



Differences in Teacher Burnout Between Schools: Exploring the Effect of Proactive Strategies on Burnout Trajectories

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Differences in teacher burnout between schools are likely to occur due to differences in the quantity and quality of interaction within the schools. Multilevel latent growth curve analyses of burnout symptoms were performed on three-wave longitudinal data collected from 2,619 teachers in 75 schools in Finland. The results showed that differences in teacher burnout between schools were pronounced in cynicism, followed by emotional exhaustion. Organizational factors were not strong predictors of differences in teacher burnout. Proactive co-regulation strategies were related to lower levels of teachers' cynicism about the professional community, implying that they might be useful in preventing the teachers' cynicism at the school level.

Keywords: multilevel modeling, proactive co-regulation strategies, school community, teachers, teacher burnout

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INTRODUCTION

Teacher burnout has been recognized as a significant problem worldwide (Akça and Yaman, 2010; García-Carmona et al., 2018). A recent report showed that up to one-third of Finnish teachers experience high levels of work-related stress (Länsikallio et al., 2018), implying high risk of developing burnout. Teacher burnout has been shown to have negative effects for both the individual and the school community, including depression symptoms, poor quality sleep (Saleh and Shapiro, 2008; Shin et al., 2013), decline in student study wellbeing, reduced motivation, and academic achievement (Klusmann et al., 2008; Pakarinen et al., 2010; Oberle and Schonert-Reichl, 2016; Madigan and Kim, 2021).

Teacher burnout is a highly socially embedded syndrome, yet it has typically been explored as an individual experience. This has resulted in a strong body of evidence on individual teacher burnout experience and its determinants (e.g., Brewer and Shapard, 2004; Kokkinos, 2007; van Droogenbroek et al., 2014). Furthermore, previous studies have shown that social interrelations play a crucial role in the development of teacher burnout (Byrne, 1999; Hakanen et al., 2006; Santavirta et al., 2007; Gavish and Friedman, 2010). For example, the previous studies suggest that teacher burnout can spread in schools through social interrelations (Bakker and Schaufeli, 2000; Meredith et al., 2020; Pietarinen et al., 2021), which might further contribute to differences in teacher burnout experiences between schools. However, the school-level differences in teacher burnout and how they change over time have been rarely studied. Therefore, we do not know which burnout symptoms are more likely to be socially induced, which leaves us with insufficient means to prevent teacher burnout at the school community level. In this study, we aim to contribute to

filling the gap in the literature on teacher burnout by exploring the differences in teacher burnout symptoms between schools and how they change over time. In addition, we explored the effect of proactive co-regulation strategies on teacher burnout symptoms in the school community.

Teacher Burnout

It has been suggested that teacher burnout is the result of extensive, prolonged work-related stress (Freudenberger, 1974; Maslach and Jackson, 1981). It consists of three distinct symptoms: emotional exhaustion characterized by chronic fatigue and lack of emotional energy, cynicism referring to mentally distancing oneself from the work and colleagues, and even from students, and professional inadequacy comprising a reduced sense of personal accomplishment, incompetence, and inefficacy as a teacher (Maslach et al., 2001; Hakanen et al., 2006; Maslach, 2015). Previous studies suggest that school comprise multiple social contexts each of which provide distinctive resources and demands for teachers' occupational wellbeing (Dorman, 2003; Grayson and Alvarez, 2008; Pyhältö et al., 2011; Pietarinen et al., 2013a; Richards et al., 2018). Challenges in interaction within the professional community have been shown to raise the risk of experiencing cynicism in terms of alienating from colleagues and being disappointed with the professional community, while professional inadequacy is most typically experienced in interaction with pupils (Pyhältö et al., 2011). To capture the social nature of teaching, we used the socio-contextual measure of teacher burnout, as it includes the primary contexts of cynicism (i.e., interaction within the professional community) and sense of professional inadequacy (i.e., teacher-pupil interaction) (Soini et al., 2010; Pyhältö et al., 2021) in this study.

