



Teacher burnout profiles and proactive strategies

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Abstract

Teacher burnout has been identified as a significant occupational hazard. However, our understanding about individual variations in burnout risk among in-service teachers is still less than sufficient. This study explored socio-contextual burnout risk profiles and their association with the reported use of proactive strategies among in-service teachers by using a person-oriented approach. The survey data were collected from 2310 Finnish in-service primary and lower secondary school teachers using a probability sampling method. In the latent profile analysis, five socio-contextual burnout profiles were identified. The profiles differed from each other in terms of burnout symptoms and proactive strategy use. Results suggested that there is individual variation in teachers' risk of burnout. In addition, the results imply that well-developed proactive strategies, both in terms of self- and co-regulative strategies, are related to lower risk of experiencing socio-contextual burnout. The utilization of strong co-regulative strategies was related to lower risk of experiencing exhaustion and inadequacy during teacher-pupil interactions. However, strong self-regulation combined with low levels of co-regulation was related to an increased risk of experiencing cynicism. This implies that learning proactive strategies may be useful in preventing teacher burnout.

Keywords Burnout profiles · Proactive strategies · Socio-contextual burnout · Teacher profiles · Teachers

Introduction

Teacher burnout is a significant occupational problem worldwide (Akça and Yaman 2010; meta-analysis by García-Carmona et al. 2018). Although burnout rates are generally quite low in Finland (Schaufeli 2018), about 12% of Finnish educators have been shown to suffer from high levels of work stress, which is more than workers in any other branch (Perkiö-Mäkelä

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2009). Similarly, the Trade Union of Education in Finland recently reported that one-third of teachers suffered from extensive work stress (Länsikallio et al. 2018). This implies that a significant number of Finnish teachers are at risk of burnout. Burnout is costly, both personally and for the working environment, since it impairs teachers' functioning, resulting in a decline in quality of work and health (e.g., Saleh and Shapiro 2008; Dupriez et al. 2016; Klusmann et al. 2008). Teachers who suffer from burnout are more likely to experience the symptoms of depression and sleep disturbances (Saleh and Shapiro 2008; Shin et al. 2013), undergo job turnover, and retire earlier (Dupriez et al. 2016; Goddard and Goddard 2006). They also provide a lower quality of instruction (Klusmann et al. 2008) than their counterparts, who have not experienced burnout.

Extensive previous research on teacher burnout has identified several individual and environmental antecedents for teacher burnout, such as workload and years of teaching experience (Brewer and Shapard 2004; Gavish and Friedman 2010; van Droogenbroeck et al. 2014). Also, the importance of social interrelations to teachers' wellbeing has been emphasized (Hakanen et al. 2006; Richards et al. 2018). However, we still know surprisingly little about individual variations in burnout risk experienced by in-service teachers (Bianchi et al. 2015; Brudnik 2004; Hultell et al. 2013), especially in terms of primary social interactions of teachers' work, i.e., with pupils and the professional community. Even less is known about the association between the teachers' burnout risk profiles, and the strategies they use to be proactive in buffering work stressors. In this study, we explored the individual variations between teachers in experiencing socio-contextual burnout risk. The person-oriented strategy was applied in order to identify burnout risk profiles among in-service teachers by using a latent profile analysis (see Leiter and Maslach 2016; Meyer et al. 2013; Virtanen et al. 2018). Moreover, the association with the profiles and the reported use of proactive strategies is explored.

Teachers' socio-contextual burnout

It has been suggested that teacher burnout gradually develops as a result of extensive and prolonged work-related stress (Foley and Murphy 2015; Holland 1982; see also seminal work on burnout by Freudenberger 1974; Maslach and Jackson 1981). It has three distinct symptoms: *exhaustion* that is characterized by a lack of emotional energy and a feeling of being strained and tired at work; *cynicism* consisting of detachment from work in general as well as from students, parents, or colleagues at work; and professional *inadequacy* consisting of a reduced sense of personal accomplishment at work (Brouwers and Tomic 2000; Hakanen et al. 2006; Maslach 2015; Maslach et al. 2001; meta-analysis by Montgomery and Rupp 2005; Schaufeli and Buunk 2003). In cases of full-blown burnout, all of these symptoms are experienced to a great extent (see Maslach et al. 2001).

Given that teachers work every day with both pupils and members of the professional community, social interrelations play a central role in teachers' work (Pyhältö et al. 2015). There is strong body of evidence showing that social interrelations can promote teachers' wellbeing (e.g., Berkovich and Eyal 2018; Hakanen et al. 2006). For instance, positive relationships with colleagues have been shown to buffer teacher stress (e.g., Richards et al. 2018). However, social interaction within the professional community and with pupils does not automatically increase teacher wellbeing. In fact, frictions in these interrelations might reduce teachers' wellbeing (Harmsen et al. 2018; Kyriacou 2001). For example, unresolved problems in social interrelations have shown to increase teacher's risk of developing burnout

symptoms (Gavish and Friedman 2010; Milfont et al. 2008; Santavirta et al. 2007; Sharplin et al. 2011; van Droogenbroeck et al. 2014). Research has shown that a poor sense of community and destructive friction in social interactions, with both pupils and colleagues, are related to teacher burnout (Aloe et al. 2014; Cano-Garcia et al. 2005; Dorman 2003; Gavish and Friedman 2010; Leung and Lee 2006). Different social relationships may have a different impact on the burnout symptoms experienced (Pietarinen et al. 2013b). For example, teachers' experiences of destructive friction and problematic encounters with pupils are shown to contribute to feelings of professional inadequacy, while destructive friction within the professional community is shown to be associated with cynicism (Pyhältö et al. 2011).

Although the central role played by social interaction in teacher wellbeing has been recognized (e.g., Hakanen et al. 2006; Volgast and Fischer 2016), the complexity and dynamics of the social working environments provided by the school have not been considered to the same extent in studies on teacher burnout (Devos et al. 2012; Parker et al. 2012) which is shown in the frequent use of decontextualized burnout measures. In order to catch the socially embedded nature of teachers' work, the measures used to explore teacher burnout should consider the social working environments provided by the school. Moreover, the social embeddedness of teacher burnout also means that the forms of experienced burnout may vary between schools, between the social working environments within a single school (see also Fernet et al. 2012; Kokkinos 2007; Skaalvik and Skaalvik 2009, 2017), and between the teachers.

