05 | 0.02 | * |
| Intercept | 2.63 | 0.03 | ** | 2.70 | 0.12 | ** | 2.69 | 0.03 | ** | 2.80 | 0.04 | ** | 2.54 | 0.04 | ** | 2.68 | 0.04 | ** |
| R ² | 0.02 | | | 0.11 | | | 0.07 | | | 0.18 | | | 0.03 | | | 0.20 | | |

Level of significance based on False Discovery Rate-correction. ** $p < 0.01$; * $p < 0.05$. two-tailed test.

Models I show the uncontrolled relations between TQs and autonomy, competence, and relatedness, respectively.

Models II show the relations between TQs and autonomy, competence, and relatedness, respectively, while controlling for the included control variables.

Teachers with more years of experience also felt more competent towards medical teaching than teachers who were less experienced. Teachers with a larger FTE felt more competent towards medical teaching than teachers with a smaller FTE. Teachers with a larger proportion of teaching tasks felt more competent towards medical teaching than teachers with a smaller proportion of teaching tasks. Teachers who attached more importance to education at the time of their job application, finally, felt more competent towards medical teaching than teachers who attached less importance to education at the time of their job application.

The estimates indicate that female teachers felt more related to others when fulfilling teaching tasks than their male colleagues ($b = -0.13$). Teachers with more years of experience felt more related to others when fulfilling teaching tasks than teachers who had fewer years of experience. Teachers with a larger proportion of teaching tasks felt more related to others when fulfilling these tasks than teachers with a smaller proportion of teaching tasks. And teachers who attached more importance to education at the time of their job application felt more related to others when fulfilling their teaching tasks than teachers who attached less importance to education at the time of their job application.

The findings in Table 2 do not allow us to determine whether higher levels of TQs are significantly related to higher feelings of autonomy, competence, and relatedness towards medical teaching. Therefore, we summarized the results of regression analysis with different reference categories in Tables 3 – 5, to study the contrasts between the different TQ levels more specifically.

Table 3 shows no differences in feelings of autonomy for any of the contrasts between the different TQ levels.

Looking at Table 4, we find an estimate of -0.15 in the second cell. This indicates that teachers who had obtained a BTQ on average have a 0.15 higher score on competence, measured on a scale from 0 – 4, than teachers without a TQ. Grey shading of the cell indicates that this finding is significant. The other two significant findings in Table 4 show that teachers with an ETQ and teachers with an FTQ also felt more competent towards medical teaching than teachers without a TQ. Although we find larger b-estimates for increasing levels of TQs, the coefficients for the different TQs are not significant.

Table 3. Unstandardized Effects of Teaching Qualifications on Feelings of Autonomy towards Medical Teaching (N=767)

| | STQ | BTQ | ETQ | FTQ |
|-------|----------------------------|-----------------------------|-----------------------------|-----------------------------|
| No TQ | 0.13 <i>0.06</i> | 0.06 <i>0.05</i> | -0.01 <i>0.07</i> | -0.11 <i>0.11</i> |
| STQ | | -0.07 <i>0.07</i> | -0.14 <i>0.09</i> | -0.24 <i>0.12</i> |
| BTQ | | | -0.07 <i>0.07</i> | -0.17 <i>0.10</i> |
| ETQ | | | | -0.10 <i>0.11</i> |

Bold characters are b estimates.

Italic characters are standard errors.

Level of significance based on False Discovery Rate-correction.

No significant findings ($p < 0.05$, two-tailed test).

NB: effects of control variables have been estimated but not included in this Table.

In Table 5, we find no differences in feelings of relatedness for any of the contrasts between the different TQ levels.

This means that teachers with a BTQ or higher feel more competent towards medical teaching than teachers without a TQ, but we find no evidence for our expectation that higher levels of TQs are related to higher feelings of autonomy, competence, and relatedness towards medical teaching.

Table 4. Unstandardized Effects of Teaching Qualifications on Feelings of Competence towards Medical Teaching (N=767)

| | STQ | BTQ | ETQ | FTQ |
|-------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| No TQ | -0.07 <i>0.06</i> | -0.15 <i>0.05</i> | -0.18 <i>0.07</i> | -0.25 <i>0.10</i> |
| STQ | | -0.08 <i>0.07</i> | -0.11 <i>0.08</i> | -0.18 <i>0.11</i> |
| BTQ | | | -0.02 <i>0.07</i> | -0.10 <i>0.10</i> |
| ETQ | | | | -0.08 <i>0.11</i> |

Bold characters are b estimates.

Italic characters are standard errors.

Level of significance based on False Discovery Rate-correction.

Significant findings are shaded ($p < 0.05$, two-tailed test).

NB: effects of control variables have been estimated but not included in this Table.