Since teacher burnout is embedded in social interrelations within a school, the levels of teachers' emotional exhaustion, cynicism, and professional inadequacy can be expected to differ between the schools (Pietarinen et al., 2021). For example, teachers within one school might be more likely to experience higher levels of cynicism about their colleagues, while teachers in another school might be more at risk of experiencing exhaustion or professional inadequacy. Furthermore, several factors affect the quantity and quality of interaction within the schools, and they can further be expected to contribute to the differences in teacher burnout and how it changes over time.

Antecedents of the Development of Teacher Burnout in School

According to Job demands – resources model of employee wellbeing, the factors increasing the risk of burnout are those physical, social, or organizational aspects of job that require constant efforts from the employee (Bakker and Demerouti, 2007). Previous research has identified several individual, inter-individual, and organizational demands and resources contributing to the development of teacher burnout (e.g., Hakanen et al., 2006; Skaalvik and Skaalvik, 2009, 2011; van Droogenbroek et al., 2014; Richards et al., 2018; Saloviita and Pakarinen, 2021), respectively. Individual attributes increasing a

teacher's risk of burnout include some personality traits, such as neuroticism, experienced work overload and time pressure, external locus of control and the use of passive, emotion-focused coping strategies (Byrne, 1999; Dorman, 2003; Montgomery and Rupp, 2005; Hakanen et al., 2006; Kokkinos, 2007; Skaalvik and Skaalvik, 2009, 2017; Swider and Zimmerman, 2010; Parker et al., 2012; Shin et al., 2014). Gender differences in teacher burnout have also been detected, implying that female teachers are more likely to experience exhaustion, while male teachers seem to have higher risk to experience cynicism (Purvanova and Muros, 2010; Innstrand et al., 2011). The inter-individual factors affecting the risk of teacher burnout refer to the impaired social climate of the school (Grayson and Alvarez, 2008). More specifically, friction in professional interactions such as leadership issues, pupil misbehavior, challenging interrelations with pupils' parents, and unsolved problems with colleagues increase the risk of teacher burnout (Dorman, 2003; Hakanen et al., 2006; Skaalvik and Skaalvik, 2009, 2017; Pyhältö et al., 2011; Aloe et al., 2014; Richards et al., 2018). Teacher burnout is also suggested to cross over between teachers *via* professional community interactions (Bakker and Schaufeli, 2000; Kim et al., 2017; Meredith et al., 2020; Pietarinen et al., 2021). Teacher burnout can cross over in professional interactions directly *via* emotional contagion (Buunk and Schaufeli, 1993; Hatfield et al., 1993; Bakker and Schaufeli, 2000; Bakker et al., 2003, 2006) and indirectly, through the negative influence of burned-out teachers on the working conditions of others and the quality of interaction in the school community. For example, co-ruminating about negative work experiences can induce negative emotions about the professional community and pupils among those teachers who have not been involved in original experience (see Boren, 2013; Meredith et al., 2020). It has been shown that teachers' shared perceptions about how burned out their colleagues are can predict the levels of burnout experienced by individual teachers (González-Morales et al., 2012). Accordingly, burnout experienced by one teacher can affect the level of burnout in another person in the same social environment (Westman and Etzion, 1995) that might eventually result in differences in the levels and change in teacher burnout between schools.

Organizational factors can contribute to the risk of teacher burnout by making teaching more stressful and potentially affecting the interaction within the professional community. Such organizational factors include school size, a school's academic level, and the socio-economic status of the school neighborhood. More specifically, teachers working in lower secondary schools have been shown to have higher burnout risk than teachers who teach younger pupils (Pietarinen et al., 2013b; Arvidsson et al., 2016; Skaalvik and Skaalvik, 2017). Teachers working in larger schools are more likely to experience burnout symptoms compared to those who teach in smaller ones (Pietarinen et al., 2013b; Saloviita and Pakarinen, 2021). A reason for this might be that teachers in large schools have been shown to receive less social support than teachers in smaller schools (Skaalvik and Skaalvik, 2009). Moreover, low socio-economic status of the school neighborhood has been shown to be associated with higher levels of teacher burnout (Vercambre et al., 2009; Kim et al., 2017; Pietarinen et al., 2021).