There is some evidence that individual differences in burnout risk are related to gender, years of teaching experience, and grades being taught (e.g., Brewer and Shapard 2004; Klassen and Chiu 2010). For example, female teachers are more likely to experience higher levels of work stress and exhaustion than male teachers, who, in turn, are more prone to suffer from cynicism (Klassen and Chiu 2010; Skaalvik and Skaalvik 2017; see also meta-analysis by Purvanova and Muros 2010). Moreover, early career teachers seem to be more vulnerable to burnout than more experienced ones (Brewer and Shapard 2004). Also, variations between teacher groups have been detected: special education teachers are more likely to be at increased burnout risk compared with primary or subject teachers (see Soini et al. 2019).

Even though it has been acknowledged that some teachers may be at greater risk of developing certain burnout symptoms than others, studies on teacher burnout have traditionally relied on variable-based approaches instead of person-centered ones (Mäkikangas and Kinnunen 2016). However, interest in individual variations in teacher burnout experience in terms of teacher burnout profiles has grown recently (e.g., Tikkanen et al. 2017; Brudnik 2011; Mojsa-Kaja et al. 2015; systematic review by Mäkikangas and Kinnunen 2016). Earlier studies on teacher burnout profiles have mainly adopted two separate approaches: studies that concentrate solely on teachers' profiles in terms of work stress and burnout (e.g., Brudnik 2011) and studies that explore teacher profiles in which burnout is clustered with other wellbeing-related constructs, such as work engagement or coping behavior (e.g., Herman et al. 2018; Salmela-Aro et al. 2019). The studies focusing solely on individual differences in burnout experiences among teachers are rare. However, the findings of Mojsa-Kaja and others (Mojsa-Kaja et al. 2015), Brudnik (2011), as well as our recent findings (Tikkanen et al. 2017) imply that consistent and discrepant burnout profiles can be found among teaching professionals. Consistent profiles were characterized by systematically high, moderate, or low levels of all burnout symptoms, whereas teachers with discrepant profiles reported increased or high levels of one or two burnout symptoms. In their longitudinal study, Hultell and

others (2013) identified seven burnout trajectories: three stable (low, moderate, or high) and four changing trajectories of varying shapes. These studies on teachers' burnout exclusively indicate that typically two or three consistent profiles and up to four discrepant profiles can be identified.

Studies displaying a person-centered approach in which burnout is combined with other attributes (e.g., Herman et al. 2018; Salmela-Aro et al. 2019) are more common than those concentrating solely on burnout. Salmela-Aro and her colleagues (Salmela-Aro et al. 2019) and Timms and others (Timms et al. 2012) showed that some teachers experience burnout symptoms simultaneously with work engagement, whereas others experience mere work engagement or burnout symptoms. In turn, Bianchi and others (Bianchi et al. 2015) showed that burnout and depression symptoms clustered together suggesting an overlap between the concepts of burnout and depression. In their longitudinal study, Kanayama and others (Kanayama et al. 2016) focused on co-occurrence of burnout and collaboration among school personnel, and found out that there was an inverse relationship between collaboration and burnout. The study by Herman and his colleagues (Herman et al. 2018) showed four distinct patterns of teacher adjustment in terms of burnout, stress, coping, and self-efficacy, and concluded that coping behaviors distinguished the profiles characterized by high stress.

Taken together, research findings on teacher burnout profiles are not consistent, as the number of burnout profiles identified varied across the studies. Also, individual variations in the associations between burnout and other wellbeing-related constructs, such as coping and collaboration within professional community, have been detected (Herman et al. 2018; Kanayama et al. 2016). Accordingly, so far the results on teacher burnout profiles and factors contributing to the individual variation in this regard have been inconsistent. Teachers with different burnout profiles may utilize different strategies to deal with stressors and the effect of these strategies on teacher wellbeing may also vary between individuals. Hence, more studies utilizing a person-oriented approach to examine the individual variations and their determinants in teacher burnout are needed.

Proactive strategies for reducing burnout

When confronted with stressful situations, teachers can use a variety of strategies to deal with it. For instance, they can adapt to or ignore the challenges posed by the situation (Pietarinen et al. 2013a) to change the environment and/or manage their emotions (Arnold et al. 2010; Foley and Murphy 2015; see also seminal work of coping by Lazarus and Folkman 1984). Depending on the teachers and the situation, the strategies used can be more or less effective in solving the situation and buffering burnout (Kammeyer-Mueller et al. 2009; Klassen and Durksen 2014). Past research has focused heavily on teacher reactions when faced with stressful situation, that is, coping with stressors (e.g., Austin et al. 2005; Carmona et al. 2006; Grossi 1999; Gustems-Carnicer and Calderón 2013; Howard and Johnson 2004; Kieschke and Schaarschmidt 2008; Kyriacou 2001; Parker et al. 2012). However, teachers do not simply react to a certain stressor, they can also make an effort to deal with future stressors. Accordingly, they can utilize *proactive strategies* that aim to cope with immediate stressors being faced, and also to buffer potential stressors in advance by building and using resources at hand (Aspinwall and Taylor 1997; Schwarzer and Hallum 2008; Straud et al. 2015).

Proactive strategies can focus primarily on regulation of one's own behaviors and thoughts, (*self-regulation*), or on collaboration with others, (*co-regulation*), or both (Pietarinen et al. 2013a, Tikkanen et al. 2017, Väisänen et al. 2018). *Proactive self-regulation* entails regulation

of one's own behavior, cognition, and emotions such as slowing work pace, while *proactive co-regulation strategies* refer to building and modifying social resources intentionally such as asking for, providing, and receiving help from colleagues to deal with the potential stressor (Pietarinen et al. 2013a, Smith and Lev-Ari 2005, Tikkanen et al. 2017, Väisänen et al. 2018). It has been suggested that proactive strategies can be effective in reducing teacher burnout (Klassen and Durksen 2014; Pietarinen et al. 2013a). Klassen and Durksen (2014) have shown that proactive strategies, including being prepared, staying organized, and seeking help when needed, are related to lower levels of stress in teaching among novice teachers. There is also evidence that time management (goal setting, prioritizing, and planning) is an effective strategy in reducing burnout risk among teachers (Peeters and Rutte 2005). We recently showed that the proactive strategy use was associated with the reduced risk of student teacher burnout, particularly in terms of exhaustion and inadequacy being experienced (Väisänen et al. 2018). Proactive self-regulation has also been found to be related to lower risk of burnout among school principals (Tikkanen et al. 2017). Moreover, the use of self- and co-regulative proactive strategies has been associated with reduced experiences of exhaustion and a better working-environment fit among experienced teachers (Pietarinen et al. 2013a). The effects of the proactive strategies on the perceived working-environment fit were mediated by reduced exhaustion and cynicism towards the teacher community. Moreover, the use of co-regulative strategies was associated with reduced levels of cynicism and inadequacy, whereas self-regulative strategies were only effective in reducing teacher exhaustion. In turn, a lack of reciprocity in social relationships at work has been found to be related to increased levels of experienced burnout among teachers (Bakker et al. 2000). However, prior knowledge of the association between teacher burnout profiles and proactive strategy use is less than sufficient.

