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The impact of teachers' self-efficacy and classroom externalising problem behaviours on emotional exhaustion: Between- and within-person associations

Kirsten Hoogendijk^{1,2} · Nouchka T. Tick³ · Adriaan W. H. Hofman⁴ · Rinske J. Windig² · Judith G. Holland⁶ · Sabine E. Severiens¹ · Patricia Vuijk⁵ · Dolf van Veen⁶

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Abstract

Teaching can be a challenging profession, which puts teachers at high risk for developing burnout symptoms, such as emotional exhaustion. In this study we aim to investigate the interplay between classroom externalising problem behaviours (as a job demand), teachers' self-efficacy (as a job resource) and emotional exhaustion over a school year. Conducting three measurements during a school year among 103 Dutch primary education teachers, we examine the sensitivity for, and the individual development of, emotional exhaustion. Findings show that emotional exhaustion, classroom externalising problem behaviours, and teachers' self-efficacy are stable constructs in teachers. Traditional (between-person) cross-lagged panel models indicate that teachers with low levels of self-efficacy are more likely to develop emotional exhaustion during the school year, compared to their colleagues. We found no evidence that teachers confronted with classroom externalising problem behaviours were more likely to develop emotional exhaustion. Random intercept (within-person) cross-lagged panel models indicate that teachers with high levels of classroom externalising problem behaviours do not show increased emotional exhaustion at a later time point. For self-efficacy and emotional exhaustion, we could not estimate the within-person model due to limited variance in the variables. Implications of these findings and suggestions for further research were discussed.

Keywords Burnout symptoms · Self-efficacy · Classroom externalising problem behaviours · Within-person · Between-person

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Introduction

To provide today's youth with high quality education, effective teachers are imperative. However, teaching can be considered a challenging profession, and many teachers experience quite some stress in their daily work (Evers et al., 2004; Gu & Day, 2007). Compared to other professions, burnout symptoms among teachers are relatively high and contribute to a relatively high absence rate and to teachers leaving the teaching profession (Hooftman et al., 2019). For senior teachers, burnout problems are an important predictor of early retirement (Skaalvik & Skaalvik, 2011). Teachers who are at leave due to burnout problems may impact the workload of their colleagues as well (Van Droogenbroeck et al., 2014). Burnout among teachers can thus have substantial financial consequences and pose a threat to the quality of our education, which impacts the future academic development of many children. It is therefore vital to promote the occupational wellbeing of teachers. To do this effectively, insight into teachers' sensitivity for, and the individual development of, emotional exhaustion is essential. In this study, we aim to gain insight into the development of teachers' emotional exhaustion and gather more knowledge about the longitudinal development of burnout symptoms. This study was part of an effect study in which a randomized controlled trial (RCT) was conducted to study effects of the Key2Teach-intervention (Hoogendijk et al., 2018; Hoogendijk et al., 2020). Intervention-effects were not subject of the current study.

Theoretical background of burnout

According to the Job Demand-Resources model (JD-R model) burnout can be described as resulting from an imbalance between demands and resources in the working environment (Bakker & Demerouti, 2007; Demerouti et al., 2001). For teachers, job demands refer to aspects of the job that require physical or mental effort, such as challenging behaviour of students, a lack of shared reflection with colleagues, or a high administrative workload. On the other hand, job resources contribute to feeling effective, such as achieving goals with students, or feelings of personal growth and enjoyment. According to the JD-R model, and imbalance between job demands and job resources contributes to the development of stress and emotional exhaustion, which can be regarded as the main characteristic of burnout (Maslach & Jackson, 1981; Taris et al., 2004; Skaalvik & Skaalvik, 2018). When aiming to prevent emotional exhaustion among teachers, it is important to take the respective roles of significant demands and

resources into account and gather more knowledge about the longitudinal development of burnout symptoms.

Job demands: classroom externalising problem behaviours

One of teachers' main job demands concerns the behaviours they encounter in class. Teachers interact with students on a daily basis, and the relationship they engage in with their students has been shown to play a more important role in the development of emotional exhaustion than teachers' relationships with colleagues, supervisors or parents (Van Droogenbroeck et al., 2014). Interacting with students who exhibit externalising problem behaviours, such as distractibility, hyperactivity, disobedience and hostile aggression, is especially difficult for teachers (Harrison et al., 2012; Kaakinen, 2017; Tsouloupas et al., 2010). Classroom externalising problem behaviours have been associated to stress and emotional exhaustion in teachers, and to motivation to leave the profession (Aloe et al., 2014; Skaalvik & Skaalvik, 2007). Dealing with externalising problem behaviours can thus be considered an important job demand.

It is however important to note that teachers' emotional exhaustion may also have an impact on the development of students' problem behaviours (Kokkinos et al., 2005). Research suggests that teachers who are stressed or exhausted, are less tolerant with regard to the challenging behaviours of students, which can lead to an increased use of punitive classroom practices (Bibou-Nakou et al., 1999). These, in turn, may lead to an increase in externalising problem behaviours (Bru et al., 2002). Thus, to unravel the role of classroom externalising problem behaviours as a possible risk factor for the development of emotional exhaustion among teachers, longitudinal research focusing on transactional relations between these variables is necessary.

Job resource: teacher's self-efficacy

An important job resource for teachers regards their sense of self-efficacy. Based on the social-cognitive theory, teachers' sense of self-efficacy refers to their perception of their own capacity to stimulate learning and engagement of students, even among difficult or unmotivated students (Bandura, 1997; Tschannen-Moran & Woolfolk Hoy, 2001). Feelings of self-efficacy help teachers to motivate students, to involve them in the classroom practices and to manage their behaviours (Dunn & Rakes, 2011). Teachers' sense of self-efficacy is considered an important preventive factor in the development of emotional exhaustion (Brouwers & Tomic, 2000). In a recent review of Zee and Koomen

(2016), a consistent association between teachers' sense of self-efficacy and their levels of emotional exhaustion is described, indicating that teachers with a high sense of self-efficacy experience less emotional exhaustion than teachers with a low sense of self-efficacy (Zee & Koomen, 2016). Feelings of self-efficacy can thus be considered a serious job resource.