These individual, inter-individual, and organizational level demands and resources are not separate from each other but are mediated by each other. For example, school size can influence the school's social climate and availability of social support within the professional community (e.g., Skaalvik and Skaalvik, 2009). In addition to the resources already available in the work environment, teachers can use strategies to build and use new resources, which can be an asset in preventing teacher burnout at the school community level (Pietarinen et al., 2021).

Proactive Co-regulation Strategies

Proactive co-regulation strategies refer to teachers' efforts to buffer the potential stressors in advance by building and using social resources (Aspinwall and Taylor, 1997; Greenglass et al., 1999; Searle and Lee, 2015; Straud et al., 2015). In other words, when teachers deal with potential stressors proactively, they perceive the potential challenges as opportunities to learn and concentrate on finding a solution instead of seeing the future challenges as obstacles and co-ruminating about them (Greenglass and Fiksenbaum, 2009). By nature, proactive strategies are generic, meaning that they are not directed to a specific stressor but can be used in a range of situations (Straud et al., 2015). Teachers' proactive co-regulation strategies can include asking for and providing social support in the professional community, discussing job demands openly, and considering the potential stressors related to the every-day life of the school as well as school development.

Proactive co-regulation strategies have been shown to be effective in reducing burnout at the individual level (Pietarinen et al., 2013a; Searle and Lee, 2015). Their benefits in preventing teachers' cynicism about the professional community have been highlighted (Pietarinen et al., 2013a). There is also evidence that teachers' skills in using proactive co-regulation strategies can also reduce teacher burnout at the level of the school community (Pietarinen et al., 2021). In other words, teachers' abilities to be proactive in regulating their wellbeing together can be expected to contribute to the differences between schools in the levels of teacher burnout and how they change over time.

Aims of the Study

The aim of this study was to understand the teacher burnout at the school level better by examining the differences between schools in teachers' emotional exhaustion, cynicism, and professional inadequacy and how they change over time. In addition, we aimed to find out whether organizational factors such as the school size, the school's academic level, and the socioeconomic status of the school neighborhood and use of proactive co-regulation strategies can explain differences between schools in the levels and change of teacher burnout. Following hypotheses were tested:

H1: Schools differ from each other in terms of levels of teacher burnout symptoms (i.e., emotional exhaustion, cynicism, and professional inadequacy) and their development over time. As the burnout symptoms are likely to differ in terms of how socially induced they are, the differences in teacher burnout between schools are expected to be more pronounced in emotional exhaustion and cynicism (see Bakker and Schaufeli, 2000; Meredith et al., 2020).

H2: Organizational factors, i.e., the school size, school's academic level, and the socioeconomic status of the school neighborhood are related to the differences between schools in the level and change of teacher burnout. More precisely, the burnout levels are expected to be higher in large schools, in schools in which higher grades are taught (i.e., lower secondary school and combined school), and in schools situated in low socioeconomic neighborhoods (see Vercambre et al., 2009; Pietarinen et al., 2013b, 2021; Arvidsson et al., 2016; Kim et al., 2017; Skaalvik and Skaalvik, 2017; Saloviita and Pakarinen, 2021).

H3: The differences between schools in the levels of teacher burnout and how they change can be explained by the extent to which the teachers within schools use the proactive co-regulation strategies (Pietarinen et al., 2021).

MATERIALS AND METHODS

Research Context

All Finnish comprehensive school teachers must have a master's degree in either educational sciences or another domain, such as mathematics or biology together with compulsory courses (35 credits) in educational sciences. Grades (0)1–6 are typically taught by a primary school teacher holding a master's degree in education, with the main subject being applied educational science or educational psychology. Grades 7–9 are usually taught by subject teachers who hold a master's degree in a certain subject with additional courses in education. Special education teachers teach all grades (0–9), and they have a master's degree in education with the main subject being special education.

Finnish children start school at the age of seven. All the schools are publicly funded and follow the national curriculum. School differences in students' academic achievement are among the lowest in the world (Leino et al., 2019). There is no ability grouping in Finnish comprehensive schools. Accountability systems are flexible and they emphasize trust in and autonomy of teachers and schools (Aho et al., 2006).