Aim of the study

The aim of this study is to gain a better understanding of the individual differences in experiences of socio-contextual burnout among in-service teachers by analyzing burnout risk profiles¹ among Finnish comprehensive school teachers, and the proactive strategies they use to manage stressful transactions in their work. Therefore, the differences between the socio-contextual burnout profiles, in terms of proactive strategy use, i.e., self- and co-regulation strategies, were examined. In addition, the associations between background variables (i.e., gender, years of experience, and teacher domain) and socio-contextual burnout profiles were analyzed. The following general hypotheses were formulated based on earlier research:

H1: Different teacher profiles in terms of experienced socio-contextual burnout, consisting of exhaustion, cynicism towards the professional community, and inadequacy in teacher-pupil interaction, can be detected (Brudnik 2011; Mäkikangas and Kinnunen 2016). Based on earlier research on teachers' burnout profiles, we expect to identify several burnout profiles, two or three of which will be consistent ones, i.e., displaying systematically low, moderate, or high levels of all burnout symptoms (Brudnik 2011; Mojsa-Kaja et al. 2015; Tikkanen et al. 2017). In addition to these two or three consistent profiles, up to four discrepant burnout profiles with varying emphases on exhaustion, cynicism, and inadequacy could be found (Brudnik, 2011; Mojsa-Kaja et al. 2015; Tikkanen et al. 2017). These could be characterized either by high levels of inadequacy, high on exhaustion, or high on both exhaustion and cynicism.

¹ It is important to note that the aim is not to diagnose burnout or develop any diagnosis standards of teacher burnout, but to explore the individual differences there are among in-service teachers at risk of burnout.

H2: Teachers with the different profiles differ from each other in terms of reported use of proactive strategies (Aspinwall and Taylor 1997; Schwarzer and Hallum 2008; Straud et al. 2015).

H3: Proactive strategy use is likely to be associated with reduced burnout risk (Pietarinen et al. 2013a, Tikkanen et al. 2017). However, the function of self- and co-regulative strategies in reducing experienced socio-contextual burnout varies (Tikkanen et al. 2017, Väisänen et al. 2018) across the profiles.

H4: Gender, teacher domain (i.e., primary, subject, or special education teacher), and years of teaching experience are likely to be associated with burnout risk (e.g., Brewer and Shapard 2004; Skaalvik and Skaalvik 2017).

Method

Research context

All Finnish comprehensive school teachers have a master's degree in either educational science or another domain, such as mathematics or biology, with compulsory additional studies (35 credits) in educational science. Primary school teachers, who typically work in grades (0²)1–6, hold an MA degree in educational science, with the main subject being applied educational science or educational psychology, while subject teachers, who typically teach in grades 7–9 (lower secondary school), usually have an MA in a certain subject with an additional compulsory year of study in educational science. Special education teachers who teach in both primary and secondary schools in grades (0²)1–9 have an MA in educational science, with the main subject being special education. Flexible accountability structures are in place that emphasize trust in individual school autonomy (Aho et al. 2006).

Participants

In 2010, 2310 in-service school teachers, including primary ($n = 815$; 35%), subject ($n = 727$; 32%), and special education teachers ($n = 760$; 33%), completed a survey. A probability sampling method ($N = 6000$) was used. The sample was taken from the teacher register held by the Trade Union of Education in Finland (95% of Finnish teachers are members of the Union) and data were collected via a paper survey sent to teachers' home address by mail with a return envelope. The total response rate was 39%. All respondents had an MA degree, and all were at various stages of their careers. The specified non-response analysis showed that the sample representation was plausible. The mean age of the respondents was 45.3 years ($SD = 9.84$; min/max, 25/68 years). In terms of age and grades taught, the sample was also representative of the Finnish teacher population (see also National Board of Education 2010). The majority of the respondents were women ($n = 1876$) and the minority men ($n = 428$). Accordingly, female teachers were slightly over-represented in the sample. Respondents' average work experience in the teaching profession was 17.3 years ($SD = 9.90$; range 1–45). Participation in the study was voluntary. The participants were informed of the purpose of the study, the use and storage of the data, and their rights as participants in a cover letter relating to the survey. Also, contact details of the research group were provided in case participants

² Grade 0 refers to pre-primary education provided the year preceding the start of comprehensive school.

wanted more information about the project. No incentives were used to encourage participation. The study did not require an ethics review in Finland (cf. Finnish Advisory Board for Research Integrity 2009).

Measures

The authors developed two scales for measuring teachers' socio-contextual burnout (9 items) and proactive strategies (7 items) (Pietarinen et al. 2013b; see the Appendix). The Socio-Contextual Teacher Burnout Scale draws on Maslach and Jackson's (1981) burnout scale. The exhaustion component includes the Elo et al. (2003) single-item stress scale. The socio-contextual burnout scale was constructed by specifying the social contexts of cynicism and inadequacy (Pyhältö et al. 2011), and consists of 9 items measuring three factors of socio-contextual teacher burnout: (a) exhaustion (3 items), (b) cynicism towards the teaching community (3 items), and (c) inadequacy in teacher-pupil interaction (3 items) (Pietarinen et al. 2013b).

The Proactive Strategy scale (see the Appendix) was based on research evidence showing that functional strategies for reducing exhaustion can be adopted in teachers' everyday routines (Pyhältö et al. 2011; Salmela-Aro 2009). The scale consists of 7 items, measuring two factors of proactive strategies: a) self-regulation (4 items) and b) co-regulation (3 items).

The validity and reliability of the Socio-Contextual Teacher Burnout Scale and the Proactive Strategy Scale have been examined and supported in prior studies (Pietarinen et al. 2013a, b). All items were rated on a 7-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree) (except for the stress item that was rated on a 10-point scale). Mean variables were formed to represent the different components of teacher burnout and proactive strategies. The Cronbach alpha reliability and descriptive statistics of the subscales are displayed in Table 1.