However, this relationship may work both ways. Brouwers and Tomic's (2000) research showed that self-efficacy has a longitudinal impact on emotional exhaustion, but also pointed to a reversed impact of emotional exhaustion on self-efficacy. In line with this, Brouwers et al. (2001) found some evidence of a feedback loop between self-efficacy and emotional exhaustion. Again, to obtain a better insight into the dynamic behind the (protective) role of self-efficacy in the development of emotional exhaustion it is important to consider possible transactional relations.

Examining both between- and within-person associations

Research into the relation between emotional exhaustion, classroom externalising problem behaviours and self-efficacy is mainly based on cross-sectional associations or regression analysis. These statistical analyses do not allow for identifying longitudinal transactional relations and casual effects between constructs. When studying transactional relations, it is important to use a longitudinal design that enables us to explore transactional relations between constructs over time. By doing so, we aim to shed more light on the dynamics behind the impact of job demands and job resources on the development of emotional exhaustion.

Many previous studies that focused on transactional relations between a wide variety of constructs have used cross-lagged panel models (CLPM) as a way to identify transactional relations (e.g. Brouwers & Tomic, 2000; Fernet et al., 2012; Breeman et al., 2015; Doumen et al., 2008; Lier et al., 2012). These models allow us to establish the unique contributions of classroom externalising problem behaviours and teachers' self-efficacy on teachers' emotional exhaustion and vice versa. Although the widespread use of such CLPMs, a number of researchers and methodologists have recently instigated a discussion on the use of such models when aiming to draw conclusions regarding individual developmental trajectories. These CLPMs, as many other longitudinal statistical models, capture co-variation in rank order positions of individuals as a proxy for understanding causal processes, and therefore do not distinguish between-person changes and within-person fluctuations over time (*see for more detailed information on this debate*: Hamaker et al., 2015; Keijsers, 2016; Berry & Willoughby, 2017).

For that reason, researchers consider the CLPM to provide insight into differences *between* individuals, not within individuals.

To gain insight into how an individual develops, one needs to obtain insight into the *within*-person development. Other data-analytical techniques have been proposed that provide insight into this, while accounting for between person-variability, such as the random intercept cross-lagged panel models (RI-CLPM; as recommended by Keijsers, 2016). These advanced models distinguish the between-person variance and the within-person variance, and can help us to draw conclusions regarding factors that impact individual developmental trajectories over time.

Thus, both between-person models and within-person models may inform us in a different way about the development of emotional exhaustion. Between-person models can help us to identify which teachers are more likely to cope with high levels of emotional exhaustion and which variables play a role in this, whereas within-person models can shed more light on the underlying psychological processes that take place when an individual teacher develops emotional exhaustion. Both insights can be of importance when aiming to prevent or reduce emotional exhausting in teachers and will add new knowledge to the existing research literature.

Research questions

In this study, in line with the JD-R model, we aim to explore the relationship between a specific job demand, classroom externalising problem behaviours, and a job resource, teachers' self-efficacy, in the development of burnout symptoms among teachers. This way, we aim to gain more insight into the sensitivity for, and individual development of, emotional exhaustion in teachers. We focused on the time span of one school year, as for most teachers this is the period that they teach a specific classroom composition. This may give insight in the impact that a specific class may have on a teachers' occupational wellbeing, and in the dynamic that takes place over the course of a school year.

Based on prior research, we formulate the following hypotheses:

1. Teachers' emotional exhaustion, classroom externalising problem behaviours, and teachers' sense of self-efficacy were associated during the school year.
2. Higher levels of classroom externalizing problem behaviours or lower levels of self-efficacy were expected to predict high levels of emotional exhaustion during the school year.
3. At the within-person level, teacher's classroom externalising problem behaviours or teacher's sense of

self-efficacy were expected to predict the individual development of emotional exhaustion during the school year.

Method

Design

Data used in this study were collected as part of the Key2Teach study (Dutch Trial Register: NTR3811). Two cohorts of primary school teachers and their students were included (school year 2013–2014 and school year 2014–2015). Teachers could participate if they taught in grades 3 to 6 for at least 2,5 days per week, and at least two teachers had to participate in each school. Inclusion of teachers took place between June and September 2013 (first cohort) and March and July 2014 (second cohort) and -due to reasons of feasibility, power and expected dropout- inclusion ended when a number of 150 teachers was reached. Twenty-three teachers withdrew before the start of the study, either because teachers considered the study too much of a time investment or were too busy with other tasks. Another twenty-four teachers were excluded for not meeting the inclusion criteria of the Key2Teach-effect study regarding their levels of student externalizing problem behaviours of conflict ($n = 13$), or withdrawing permission of participation for the student ($n = 11$). The total amount of participating teachers in the sample is 103. For more information on the inclusion procedure see (Hoogendijk et al., 2018; Hoogendijk et al., 2020). The research protocol was approved by the Medical Ethics Committee Southwest Holland (METC-ZWH, 13-023).

This study was executed as part of a randomized controlled trial, for which half of the teachers received the intervention Key2Teach. Key2Teach is a teacher-focused coaching intervention and designed to improve the relationship between teachers and students with externalising problem behaviours by providing them with insight into their mental representation of the teacher-student relationship (first phase) and to improve their interaction patterns with these students (second phase) (Hoogendijk et al., 2018; Hoogendijk et al., 2020).