Sampling Strategy and the Participants

In Finland, an ethics review is required when research involves intervention in the physical integrity of research participants; deviates from the principle of informed consent; involves participants under the age of 15 being studied without parental consent; exposes participants to exceptionally strong stimuli; risks causing long-term mental harm beyond that encountered in normal life; or signifies a security risk to subjects (Finnish National Board on Research Integrity, 2019, p. 19). None of these conditions were encountered in this study.

To analyze teacher burnout within the professional communities and the school-level differences in teacher burnout trajectories, a longitudinal two-level research design was created. The schools were included in the study in the following phases. First, six school districts around Finland were selected. The purposive selection of the school districts was based all six operating areas within the Regional State Administrative Agency: Southern Finland, Eastern Finland, Northern Finland, Southwestern Finland, Western and Inland Finland, and Lapland. The representativeness of the various

school types was ensured by considering the characteristics of the municipalities in each operating area. Second, based on data from Statistics Finland (2013), we formed an SES index (i.e., socioeconomic status of the living area surrounding the school). The SES index was calculated for each school within the selected districts, and the schools were selected in a way that they represented both high and low SES areas. Due to the sampling strategy, the schools were situated all over the country, varied in location (rural/urban), size, and neighborhood SES (low/high). This resulted in the sample making up 75 comprehensive schools. The first wave of the data collection was conducted during the academic year when the latest curriculum for basic education in Finland was launched (Finnish National Board of Education, 2016). Thus, the follow-up period covers the first three years of the gradual implementation of the reformed curriculum. The data were collected during teacher meetings annually 2016–2018 by a member of the research group. Teachers were informed about the study, and they were given an opportunity to opt out. Teachers gave their informed consent to participate in the study. As identification information, we asked teachers to fill in their names on the survey, but the survey could also be filled anonymously. Only a few teachers (14%, $n = 363$ out of 2619 teachers) did not provide the identification information (i.e., teacher name). The schools were identified for all teachers to allow teachers to be clustered correctly according to their professional communities. Blank survey forms with return envelopes were left for teachers who were absent at the time of the data collection.

A total of 2,619 teachers responded to the survey, of which 1,556 participated at Time 1 (2016), 1,582 at Time 2 (2017), and 1,507 at Time 3 (2018). Responses at all three times were received from 621 teachers (24%), but the whole data set comprising 2619 teachers in 76 schools was used in the analyses. The participants were at various stages of their teaching careers, as their work experience ranged from 0 to 46 years, the average being 15.3–15.6 years at different measurement points. Most of the participants who disclosed their gender, were female ($n = 1683$, 77%) and the minority male ($n = 505$, 23%). The gender distribution of the teachers who responded to the survey corresponded the gender distribution of Finnish teachers: females 77% and males 23% (National Board of Education, 2017).

At Time 1 there were 49 primary, 9 lower secondary, and 16 combined primary and lower secondary schools. The schools were located in neighborhoods with varying socio-economic status, one-half of the lowest SES quartile ($n = 36$), and the other in the highest quartile ($n = 39$). The number of teachers working in the school, i.e., the school size, varied between 3 and 100, the average being 26–28 at T1–T3 (overall average 25). The school-level response rates ranged between 14 and 100% of teachers, being 81, 84 and 83% on average at T1–T3, respectively.

Measures

We used the following scales: (a) Socio-Contextual Burnout Inventory (Pietarinen et al., 2013a,b) and (b) proactive co-regulation strategy scale (4 items) (Pietarinen et al., 2021). Socio-contextual burnout scale draws on seminal work by Maslach and Jackson (1981) and Elo et al.'s (2003) single item

stress scale. It consists of three factors: (1) emotional exhaustion (3 items), and (2) cynicism about the professional community (3 items), and (3) sense of inadequacy in teacher-pupil interaction (3 items). All items were rated on a 7-point Likert scale (1, completely disagree; 7, completely agree) except for the stress item, which was rated on a 10-point scale (1, not at all; 10, very much). The scales are shown in **Supplementary Appendix A**.