Statistical analysis

Latent profile analysis (LPA) was utilized in order to explore burnout risk profiles that may emphasize different components of socio-contextual teacher burnout risk, that is, exhaustion, cynicism towards the professional community, and inadequacy in teacher-pupil interaction. LPA served our purpose of examining the individual variation and distinct profiles of burnout risk in teachers and offered statistical criteria for model comparisons in selecting the best-fitting number of latent classes in comparison with other clustering approaches (Meyer et al. 2013).

LPA involved grouping individuals into latent classes based on their observed response pattern on specific variables (Berlin et al. 2014). All the analyses were conducted using Mplus (version 7.4; Muthén and Muthén 1998–2015). The robust maximum likelihood (RML) estimator was used, as it produces robust standard errors and chi-square statistics to handle non-normally distributed data. There were few missing values in the data so the analysis was mostly based on complete cases; nevertheless, the full information estimation was applied.

Model building strategy The analysis followed the three-step method for identifying profiles and examining the covariates of latent profile membership (Asparouhov and

Muthén 2014). First, latent burnout profiles were extracted without covariates. The indicator variables, that is, the mean variables of experienced exhaustion, cynicism, and inadequacy, were allowed to correlate with each other, and the extraction of latent classes was based on variable means, maximizing the within-class homogeneity and between-class heterogeneity. Within-class variances and correlations were held constant across classes for parsimony and to avoid convergence problems (Berlin et al. 2014). The teachers were assigned a posterior probability of being a member in each latent class identified by the LPA model.

The two other steps concerned the relationship between covariates and latent burnout profiles. The second step assigned each individual teacher the most likely class membership based on the posterior probabilities obtained in the first step. In the final third step, the mean variables of self- and co-regulative strategies were included as antecedents of the latent class variable while accounting for the measurement error in classification in the second step (Asparouhov and Muthén 2014). These final steps were conducted using the R3STEP procedure of Mplus with the proactive strategies as auxiliary variables (Muthén and Muthén 1998–2015). The R3STEP procedure performs a multinomial logistic regression and provides the odds ratios describing the effect of proactive strategies on the likelihood of membership in each of the latent profiles compared with other profiles. Finally, three background covariates were included in the model as auxiliary variables in order to examine whether teacher domain (primary/subject/special education), gender, or teaching experience has an effect on the membership of burnout risk profiles.

The 3-step approach offers a clear and more readily interpretable latent class model in the first step than a single-step approach, and statistically sound estimates for covariate effects in the final steps (see Asparouhov and Muthén 2014; for discussion on alternative approaches, see Clark and Muthén 2009).

Evaluating model fit The first step of the analysis includes identifying the model with the number of latent profiles that best describes the data. Multiple LPAs were run with 1–7 classes (see Table 2 for LPA models with 1–6 classes). Several statistical fit indices as well as the content criterion were applied to determine the most appropriate number of latent profiles (see Bauer and Curran 2003; Muthén 2003; Nylund et al. 2007). The Akaike (AIC), Bayesian (BIC), and adjusted Bayesian (aBIC) information criteria were employed to test the goodness-of-fit of the model with the data, with lower values indicating a better fit. The BIC and aBIC are adjusted for sample size and improve when the sample size increases (Nylund et al. 2007), and thus, provided the most useful information criteria for our purposes.

Entropy value and latent class probabilities were used to evaluate the statistical accuracy of assigning people to profiles. Both vary between 0 and 1, with values close to 1 indicating a

Table 1 Reliability and descriptive statistics of the burnout and proactive strategies scales

Scale	No. of items	Alpha	<i>N</i>	Mean	SD	Min	Max
Exhaustion	3	.82	2310	3.31	1.76	1.00	9.00
Inadequacy	3	.73	2309	2.82	1.26	1.00	7.00
Cynicism	3	.78	2308	2.97	1.42	1.00	7.00
Self-regulation	4	.84	2307	5.12	1.07	1.00	7.00
Co-regulation	3	.61	2307	5.22	0.89	1.67	7.00

higher degree of accuracy. The entropy value describes the overall accuracy whereas latent class probabilities describe the accuracy of the classification for each class separately.

The subsequent models were also compared with the Vuong-Lo-Mendell-Rubin (VLMR) likelihood ratio test, the Lo-Mendell-Rubin adjusted likelihood ratio test (aLRT), and the bootstrapped likelihood ratio test (BLRT). A statistically significant test result ($p < 0.05$) indicates that the model with k classes fits the data better than the model with one latent class less, that is, $k-1$ classes.

Results

Determining the number of latent classes

The information criteria (AIC, BIC, aBIC) showed that adding a new latent class enhanced the model fit all the way to 6 classes, suggesting that at least 6 separate classes could be distinguished from the data.

According to the entropy values, the accuracy increased until the 5-class model, after which it displayed a decrease. The entropy values were close to or above 0.80, which can be considered high (Clark and Muthén 2009). Moreover, the latent class probabilities stayed high (close to 0.80) for all classes up to the 5-class model and decreased slightly for the 6-class model (see Table 2).

Statistically significant test results on the VLMR and aLRT indicated that the five-class model fit the data better than the model with four latent classes. In fact, adding the sixth class into the model did not result in a statistically significant improvement in fit.

Based on the statistical criteria, most of the LPA models we tested would have been acceptable. The VLMR and aLRT tests gave the clearest indication of the five-class model having better model fit than the models with fewer or more latent classes. We selected the 5-class model as it showed the best balance between parsimony (fewer classes) and subtleness of dividing the data into more classes. The 5-class model also had the highest entropy value indicating a high accuracy of class memberships, which was favorable for the subsequent analysis with covariates. In addition, the separation of latent profiles was validated with the analysis of variance (see Table 3). In terms of content, this model provided the most comprehensive insight into the teachers' socio-contextual burnout, by highlighting the varying emphases on different symptoms. Hence, the final model comprised five latent profiles of the teachers' socio-contextual burnout.

Profiles of teachers' socio-contextual burnout risk

The model with five latent profiles of the teachers' socio-contextual burnout risk achieved the best fit with the data. The five profiles are shown in Fig. 1.

The first latent profile culled from our analysis was *No burnout risk*. It was the most common profile among the teachers, with a 47% sample share. Teachers belonging to the *No burnout risk* profile displayed low levels of exhaustion, inadequacy in teacher-pupil relationship, and cynicism towards the professional community. The levels were statistically significantly lower than those in the other profiles (see Table 3). Hence, the teachers within this profile showed no risk of experiencing burnout.