Three measurements took place during the school year. Baseline data (T1) were collected at least six weeks after the start of the school year and before the intervention started. When the first phase of Key2Teach was completed, the mid-intervention measurement (T2) took place in January, and the post-intervention measurement (T3) took place in June, after Key2Teach was finished. The teacher had access to a website where questions could be answered digitally.

Participants

Our sample consisted of 103 teachers: 46 teachers in the first cohort (2013–2014) and 57 in the second cohort (2014–2015). Our group of teachers ($n = 103$) consisted of 76.7% female teachers, and teachers were on average 39.24 years old (ranging between 23.50–62.67 years). Teachers had an average of 12.62 years of working experience (ranging between 0 and 38 years). Of the 103 teachers who participated during the first measurement, nine dropped out over the course of the study. Dropout was not related to condition ($\chi^2(1) = .01, p = .93$), teachers' age ($t(101) = 1.00, p = .32$) or teachers' gender ($\chi^2(1) = .00, p = 1.00$).

The mean number of students in each class was 23 (total of 2367 students). For 74% of the students, parental permission was obtained allowing their participation in the study ($n = 1746$). The main age of the students was 9.73 years (SD: 1.19, range 5.92–13.17).

Measures

Classroom externalising problem behaviours of students

The teacher rated externalising problem behaviours of students using the Strengths and Difficulties Questionnaire for Teachers (SDQ-T; Van Widenfelt et al., 2003). Teachers' scores on the subscales Conduct problems and Hyperactivity were included in this study. Both subscales ($\alpha = .85$) together represent the amount of externalising problem behaviours exhibited by the student (Goodman, 2001). Teachers rated items such as '*Often fights with other children or bullies them*' and '*Restless, overactive, cannot stay still for long*' on a three-point scale on which 0 = not true, 1 = sometimes true, and 2 = completely true. Validity of the SDQ has been evaluated as good in previous studies (Goodman, 2001; Van Widenfelt et al., 2003). As we were interested in classroom level problem behaviours, scores of individual students were aggregated to compute an overall classroom externalising problem behaviours score.

Teacher's sense of self-efficacy

Teacher's sense of self-efficacy was assessed with the short version of the Teachers' Sense of Efficacy Scale (TSES; Tschannen-Moran & Woolfolk Hoy, 2001). The TSES consists of 12 items (for example '*how much can you do to motivate students who show low interest in school work?*'). The TSES assesses the extent to which a teacher feels competent in motivating children for schoolwork, feels competent to give instruction in a way that is suitable for the students' needs and feels competent to manage what happens in the classroom. Although the TSES is usually measured on a

9-point rating scale, teachers in the present study responded on a 5-point Likert scale, ranging from 1 (nothing) to 5 (a great deal). This Likert scale was in line with various other questionnaires that were used in the study. Positive correlations with other measurement instruments for self-efficacy in general, as well as specifically for teachers provide evidence for the convergent validity of the TSES (Tschannen-Moran & Woolfolk Hoy, 2001). Cronbach’s α for the TSES that was used in this study was .80, supporting the internal consistency of the questionnaire.

Teacher’s emotional exhaustion

Emotional exhaustion was assessed by having teachers complete the Emotional Exhaustion subscale of the Dutch version of the Maslach Burnout Inventory, the Utrechtse Burnout Schaal for teachers (UBOS-L; Schaufeli & Van Dierendonck, 2000). The Emotional Exhaustion subscale assesses to what extent teachers experience feelings of strain, particularly chronic fatigue resulting from overtaxing work (Hakanen et al., 2006) and consists of 8 items (for example ‘I feel emotionally drained from my work’; $\alpha = .83$). Items were rated on a 7-point Likert scale, ranging from 0 (never) to 6 (every day). Validity of the UBOS-L has been demonstrated by predicting drop-out and illness of teachers due to psychological work-related symptoms (Schaufeli & Van Dierendonck, 2000).

Data-analysis

Models were fitted in Mplus 8 (Muthén & Muthén, 1998–2017). This software package allows for the use of full information maximum likelihood (FIML) estimation to account for missing data as a consequence of loss-to-follow up and non-response. Yet, only a small amount of data was missing. Only 1 % of the participating teachers did not provide data on the SDQ, TSES or UBOS at the first measurement, 3% on the second measurement and 4% on the last measurement. We applied maximum likelihood estimation with robust errors (MLR) to account for non-normality.

Fit of the theoretical models to the data was tested using several absolute and relative fit indices: Absolute model

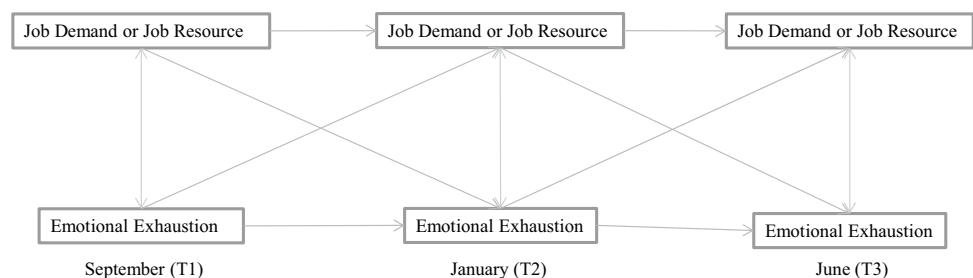
fit was determined by the model χ^2 . A non-significant χ^2 is an indication of good model fit. The comparative fit index (CFI) and the root mean square error of approximation (RMSEA) were also used. The CFI indicates misfit of a specific model, with $>.95$ representing a close fit, and $>.90$ representing an acceptable fit. The RMSEA is an absolute fit indices of the degree of misfit in the model, with values $\leq .06$ reflecting a close fit, and $\leq .08$ a satisfactory fit (Hu & Bentler, 1999). We conducted Wald tests to examine whether individual paths were time invariant, i.e. whether stability and cross-lagged paths significantly differed between T1-T2 versus T2-T3. Wald tests for the tested models indicated that the different paths were time invariant. Therefore, these parameters were constrained over time, reducing model complexity (Hamaker et al., 2015).