Table 5. Unstandardized Effects of Teaching Qualifications on Feelings of Relatedness towards Medical Teaching (N=767)

| | STQ | BTQ | ETQ | FTQ |
|-------|-----------------------------|----------------------------|-----------------------------|-----------------------------|
| No TQ | -0.02 <i>0.07</i> | 0.03 <i>0.05</i> | 0.00 <i>0.08</i> | -0.19 <i>0.11</i> |
| STQ | | 0.05 <i>0.07</i> | 0.02 <i>0.09</i> | -0.17 <i>0.12</i> |
| BTQ | | | -0.03 <i>0.07</i> | -0.22 <i>0.11</i> |
| ETQ | | | | -0.19 <i>0.12</i> |

Bold characters are b estimates.

Italic characters are standard errors.

Level of significance based on False Discovery Rate-correction.

No significant findings ($p < 0.05$, two-tailed test).

NB: effects of control variables have been estimated but not included in this Table.

CONCLUSION

The main research question we set out to answer was: To what extent are TQs related to motivation in terms of feelings of autonomy, competence, and relatedness in medical teaching?

We expected beneficial outcomes of TQs on teachers' feelings of autonomy, competence, and relatedness in medical teaching, based on literature about the positive effects of job resources on well-being and motivation (Schaufeli & Bakker, 2004; Van den Broeck et al., 2008).

After controlling for alternative explanations, we found relations between TQs and higher feelings of competence towards medical teaching: Teachers who obtained a BTQ, ETQ, or FTQ feel significantly more competent in their teaching tasks than teachers without a TQ.

The results of our regression analysis can be interpreted in various ways. Our findings on competence may imply that the TQ policy improves teachers' motivation for medical teaching by fulfilling the basic need of feeling competent in medical teaching. A second interpretation is that TQ policy is reaching those teachers whom this policy is meant to reach: confident and motivated teachers, who feel more competent towards their teaching tasks. The relations we found between TQs and feelings of competence towards medical teaching could also be interacting relations, meaning that teachers who obtained a TQ and who already felt more competent in teaching have a basic need for feeling competent that could have been satisfied even more by obtaining a TQ.

We could not confirm clear relations between having a TQ and feelings of autonomy and relatedness. A higher level of TQ did not relate to a higher feeling of competence towards medical teaching.

As we cannot claim these relations to be causal, no hard conclusions can be drawn from these findings, but they are in line with the literature about the application of organizational resources for optimal personal well-being (Van den Broeck et al., 2008). The findings are less in line with the literature about autonomy support (Baard et al., 2004).

The relations we found between TQs and higher feelings of competence towards medical teaching suggest that, if we want to include all non-qualified teachers in the TQ policy, we should appeal to their feelings of competence towards medical teaching. Enthusiastic and motivated teachers with higher-level TQs could be the right agents to point out the possible benefits of obtaining a TQ for their colleagues' teaching position or -career. This career perspective could also appeal more to teachers' feelings of autonomy towards medical teaching. Teachers with higher-level TQs could also start and promote a community of medical teaching professionals, to which new teachers can feel related. This way, we could shape TQ policy in such a way that it also contributes maximally to feelings of relatedness in medical teaching, especially for male teachers, as they appear to be feeling less related to medical teaching than their female colleagues.

Next, years of experience proved to be positively related to teachers' feelings of competence and relatedness towards medical teaching, and the proportion of teaching tasks in the respondents' total appointment also proved to be positively related to teachers' feelings of autonomy, competence, and relatedness towards medical teaching. This may call for us to provide opportunities to gain experience in medical teaching, preferably as early as possible.

In addition, this may call for teaching positions that are sufficiently robust to build teaching experience.

Lastly, the importance respondents attached to education at the time of their job application at the RUMC was positively related to feelings of autonomy, competence, and relatedness towards medical teaching. This finding implies that a specific question about the importance applicants attach to education should be included in every application procedure for new staff at a University Medical Center.

There are some limitations to our research. With cross-sectional data gathered at one moment, we cannot claim causal relations. There is a need for additional research to further scrutinize the causal or interacting relations between TQs and feelings of autonomy, competence, and relatedness in teaching, preferably with panel data.

Furthermore, we should study to what extent our control variables explain the relation between TQs and feelings of autonomy and relatedness towards medical teaching. Future research should also focus on teachers' perceived benefits of policy initiatives such as the TQ policy for their own personal development and careers in medical teaching.

Moreover, our results show that the relations between TQs and feelings of autonomy, competence, and relatedness towards teaching are different. This raises the question how policy initiatives that intend to encourage medical teaching can appeal more to all basic psychological needs. The optimal conditions for policy initiatives, therefore, should be determined more specifically. Finally, the role of departments should be explored, as departments play an important part in implementing policy initiatives.

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