The second profile, the *Minor burnout risk*, presented one-quarter (25%) of the teachers in the sample. The *Minor burnout risk* profile holders showed they experienced moderate levels

Table 2 Fit indices and class frequencies for latent profile analyses (LPA) with different numbers of latent classes

No. of classes	LogL (mf)	AIC	BIC	aBIC	Entropy	Latent class probabilities	VLMR (p value)	aLRT (p value)	BLRT (p value)	Class counts (most likely/posterior) ^a
1	-11,949.32 (9)	23,916.65	23,968.35	23,939.76	N/A	1.000	N/A	N/A	N/A	2310/2310
2	-11,728.72 (13)	23,483.44	23,558.13	23,516.83	0.796	0.96, 0.91	0.0000	0.0000	0.0000	1614, 696/1621, 689
3	-11,634.43 (17)	23,302.86	23,400.52	23,346.51	0.796	0.95, 0.83, 0.89	0.0000	0.0000	0.0000	1313, 651, 346/1314, 660, 336
4	-11,584.71 (21)	23,211.43	23,332.07	23,265.35	0.810	0.94, 0.84, 0.83, 0.89	0.0021	0.0025	0.0000	1096, 582, 437, 196/1116, 553, 453, 188
5	-11,548.15 (25)	23,146.29	23,289.92	23,210.49	0.816	0.94, 0.84, 0.83, 0.82, 0.76	0.0322	0.0353	0.0000	1091, 573, 430, 130, 86/1116, 541, 448, 126, 79
6	-11,510.49 (29)	23,078.97	23,245.58	23,153.44	0.759	0.90, 0.74, 0.79, 0.75, 0.79, 0.86	0.0949	0.1017	0.0000	985, 438, 256, 251, 242, 137/1016, 437, 249, 241, 232, 135

LogL log likelihood value, *mf* number of free parameters, *AIC* Akaike information criterion, *BIC* Bayesian information criterion, *aBIC* adjusted Bayesian information criterion, *VLMR* Vuong-Lo-Mendell-Rubin likelihood ratio test, *aLRT* Lo-Mendell-Rubin adjusted likelihood ratio test, *BLRT* bootstrapped likelihood ratio test. The selected model is in italics

^a Final class counts based on estimated posterior probabilities (before slash) and based on individuals' most likely latent class membership. *N* is 2310

of exhaustion, inadequacy in teacher-pupil interaction, and cynicism towards the professional community. To some extent, teachers within this profile had an increased risk of developing burnout, especially as the exhaustion, inadequacy in teacher-pupil interaction, and cynicism towards the professional community seemed to occur with slightly increased levels simultaneously.

The third profile, the *Increased exhaustion* profile, represented 19% of the teachers in our sample. The *Increased exhaustion* profile holders showed high levels of exhaustion together with moderate levels of inadequacy in teacher-pupil interaction and cynicism towards the professional community. The teachers displaying the *Increased exhaustion* profile had increased risk of burnout, as reporting high levels of exhaustion, but did not yet experience increased sense of inadequacy in terms of teacher-pupil interaction or cynical attitudes towards the professional community. The *Increased exhaustion* and the *Minor burnout risk* had similar profile shapes, but the former showed a radically higher exhaustion level (see Table 3).

The fourth risk profile, the *Increased exhaustion and cynicism*, was presented by 6% of the teachers. Teachers with this profile showed high levels of exhaustion and moderate levels of cynicism towards the professional community, combined with low levels of inadequacy in teacher-pupil relationships.

The *High burnout risk* profile was least commonly detected among teachers. Only 4% of the teachers fell into this profile. Teachers belonging to this profile showed the highest levels of exhaustion and inadequacy in terms of teacher-pupil relationships, with moderate levels of cynicism towards the professional community (see Fig. 1).

In general, the profiles detected differed from each other in terms of all burnout symptoms, i.e., levels of exhaustion, inadequacy, and cynicism experienced. The greatest variation was in the exhaustion experienced, ranging from very low to very high levels. The profiles differed from each other in terms of exhaustion, except for the *Increased exhaustion and cynicism* and *High burnout risk* profiles (see Table 3). The levels of inadequacy varied mostly between low and moderate, only the *High burnout risk* profile showing a high level of inadequacy. All profiles differed statistically significantly from each other in inadequacy (see Table 3). In turn, none of the profiles showed high levels of cynicism towards the professional community, though the profiles with moderate or low levels of cynicism were clearly distinguishable (only the *Increased exhaustion and cynicism* and *High burnout risk* profiles showing a similar level, as for exhaustion; see Table 3).

Table 3 Means (and standard deviations in parentheses) for teacher socio-contextual burnout symptoms and proactive strategies in latent profiles of teacher burnout

	No burnout risk	Minor burnout risk	Increased exhaustion	Increased exhaustion and cynicism	High burnout risk
Exhaustion	1.82 (0.56)	3.51 (0.60)	5.10 (0.60)	6.65 (0.66) ^a	6.81 (0.66) ^a
Inadequacy	2.27 (0.97)	3.12 (1.16)	3.38 (1.22)	2.70 (1.05)	5.10 (1.09)
Cynicism	2.51 (1.26)	3.08 (1.29)	3.42 (1.36)	4.24 (1.56) ^a	4.00 (1.53) ^a
Self-regulation	5.62 (0.85)	4.93 (0.90)	4.60 (1.00)	4.09 (1.21) ^a	3.85 (1.09) ^a
Co-regulation	5.48 (0.79)	5.13 (0.83) ^b	5.00 (0.88) ^b	4.70 (1.00) ^a	4.37 (1.08) ^a

One-way analysis of variance with post hoc comparisons assuming unequal variances between groups was used for examining the mean differences between latent profiles. Matching superscript letters after the statistics indicate which group means were similar and did not display statistically significant differences. All other differences in group means were statistically significant at $p < .05$ level

Proactive strategies as antecedents of socio-contextual burnout profiles

The results showed that the teachers had developed skills for buffering work-related stressors, through proactive strategies. Teachers within the different profiles typically reported either a stronger emphasis on co-regulative strategies or a similar emphasis in self- and co-regulated strategy use (see Table 3). More specifically, the self- and co-regulation skills were high in the *No burnout risk* and *Minor burnout risk* profiles, and especially low in the *High burnout risk* and *Increased exhaustion and cynicism* profiles (see Table 3). Moreover, it seemed that the intensive use of the co- and self-regulation skills decreased regularly along the increased levels of the experienced burnout symptoms, especially in terms of the exhaustion experienced and cynicism towards the professional community. Further investigation showed that most of the differences in proactive strategy use were statistically significant between the profiles (see Table 3). Accordingly, multinomial logistic regression was carried out in order to examine how proactive strategy use was related to the membership in different latent profiles of burnout (see Table 4).