To answer the first research question, we calculated correlations between the three outcome variables across the three measurements. In this way we were able to give a preliminary overview of how these variables are associated.

To analyse the between effects of the variables of interest, we applied two cross-lagged panel models (CLPM, Fig. 1; Kline, 2016), one for classroom externalising problem behaviours and emotional exhaustion and one for self-efficacy and emotional exhaustion. Such CLPMs were fit including all autoregressive (or stability) paths and correlations between observed scores, and all cross-lagged paths linking, for example, classroom externalising problem behaviours to emotional exhaustion (and vice versa) over time (Kline, 2016). These models enable us to establish longitudinal relations between variables over time above and beyond cross-sectional associations.

As intervention effects were not the aim of this study, to find out to what extent this design may have impacted our results, we examined if the outcomes of these models were related to study condition (intervention vs control). This was not the case for emotional exhaustion ($b = -.17, p = .32$), classroom externalising problem behaviours ($b = -.83, p = .07$) and self-efficacy ($b = .08, p = .15$). Furthermore, parameter estimates were controlled for study condition (intervention vs. control). For model parsimony, only the

Fig. 1 Cross-lagged panel model (CLPM) for job demand or job resource and Emotional Exhaustion



significant associations between study condition and the parameter estimates at each measurement were retained in the model.

To analyse the within effects of the variables of interest, we first calculated ICC’s to determine how much of the variance in the three outcome variables can be explained by differences between persons or by fluctuations within a person. Subsequently, we applied a random intercept cross-lagged panel model (RI-CLPM, Fig. 2) for the three outcome variables (Hamaker et al., 2015; Keijsers, 2016). Within such a model, variance at the within-level (inter-individual variance) is distinguished from variance at the between-level (intra-individual variance). This model also accounts for the fact that measurement occasions are nested within individuals, which makes it possible to interpret results in terms of developmental pathways for individual persons (Hamaker et al., 2007). This modelling strategy is based on the approach as described by Hamaker et al. (2015), and applied by Keijsers (2016), and Poel et al. (2016), Bogaerts et al. (2019) and Maas et al. (2021).

Again, to test whether study condition (intervention vs control) impacted model fit of the RI-CLPM, we controlled the between group variance for study condition. Model fit was slightly worse ($\chi^2(9) = 19.10, p = .02$; CFI = .955; TLI = .895; RMSEA (90%) = .10 (.04;.17); SRMR = .06),

than fit of the model without correcting for condition ($\chi^2(9) = 16.17, p = .06$; CFI = .964; TLI = .940; RMSEA (90%) = .09 (.00;.16); SRMR = .07). As this indicates a lack of support for the presence of differences between intervention and control group with regard to the links between emotional support and externalising problem behaviours in the class, for reasons of parsimony, we did not control for condition in our final model.

Results

Hypothesis 1: Constructs of interest were associated during the school year

Regarding the first research hypothesis, a preliminary overview of correlations for the three outcome variables is given in Table 1. Results indicated medium to high correlations between the different time points concerning emotional exhaustion (.62–.82), classroom externalising problem behaviours (.32–.74) and self-efficacy (.60–.70), which indicated substantial stability of the ranking order of individuals with regard to their level of emotional exhaustion, classroom externalising problem behaviours and self-efficacy (see Table 1). Relatively high scoring teachers on these constructs were more likely to score high at later time points,

Fig. 2 Random-intercept cross-lagged panel model (RI-CLPM) for job demand or job resource and Emotional Exhaustion

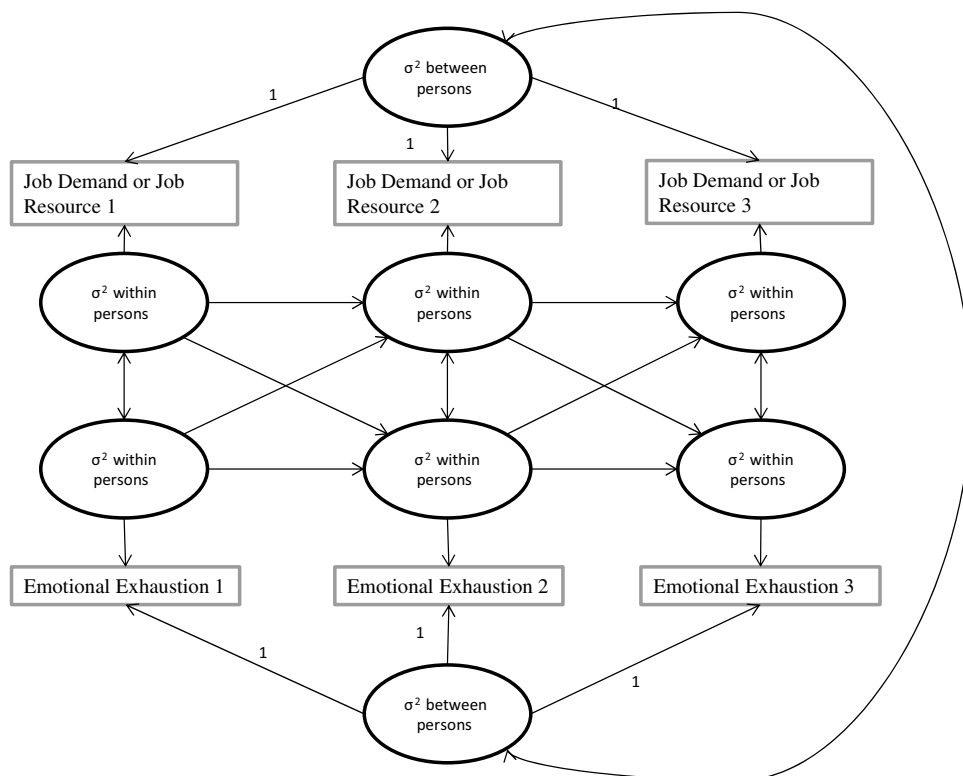


Table 1 Descriptive statistics and correlations between emotional exhaustion, classroom externalising problem behaviours and self-efficacy at three time points

	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1 Emotional Exhaustion T1	102	2.74	0.85	1								
2 Emotional Exhaustion T2	98	2.71	0.91	.74**	1							
3 Emotional Exhaustion T3	90	2.59	0.98	.61**	.81**	1						
4 Self-Efficacy T1	102	3.93	0.34	-.29**	-.31**	-.29**	1					
5 Self-Efficacy T2	98	4.00	0.31	-.06	-.19	-.17	.71**	1				
6 Self-Efficacy T3	90	4.07	0.33	-.01	-.16	-.35**	.56**	.63**	1			
7 Classroom externalising problem behaviours T1	103	3.73	0.91	.21*	.26**	.20	-.09	-.11	-.15	1		
8 Classroom externalising problem behaviours T2	94	3.55	1.13	.13	.26*	.20	-.14	-.28*	-.17*	.75**	1	
9 Classroom externalising problem behaviours T3	88	3.94	2.23	.13	.18	.20	-.05	-.08	-.15	.32**	.43**	1

** . Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

as compared to other teachers. Most correlations between the three outcome variables, were significant at the three time points. This indicates a confirmation of our first hypothesis that teachers with high levels of emotional exhaustion were more likely to report lower levels of self-efficacy and more classroom externalising problem behaviours (see Table 1).

Hypothesis 2: Teachers at risk

In examining what characterizes teachers who are more likely to develop emotional exhaustion symptoms and which variables play a role in this, we conducted two CLPMs. The CLPM for classroom externalising problem behaviours and

Table 2 Standardized parameter estimates for the cross-lagged panel model (CLPM) and random-intercept cross-lagged panel model (RI-CLPM) regarding the associations between classroom externalising problem behaviours (CEPB), emotional exhaustion (EE) across 3 measurements (T1, T2 and T3)

	CLPM				RI-CLPM			
Model fit indices								
AIC	1473.32				1486.74			
BIC	1526.02				1534.17			
χ^2	13.31				16.17			
Df	13				9			
p	.42				.06			
CFI	1.00				.96			
TLI	1.00				.94			
RMSEA (90% CI)	.02 (.00;.10)				.09 (.00;.16)			
Model results								
	<i>B</i>	<i>SE</i>	<i>p_B</i>	β	<i>B</i>	<i>SE</i>	<i>p_B</i>	β
Autoregressive pathways								
CEPB T1 -> CEPB T2	.91	.07	.00	.75	.77	.30	.01	.53
CEPB T2 -> CEPB T3	.91	.07	.00	.45	.77	.30	.01	.32
EE T1 -> EE T2	.83	.06	.00	.75	.79	.15	.00	.69
EE T2 -> EE T3	.83	.06	.00	.78	.79	.15	.00	.73
Cross-lagged pathways								
CEPB T1-> EE T2	.08	.06	.19	.08	.15	.13	.24	.11
CEPB T2 -> EE T3	.08	.06	.19	.09	.15	.13	.24	.15
EE T1-> CEPB T2	-.01	.09	.95	-.00	-.01	.22	.98	-.00
EE T2 -> CEPB T3	-.01	.09	.95	-.00	-.01	.22	.98	-.00
Correlations								
EE - CEPB T1	.16	.08	.04	.21	.09	.50	.85	.20
EE - CEPB T2	.10	.05	.06	.21	.11	.05	.05	.23
EE - CEPB T3	.09	.15	.56	.08	.07	.17	.67	.06

B = unstandardized effects, SE = standard error, p_B = p value of unstandardized effects, β = Standardized effects, which are indicators of effect size

emotional exhaustion showed an adequate fit to the data (Table 2), taken our small sample size into account (Hu & Bentler, 1999). Table 2 also displays the autoregressive associations, cross-lagged associations and correlation (and correlated change) of classroom externalising problem behaviours and emotional exhaustion at three times during the school year. In line with the correlation matrix, the autoregressive paths turned out to be stable during the school year. Even when corrected for cross-sectional correlations, the ranking order with regard to classroom externalising problem behaviours and teachers’ emotional exhaustion was stable over the year. Thus teachers who report high levels of these constructs, score relatively high at these constructs during later time points. However, we did not find any significant cross-lagged pathways, indicating that teachers with high-scoring classrooms on externalising problem behaviours did not have higher emotional exhaustion scores at later time points (and vice versa), when corrected for autoregressive associations.

Table 3 presents the CLPM for teachers’ self-efficacy and emotional exhaustion, which also showed an adequate model fit. Table 3 also displays the autoregressive associations, cross-lagged associations and correlation

(and correlated change) of self-efficacy and emotional exhaustion at three times during the school year. Again, the autoregressive paths for both constructs show stability during the school year, indicating that the ranking order with regard to teachers’ self-efficacy and emotional exhaustion was stable over the schoolyear. A significant cross-lagged path from self-efficacy to emotional exhaustion was determined, indicating that teachers who experienced lower feelings of self-efficacy were relatively more likely to feel emotional exhausted at a later time-point, as compared to other teachers. The second hypothesis was only confirmed regarding the relation between self-efficacy and emotional exhaustion, but not regarding the relation between classroom externalizing problem behaviours and emotional exhaustion.