Table 4 shows that teachers displaying strong proactive strategy use in both self- and co-regulation (high odds ratios above 1.0 with p value $< .05$) had the highest odds of belonging to the *No burnout risk* profile, as opposed to the *High burnout risk* profile. A similar pattern is visible for the differences between the *No burnout risk* profile and the two other profiles as well, that is, *Minor burnout risk* and *Increased exhaustion*. Self-regulative strategy was a stronger antecedent with higher odds than the co-regulative strategy in these comparisons.

A more pronounced effect of self-regulation skills is seen when using the *Increased exhaustion and cynicism* profile as a reference profile: Self-regulation strategy use was associated with the profile membership whereas co-regulation skills were not a statistically significant antecedent of profile membership (see Table 4). The better the teachers' self-regulation skills, the higher their odds of belonging to the *No burnout risk*, *Minor burnout risk*, or *Increased exhaustion* profile than to the *Increased exhaustion and cynicism* profile. A

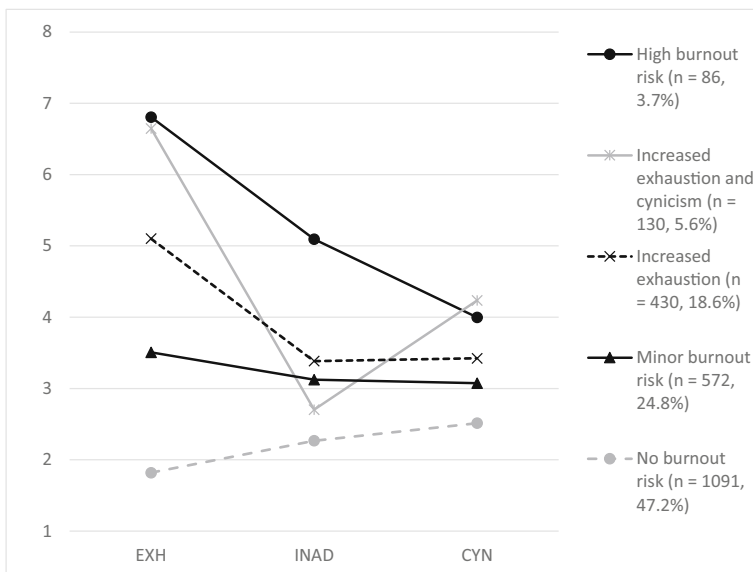


Fig. 1 Profiles of teachers' socio-contextual burnout

similar effect was detected for the *Minor burnout risk* profile as opposed to the *Increased exhaustion* profile.

Moreover, teachers with a strong emphasis on proactive strategy use were also more likely to fall into the *Minor burnout risk* or *Increased exhaustion* profile than to display a *High burnout risk* profile. A new pattern emerged for these two profiles: While both proactive strategies were statistically significant antecedents of membership, the co-regulation skills were a stronger antecedent than self-regulation skills.

Finally, the proactive strategy use did not differentiate the *Increased exhaustion and cynicism* profile and the *High burnout risk* profile. The reason for this might be that both profiles show high exhaustion and moderate cynicism levels, and also similar lower levels of self- and co-regulation skills (see Table 3).

The *High burnout risk* and *Increased Exhaustion and cynicism* profiles exhibited the lowest frequency of self- and co-regulative strategy use (see Table 3 for means). More specifically, showing lower levels of self- and co-regulated strategy use was also related to a teacher's odds of exhibiting either one of these two profiles including experiencing several burnout symptoms compared to the three profiles in which no symptoms or purely exhaustion at different levels were experienced. Furthermore, it seemed that the self-regulation is an effective strategy in terms of buffering the exhaustion, but not a sufficient strategy for avoiding the expansion of the exhaustion to the experienced inadequacy in teacher-pupil relationships and cynicism towards the professional community. All in all, the results indicated that well-developed proactive strategies, both in terms of self- and co-regulative strategies, protect teachers from experiencing socio-contextual burnout.

Effects of gender, teaching experience, and teacher domain on burnout risk profiles

The relationship between background variables, that is, gender, teaching experience, and teacher domain, and the teacher burnout profiles was examined using the multinomial logistic regression within R3STEP procedure. Gender did not have statistically significant relation with burnout profiles.

Teachers with more teaching experience had higher odds (OR = 1.04, 95% CI 1.01–1.08; $p = .021$) of belonging to the *No burnout risk* profile than to the *High burnout risk* profile. Also, they were more likely (OR = 1.01, 95% CI 1.00–1.03; $p = .048$) to have the *No burnout risk* profile as opposed to the *Increased exhaustion* profile.

In comparison with primary and subject teachers, special education teachers more probably (OR = 2.53, 95% CI 1.25–5.21; $p = .010$) belonged to the *Increased exhaustion and cynicism* profile than to the *Increased exhaustion* profile.

Discussion

While the majority of teachers did not suffer from an increased risk of burnout, a number of teachers displayed high levels of exhaustion and inadequacy, and even increased levels of cynicism. That is, nearly half the teachers in the sample displayed increased burnout risk. As educational professionals are frequently shown to experience high levels of work stress (Heus and Diekstra 1999; Perkiö-Mäkelä 2009), the number of teachers displaying increased risk of burnout is not surprising. However, it is thought-provoking. As our aim was not to diagnose burnout among teachers, the profiles need to be interpreted in relation to each other. For example, teachers in the *Increased exhaustion* profile experienced significantly more exhaustion than teachers within *Minor burnout*

Table 4 Odds ratios with 95% confidence interval for the effects of self-regulative and co-regulative strategies on teacher burnout profile membership

Burnout profile	Odds ratio	LL 2.5%	UL 2.5%
Reference profile: <i>High burnout risk</i>			
<i>No burnout risk</i>			
Self-regulation	6.265***	3.793	10.348
Co-regulation	3.554**	1.687	7.484
<i>Minor burnout risk</i>			
Self-regulation	2.404***	1.487	3.885
Co-regulation	2.863**	1.373	5.972
<i>Increased exhaustion</i>			
Self-regulation	1.859*	1.137	3.040
Co-regulation	2.804**	1.313	5.987
<i>Increased exhaustion and cynicism</i>			
Self-regulation	1.092	0.556	2.143
Co-regulation	2.411	0.851	6.826
Reference profile: <i>Increased exhaustion and cynicism</i>			
<i>No burnout risk</i>			
Self-regulation	5.743***	3.973	8.302
Co-regulation	1.474	0.926	2.346
<i>Minor burnout risk</i>			
Self-regulation	2.203***	1.564	3.105
Co-regulation	1.188	0.749	1.882
<i>Increased exhaustion</i>			
Self-regulation	1.704**	1.188	2.444
Co-regulation	1.163	0.715	1.891
Reference profile: <i>Increased exhaustion</i>			
<i>No burnout risk</i>			
Self-regulation	3.370***	2.825	4.020
Co-regulation	1.267*	1.056	1.521
<i>Minor burnout risk</i>			
Self-regulation	1.293**	1.092	1.530
Co-regulation	1.021	0.826	1.262
Reference profile: <i>Minor burnout risk</i>			
<i>No burnout risk</i>			
Self-regulation	2.606***	2.189	3.103
Co-regulation	1.241*	1.044	1.475

LL lower limit of the confidence interval, UL upper limit

* $p < .05$; ** $p < .01$; *** $p < .001$

risk. However, this does not mean that those teachers with the former profile fulfill clinical criteria of being burnt out, but that they do entertain increased risk of developing it. Still, the large number of teachers with increased or high risk of burnout is an alarming finding especially when taking into account the crucial role of teachers' wellbeing in pupils' learning (Herman et al. 2018; Klusmann 2008).

The results also showed that there was considerable variation in burnout risk among in-service teachers. Five distinct socio-contextual burnout profiles were identified, including *No burnout risk*, *Minor burnout risk*, *Increased exhaustion*, *Increased exhaustion and cynicism*, and *High burnout risk* profiles. Accordingly, the first hypothesis was supported by the findings. Three of the burnout profiles were considered consistent, i.e., displaying systematically either low, moderate, or high levels of all burnout symptoms (namely *No burnout risk*, *Minor burnout risk*, and *High burnout risk* profiles) and two discrepant profiles, reporting increased or high levels in one or two symptoms (*Increased exhaustion* and *Increased exhaustion and cynicism*). These findings were in line with

previous studies on teacher burnout profiles (Brudnik, 2011; Mojsa-Kaja et al. 2015; Tikkanen et al. 2017). However, the results expand the previous research on teacher burnout profiles by showing more fine-grained socio-contextualized differences in teacher burnout profiles, in terms of the levels of general work-related exhaustion, cynicism towards the professional community, and experienced inadequacy in teacher-pupil interactions. The results imply that there is variation in the primary sources of burnout among in-service teachers: some of the teachers seem to experience interaction in a professional community as being especially burdensome, while for others, the general work overload seemed to be the dominant stressor.

The results showed that the teacher burnout profiles differed from each other primarily in terms of the exhaustion experienced. Yet, those teachers who suffered from high levels of exhaustion also tended to suffer from cynicism towards the professional community. A reason for this alignment of experienced exhaustion and cynicism across the profiles may be that exhaustion decreases the toleration of negotiating the different, or even contradictory, professional views and affairs in the professional community. This may further trigger alienation from colleagues and eventually lead to experiencing cynicism towards the professional community (see also Pietarinen et al. 2013a). The results also showed that inadequacy in terms of teacher-pupil interaction was less systematically aligned with exhaustion and cynicism within the teacher burnout profiles. This may imply that inadequacy in teacher-pupil interaction develops somewhat independently from general work-related exhaustion and cynicism towards the professional community (see Maslach and Leiter 2008; Skaalvik and Skaalvik 2017). The results also imply that exhaustion is a crucial determinant triggering teacher burnout risk, and further, had the most significant variation in the different teacher burnout profiles in the sample.

Our study contributes to the literature on teachers' socio-contextual burnout prevention (Pyhältö et al. 2011, Pietarinen et al. 2013a) by being one of the first studies to explore the function of proactive strategy use in reducing teacher burnout. The results showed that the teachers with different burnout profiles typically reported quite high levels of proactive strategy use in buffering work-related stressors. Moreover, the high level of use of both self- and co-regulative strategies was related to lower risk of experiencing socio-contextual burnout. This implies that utilizing *proactive strategies* (Pietarinen et al. 2013a; Straud et al. 2015) that not only aim to cope with immediate stressors, but also to buffer potential stressors in advance by building and using resources, is a functional way to prevent teacher burnout. However, differences between the burnout profiles, in terms of proactive strategy use, also occurred, suggesting that there could be individual variations in the effect of proactive strategies on burnout symptoms (see also Herman et al. 2018; Kanayama et al. 2016). Reporting high levels of proactive strategy use was related to a high probability in belonging to the *No burnout risk* or *Minor burnout risk* profiles, compared with other less favorable profiles. Moreover, the results suggested that self- and co-regulative strategy use played partly different functions. Self-regulative strategies were particularly associated with reduced risk of experiencing exhaustion, whereas employing both strong self- and co-regulative strategies and co-regulation-dominated strategies was related to decreased risk of experiencing all the socio-contextual burnout symptoms. This implies that a balanced combination of self- and co-regulative strategies and co-regulation-dominated strategies can be effective in reducing teacher burnout, whereas the role of self-regulation is more ambiguous. The results imply that self-regulation provides an effective strategy in buffering exhaustion, but it is not by itself a sufficient strategy for avoiding the burnout syndrome. Hence, our second and third hypotheses were partly supported.

The results imply that the utilization of mere self-regulation strategies was related to increased risk of experiencing cynicism or inadequacy at work. An explanation may be that if a teacher experiences a mismatch between themselves and professional community or

constantly experiences failures in teacher-pupil interaction, they are likely to distance themselves from the primary arenas of teacher's work. Thus, when facing or anticipating stressors, they are more inclined to employ a high degree of self-regulation than co-regulation, for instance. However, the balanced use of both self and co-regulative strategies would provide a more effective way to buffer all burnout symptoms, and further, renewing the constructive match between the teachers and working environment. Accordingly, further studies, particularly longitudinal person-oriented studies on proactive regulation strategies, are needed to test these assumptions.