Hypothesis 3: Externalising problem behaviours and self-efficacy impact the individual development of emotional exhaustion

For the third research hypothesis, we conducted intra-class coefficient scores and two RI-CLPMs. The intra-class coefficient (ICC: a method used for multi-level analysis) of .71 for

Table 3 Standardized parameter estimates for the cross-lagged panel model (CLPM) and random-intercept cross-lagged panel model (RI-CLPM) regarding the associations between teacher’s sense of self-efficacy (SE) and emotional exhaustion (EE) across 3 measurements (T1, T2 and T3)

	CLPM				RI-CLPM			
Model fit indices								
AIC	650.70				Error message, not interpretable			
BIC	706.03							
χ^2	19.73							
Df	12							
p	.07							
CFI	.97							
TLI	.96							
RMSEA (90% CI)	.08 (.00;.14)							
Model results								
	<i>B</i>	<i>SE</i>	<i>p_B</i>	β	<i>B</i>	<i>SE</i>	<i>p_B</i>	β
Autoregressive pathways								
EE T1 -> EE T2	.82	.06	.00	.74				
EE T2 -> EE T3	.82	.06	.00	.78				
SE T1 -> SE T2	.71	.06	.00	.74				
SE T1 -> SE T3	.71	.06	.00	.68				
Cross-lagged pathways								
EE T1 -> SE T2	.02	.02	.30	.06				
EE T2 -> SE T3	.02	.02	.30	.07				
SE T1-> EE T2	-.28	.13	.04	-.10				
SE T2 -> EE T3	-.28	.13	.04	-.09				
Correlations								
EE - SE T1	-.09	.03	.03	-.31				
EE - SE, T2	-.03	.01	.04	-.18				
EE - SE, T3	-.05	.02	.02	-.35				

B = unstandardized effects, SE = standard error, *p_B* = p value of unstandardized effects, β = Standardized effects, which are indicators of effect size

emotional exhaustion reveals that 29% of the variance in emotional exhaustion is explained by fluctuations within a person. For classroom externalising problem behaviours, 66% of the variance were due to the fluctuations within individual classrooms ($ICC = .34$). For self-efficacy, 34% of the variance was due to individual fluctuations ($ICC = .66$). Given that for each of the constructs in this study, a substantial part of the variance was influenced by fluctuations of individual teachers, we conducted RI-CLPM, to distinguish the stable differences between teachers from the fluctuations within individual teachers over time.

The RI-CLPM for classroom externalising problem behaviours and emotional exhaustion revealed an adequate fit (Table 2). Results showed no significant correlation at the between-person level between classroom externalising problem behaviours and emotional exhaustion ($\beta = .24, p = .89$), thus teacher's levels of classroom externalising problem behaviours coincided with their level of emotional exhaustion during the school year. Furthermore, a significant within-person stability path for emotional exhaustion indicates that the deviation of a teacher's score on emotional exhaustion -based on their general trait- can be predicted by the deviation at an earlier time point. Results further showed no significant cross-sectional associations at T1 between the two constructs, nor a significant correlated change at T3. However, we determined a significant correlated change at T2, which indicated that the within-person change in externalising classroom problem behaviours were significantly associated with the within-person change in emotional exhaustion. This indicated that the level of classroom externalising problem behaviours simultaneously changed with the level of emotional exhaustion. This change, however, cannot be attributed to a change in both constructs that occurred three months earlier, but more likely by a time-variant non-modelled third factor. No significant cross-lagged associations were identified. This indicates that a within-person increase in classroom externalising problem behaviours did not predict an individual teacher's increase in emotional exhaustion at a later timepoint (and vice versa). With regard to the within-person fluctuations, results are presented in Table 2. The third hypothesis was not confirmed by this study.

The RI-CLPM for self-efficacy and emotional exhaustion could not be estimated, indicated by an error message for a non-positive definite latent variable covariance matrix. This was likely caused by too little variance in self-efficacy (see supplementary materials on Open Science Framework for the output of this analysis).

Discussion

Burnout symptoms are a substantial problem among teachers, as these symptoms contribute to relatively high absence rates among teachers and leaving of the profession

(Hoofman et al., 2019). In this study we investigated how classroom externalising problem behaviours, as a job demand, and teacher's sense of self-efficacy, as a job resource, impact the presence and development of emotional problems. In our study, we focused on the time span of one school-year, as most teachers teach a specific classroom composition within this period. This may give insight in the impact that a specific class may have on a teachers' occupational wellbeing, and the dynamic that takes place over the course of a school year. We aimed to identify to what extent these job demand and job resource make teachers more likely to cope with high levels of emotional problems, by conducting cross-lagged panel models. To shed more light on the developmental processes that take place within individual teachers, we also conducted random intercept cross-lagged panel models. Below, we discuss our main findings and attempt to interpret these in light of the Job Demand-Resources Model.

Relations between classroom externalising problem behaviours, self-efficacy, and emotional exhaustion

We found, however, that during one school year, there appeared to be clear stability of all variables under investigation. Teachers (or classes) who scored high on these variables at one time point, were also those with highest scores later in the school year. This is consistent with several previous studies that indicated stable pathways of classrooms' externalising problem behaviours during three school years (Doumen et al., 2008), and stable pathways for teachers' self-efficacy during a school year (Praetorius et al., 2017).