Our results indicated that burnout risk was related to background variables, i.e., teaching experience and teacher domain. The more years of teaching experience a teacher had, the lower the burnout risk was. In addition, special education teachers seemed to be at higher risk of burnout, especially in terms of increased cynicism, compared with primary and subject teachers. However, no differences in burnout risk were identified between female and male teachers. Thus, our fourth hypothesis was partly supported.

Practical implications

The results revealed that nearly half the teachers in our sample demonstrated an indicative risk of burnout. This implies that more attention should be paid to teachers' wellbeing. Teachers' working conditions should be considered from the perspective of teachers' wellbeing (Herman et al. 2018). Facilitating the learning of proactive strategies, including both self- and co-regulative strategies among in-service teachers, has a significant potential for preventing teacher burnout. Results showed that the utilization of proactive strategies was related to lower burnout risk among the teachers, although the strategies had distinctively different roles in it. This implies that these strategies constitute a different set of skills and therefore require a different kind of learning. As early career teachers seemed to have higher burnout risk compared with more experienced teachers, the findings have significant implications for teacher education: both self- and co-regulative skills need to be not only acknowledged but also built as a part of becoming a competent teacher both in pre-service and in-service teacher education. In particular, learning to regulate one's actions, particularly with others, is a demanding skill that calls for intentionally constructed learning situations in which teachers and teacher students can try out and experience co-regulation.

Our results showed that both the in-service teachers' risk of experiencing burnout and the dominant symptoms experienced varied. This implies that it would be important to identify teachers at risk at the earliest possible stages of symptom onset. In addition, the means of relieving work overload should be adapted according to the dominant symptom(s). For example, effective methods to ease experienced exhaustion are likely to be different from functional means to reduce experienced cynicism towards the teacher community and/or inadequacy in teacher-pupil interaction. To buffer burnout effectively, it is crucial not only to identify the individual causes of stress but also attempt to find incisive ways to support teachers in avoiding full-blown burnout. It is also important to acknowledge that methods that support individual wellbeing may be collective in nature and require measures at the level of the teacher community.

Methodological limitations

In this study, the person-oriented methodological approach was utilized. The approach made it possible to account for the inter-individual variation by extracting latent burnout profiles among Finnish teachers. Along with the advantages of model-based

estimation and multitude of statistical criteria for model selection, mixture modeling still includes issues of selecting the most appropriate number of latent classes as well as convergence issues in estimation (Berlin et al. 2014). Convergence issues were avoided by keeping the model simple enough. As recommended in the literature (Asparouhov and Muthén 2014), we used the three-step approach to analyze the effects of the proactive strategies as exogenous covariates of burnout profiles. It is not suggested that the effects of proactive strategies are causal in nature, due to the cross-sectional design of the study. However, the results revealed the dynamic interplay between the proactive strategies adopted by teachers and the experienced burnout symptoms.

Even though the study's response rate was moderate, the representativeness of the sample was acceptable (see also Pietarinen et al. 2013b). Earlier studies have shown that, particularly when a probability sampling method is utilized, the representativeness of the sample is a more important criterion for evaluating the validity of the study than the response rate (Krosnick 1999; Cook et al. 2000). The data contained cases with complete records to except few, and hence, did not contain systematic data loss patterns. The respondents also used the whole item scale and the data did not include outliers. The majority of the respondents were women and they were slightly over-represented in the sample.

Although the construct validity of the scales used in this cross-sectional study was adequate, further construct validation of the scales introduced in the study is needed (see also Pietarinen et al. 2013b). The validity and reliability of the co- and self-regulative strategy measures could be increased by constructing additional items for both subscales. The co-regulation subscale particularly requires further refinement. The developed burnout scale sufficiently specified the social contexts of experienced cynicism and inadequacy in teachers' work and general exhaustion.

The scales developed made it possible to differentiate the teacher profiles in terms of burnout symptoms typical in the teaching profession. However, the validity of the measures could be increased by exploiting the instruments in other educational contexts and with larger data sets. Furthermore, longitudinal studies are needed to strengthen the consistency of the developed scales and to understand how these novel teacher profiles that seem to be associated with the proactive strategies adopted by teachers develop and evolve over time.

Conclusions

The results showed that nearly half the teachers in our sample demonstrated different combinations of burnout symptoms, and hence were an indicative risk of gradually proceeding burnout. However, considerable variation among in-service teachers, in terms of their risk of experiencing burnout, was detected. Five latent socio-contextual burnout profiles were identified. Proactive strategies, both in terms of self- and co-regulative strategies, protect teachers from experiencing socio-contextual burnout.

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Appendix. The scales and items of teacher burnout and proactive strategies (translated from Finnish)

Scales and items*

Socio-contextual teacher burnout inventory (STBI)

Exhaustion (EXH) (3 items)

Exh11: Stress means a situation in which a person feels tense, restless, nervous or anxious or is unable to sleep at night because his/her mind is troubled all the time. Do you feel this kind of work-related stress?¹

Exh12: I feel burnt out.

Exh13: With this work pace I don't think I'll make it to the retiring age.

Cynicism towards the teacher community (CYN) (3 items)

Cyn21: I'm disappointed in our teacher community's ways of handling our shared affairs.

Cyn22: In spite of several efforts to develop the working habits of our teacher community they haven't really changed.

Cyn23: I often feel like an outsider in my work community.

Inadequacy in teacher-pupil interaction (INAD) (3 items)

Inad31: The challenging pupils make me question my abilities as a teacher.

Inad32: I often feel I have failed in my work with pupils.

Inad33: Dealing with problem situations considering my pupils often upsets me.

Proactive strategies for reducing teachers' socio-contextual burnout symptoms

Self-regulation (SREG) (4 items)

Stra11: I'm able to control my work pace in the busy school work schedule.

Stra12: I can set limits to my work assignments.

Stra13: I know when it's time for me to adjust my work pace.

Stra14: It's possible to learn to adjust the way you manage your work strain.

Co-regulation (CREG) (3 items)

Stra21: I'm able to support the colleagues who feel strain in their work.

Stra22: I'm asking my colleagues for support when facing exhausting work situations.

Stra23: I'm getting better and better in recognizing the situations in which I have succeeded as a teacher.

*The item scale: *completely disagree*—1 2 3 4 5 6 7—*completely agree*. ¹ Except for the item Exh11 that was measured on a 10-point scale from 1 = *not at all* to 10 = *very much*

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