Stability of emotional exhaustion

Also in our within-person model, we determined a stable and significant within-person trait for teacher's individual level of emotional exhaustion. This indicated that, during a school year, a teacher's individual development of emotional exhaustion is not very prone to change, and the development of burnout symptoms takes place over a much longer timespan than a single school year. This finding is in line with various previous studies. Hultell et al. (2013) showed that in their study on the development of burnout, more than half of the teachers in their sample showed stable emotional exhaustion rates during three school years, as teachers with low levels of burnout symptoms remained low, medium levels remained medium and high levels remained high. Kinnunen and Salo (1994) showed a decrease in teachers' wellbeing and quality of relationships with students only over a period of eight years. Age and working experience are important predictors for the development of burnout symptoms (Hultell et al., 2013; Schwarzer & Hallum, 2008) and future research could investigate the impact of these factors on the

development of burnout among individual teachers. These results mentioned are also in line with the definition of burnout as a chronic rather than a transient condition (Maslach et al., 2001).

Job demand: classroom externalising problem behaviours and emotional exhaustion

We examined the role of classroom externalising problem behaviours as a day-to-day job demand. In both the between- and within-person models, we did not find evidence for such transactional relations among the teachers in our sample. Being assigned to a classroom with high levels of externalising problem behaviours therefore does not necessarily seem to be a risk factor for teachers in the development of emotional exhaustion, that may have great impact over the course of a school year. This result is not in line with the previous studies that have suggested developmental links between classroom levels of externalising problem behaviours and teachers' emotional exhaustion and the other way around (Aloe et al., 2014; Skaalvik & Skaalvik, 2010; Kokkinos et al., 2005). It is important to note that many of these previous studies relied on correlational or regression analysis, and did not distinguish the variance between teachers from the variance within teachers, which makes it hard to compare their findings to ours. Also, some of these studies have included moderators, such as grade level, teacher age, country, gender of the teacher (Aloe et al., 2014), relation with parents, job satisfaction, time pressure, autonomy or supervisory support (Skaalvik & Skaalvik, 2010), which, due to power issues, we did not account for in our study. Nevertheless, both when comparing teachers, or when examining the development of individual teachers, we did not find a clear relationship suggesting that a job demand such as classroom externalising problem behaviours play an important role in the development of teachers occupational wellbeing, or at least, not over the course of a school year. It is important to note that previous studies acknowledge that teachers do report this kind of behaviour as a source of stress (Aloe et al., 2014; Skaalvik & Skaalvik, 2007; Skaalvik & Skaalvik, 2018). However potential other factors, such as class preparation, teaching itself, or non-teaching-related, such as paperwork and meetings may play a more important role within teachers' perception of stress (Van Droogenbroeck et al., 2014), but maybe also within their perception of the impact of externalising behaviour on class. When asking Dutch teachers about their sources of stress, administrative workload is mentioned by 75% of the teachers in primary education, followed by their responsibility for the performance of their students (Wartenbergh et al., 2020). When studying the underlying psychological processes that play a role in the relation between classroom externalising problem

behaviours and teachers' emotional exhaustion, such factors may need to be taken into account as well.

Job resource: self-efficacy and emotional exhaustion

With respect to the question what characterizes teachers those who are likely to develop burnout symptoms compared to others, we found that teachers who experience lower levels of self-efficacy were more likely to develop emotional exhaustion later on in the school year, relative to their colleagues in the sample. Other studies also found longitudinal relations between teachers' sense of self-efficacy and their level of emotional exhaustion (Fernet et al., 2012; Egyed & Short, 2006; Hultell et al., 2013; Schwarzer & Hallum, 2008). These studies also suggest that this relation may be stronger for teachers with less experience. Due to limited power, we were not able to include teacher experience as a moderating factor. It is possible that the most experienced teachers also experience less stress in teaching. If studies do not distinguish the variance between teachers from the variance within teachers, as was the case for many previous and our model for self-efficacy and emotional exhaustion, they may overestimate potential causal effects. Regardless, our findings indicate the importance of improving teachers' feelings of competence. It is important to note that feelings of incompetence may be considered in the light of the interactions that teachers engage with individual students, as feelings have been shown to vary for different students (Zee et al., 2016).

Prevention of emotional exhaustion

From a perspective of prevention, it is important to note that these results suggest that the impact of job demands and resources on emotional exhaustion may be limited. It appears that if emotional exhaustion is present, it can to some extent be considered chronic and maybe difficult to reduce. It is likely that more stable teacher characteristics, such as their personality traits, also play a role in the development and persistence of burnout symptoms. However, it would not be plausible that the personality of the teacher is completely responsible for the perception of emotional exhaustion (Maas et al., 2021). Other, more chronic aspects of daily work demands and the day-to-day classroom factors that teachers encounter may impact how they experience emotional exhaustion. Factors such as time pressure and social support from the school principal may also play a role (Maas et al., 2021). Given the potential negative consequences of burnout symptoms on teachers' professional functioning (Skaalvik & Skaalvik, 2011), the chronicity of symptoms is worrisome, as this may indicate that interventions are needed if symptoms are present. On the other

hand, and encouragingly, if teachers experience low levels of emotional exhaustion, we found no evidence that the day-to-day fluctuations within the variables of interest can instigate clear changes in their occupational wellbeing.

Limitations

This study had several limitations. First, as we were not able to estimate all desired models, this study should be replicated in bigger samples. If studies do not distinguish the variance between teachers from the variance within teachers, as was the case for many previous studies, they may overestimate potential causal effects. However, in our study, only the RI-CLPM with regard to classroom externalising problem behaviours and emotional exhaustion fit the data. Nevertheless, as far as we know this is one of the first attempts of estimate these longitudinal models including these constructs. This study provides some first new insights and leads into which teachers are more vulnerable and the development of emotional exhaustion in individual teachers during one school year. This information is important when it comes to preventing burnout symptoms among teachers.

Second, from a methodological point of view, the fact that we did not find many cross-lagged associations could be a sign of a wrongly chosen time-lag. However, Praetorius et al. (2017) state that optimal time lags for self-efficacy in relation to teaching quality would be about three to four months, based on calculation methods of Dormann and Griffin (2015). It can be said from the JR-D model that the complex dynamic of interacting job demands and resources may take place over weeks, or even days, so time lags should be very short (Bakker & Demerouti, 2007). However, research on optimal time lags is inconclusive (Scholz, 2019). For our study, intra-class correlations indicated the presence of a reasonable amount of within-variance. In our models these were rather stable across the three measurements. This might have complicated the possibility of finding changes at the within-person level. Besides this, the measures we used may have influenced the cross-lagged associations. For example, when asking “*I feel emotionally drained from my work*” (UBOS), this may be interpreted as referring to a general trait, rather than a state. One may consider using other measures that leave more room for fluctuations. Nevertheless, this is one of the first attempts, as far as we know, to provide some insight into the interplay between job demands and job resources from a between-person and within-person perspective.

Third, another limitation can be mentioned with regard to the instruments used. With regard to classroom externalising problem behaviours, it is important to note that we have asked for teachers’ perceptions. The objectivity of such findings may be impacted by the amount of emotional exhaustions that teachers experience (Bibou-Nakou et al., 1999; Kokkinos et al., 2005). Also, we have used only teacher reports to

assess all variables of interest, which may lead to potentially biased perception of these constructs. In future research the use of different methods, such as classroom observations of student behaviours and teachers’ efficacy, and other informants, such as students or observers, should be considered.

The fourth limitation concerns characteristics of the sample. The data from this study were part of an RCT on the effects of a teacher-focused coaching intervention Key2Teach. This intervention aims to improve a conflictual relationship between a teacher and a student with externalizing problem behaviour. The outcomes of the current study seemed not significantly impacted by the intervention. Previous research did not show intervention effects on teachers’ emotional exhaustion during the course of a school year (Hoogendijk et al., 2018). This lack of intervention effects may have been caused by the fact that Key2Teach primarily focuses on aspects of teacher-student relationship quality, and impact of Key2Teach on teachers’ occupational wellbeing can be seen as secondary outcomes that may become apparent after a longer period of time. However, they may also be the result of sample selection. None of the teachers in our sample had such high levels of emotional exhaustion that burnout could be spoken of, and this makes improvements due to Key2Teach difficult to determine. Future research among teachers with higher levels of emotional exhaustion may provide more insight into the effects of Key2Teach on emotional exhaustion. Including more variation may also help us to gain more insight into the underlying dynamics of the development of teacher burnout problems. Including measurements that help us to gain insight into trait variation, but also state variation of emotional exhaustion, such as daily state measures combined with trait reports (Goetz et al., 2015) may help us to further explore this topic.

Conclusion and practical implications

In conclusion, this study is important as it sheds some light on the impact of different job demands and job resources for teachers. Teachers’ levels of self-efficacy, as a job resource, may characterize teachers at risk for burnout symptoms. Therefore, higher levels of self-efficacy could be considered as a protective factor in reducing levels of stress and emotional exhaustion. Interventions may focus on aspects related to their feelings of competence with regard to their effective teaching. Furthermore, classroom externalising problem behaviours, as a possible job demand, did not put teachers at risk for emotional exhaustion or influence their individual developmental trajectory of emotional exhaustion. Lastly, the results show that emotional exhaustion, but also classroom externalising problem behaviours and self-efficacy were relatively stable during the school year. This fact that symptoms are stable and chronic, and may have clear consequences with regard to teachers’ professional functioning

(Hoofman et al., 2019), suggests that it is important to monitor teachers from early on in their teaching career, to pay timely attention to their occupational wellbeing.

As far as we know, only a limited number of studies have used longitudinal data, multiple measurements, and an advanced methodological approach to investigate the underlying dynamics of the sensitivity for and the individual development of emotional exhaustion. Our results into these dynamics highlight just a small fragment of the complex and dynamic interplay between job demands and job resources that can result in burnout, according to the JR-D model (Demetrouli et al., 2001). Despite the fact that we were not able to identify these constructs as clear and significant predictors and related to the development of emotional exhaustion, this does not mean that these constructs are not important for teachers who are at risk for developing burnout symptoms. As the studies by Skaalvik and Skaalvik (2016; 2017) showed, there are various ways in which classroom externalising problem behaviours and teachers' self-efficacy may impact teachers' emotional exhaustion. Maybe a more complex dynamic is at stake when it comes to the development of emotional exhaustion and this development may take place over a longer period of time, impacted by other risk factors and protective factors as well.

Many variables impact teachers' daily practices in the classroom and therefore potentially exert influence on teachers' wellbeing. These are for example the (fluctuations in the) relations that teachers have with their students, colleagues, and/or students' parents, but also the teaching and non-teaching workload, such as the need to prepare classes, teaching, paperwork and meetings (Van Droogenbroeck et al., 2014). This adds to, and potentially impacts, the personal characteristics and emotional states that teachers bring to work each day; namely, their motivation to teach, job satisfaction, stress, emotional states and other underlying psychological processes that also impact their occupational wellbeing, as are described in the JD-R model (Bakker & Demerouti, 2007; Skaalvik & Skaalvik, 2018). In further research that aims to unravel this complex dynamic, it is important to include various job resources and job demands, longitudinal data, with various data-points resulting from instruments that are able to properly capture the daily practice of teaching. This may help to get a clearer picture of how aspects of teachers daily reality impact the occupational wellbeing of teachers.

Data availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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