To explore the effect of contextual factors on school level differences in teacher burnout we used following school-level variables: The school type indicated the academic level of the school, that is, the grades taught at the school: 1, primary school (grades 0/1–6); 2, lower secondary school (grades 7–9); and 3, combined primary and lower secondary school (0/1–9). The SES indicated the socio-economic status of the neighborhood surrounding each school (1, low; 2, high). School size was measured as the number of teachers in each school, varying between 3 and 100, with the time-invariant average of 25 teachers.

Missing Data Analyses

First, we conducted descriptive and missing data analyses using IBM SPSS software (version 27). The univariate percentages of missing values per scale were small, ranging between 0.3 and 2.5. Little's MCAR test (Little, 1988) showed that the cross-sectional data across individual teachers' burnout and proactive strategy scales were missing completely at random (MCAR) at all three time points (T1: $\chi^2 = 10.46$, $df = 9$, $p = 0.315$; T2: $\chi^2 = 13.08$, $df = 13$, $p = 0.442$; T3: $\chi^2 = 14.01$, $df = 16$, $p = 0.598$). However, across time points, the data on teacher burnout and proactive strategies were not missing completely at random ($\chi^2 = 179.97$, $df = 146$, $p = 0.029$). The main reasons for missing values between time points for individual teachers were leaving or entering the school during the study period or responding anonymously making it impossible to link the responses at separate times. In pairwise comparisons, teachers who responded at two or three time points reported lower levels of burnout symptoms than teachers who participated at one measurement time only.

Missing data were analyzed separately at school level. Out of 75¹ schools at T1, two dropped out of the study after T1 and two more after T2. In addition, a few schools were part of formations of combined comprehensive schools between T1 and T2. These schools remained in the study, resulting in 72 schools at T2 and 70 schools at T3. After dropout and combinations of schools, altogether 76 separate school communities participated in the study over 3 years. According to the Little's MCAR test, the school-level aggregated data were missing completely at random over time ($\chi^2 = 26.68$, $df = 20$, $p = 0.145$).

In conclusion, the data were missing completely at random (MCAR) except for the longitudinal teacher-level data, which could reasonably be assumed to be missing at random (MAR). With MCAR not holding, the complete cases analysis does not produce reliable estimates, and thus, the full-information maximum likelihood estimation with all available data was used (Schafer and Graham, 2002).

¹Due to a human error in data collection, the burnout and proactive strategy scales were not administered in one school at Time 1.

Preliminary Analyses

The subsequent structural equation models (SEM) were estimated in Mplus 8.5 (Muthén and Muthén, 1998–2017) using the full-information maximum likelihood (FIML) estimator with robust standard errors (MLR) to handle missing data and slight skewness in burnout variables. The model fit was evaluated using the following criteria for adequate or good fit: the comparative fit index (CFI) and the Tucker–Lewis index (TLI) above 0.90/0.95, the root mean square error of approximation (RMSEA) below 0.07/0.05 (Hu and Bentler, 1999; Hooper et al., 2008). In addition, the chi square test statistic was used with caution because of its sensitivity to a large sample size.

To examine the effects of the two-level research design and the nested structure of the data, intra-class correlations (ICC) and design effects (deff) were calculated for teachers' emotional exhaustion, cynicism, and sense of inadequacy (see Snijders and Bosker, 1999, p. 16–26). ICC describes the proportion of variance in the socio-contextual burnout and proactive co-regulation strategies between the schools, and design effect approximates the effect of clustered design and between-group variance and is weighted by average cluster size. Median cluster size was used to adjust for unequally sized clusters. Based on ICC and deff, the design-based correction of standard errors in Mplus (i.e., complex analysis; Muthén and Satorra, 1995; Asparouhov, 2005) was used in preliminary analyses to account for the nesting of teachers within schools.

We used confirmatory factor analysis (CFA) to establish adequate measurement models representing the constructs under study and test their measurement invariance across the three waves. Cross-sectional and longitudinal CFA models showed adequate fit with the data (see **Supplementary Appendix Tables B1, B2**). The measurement invariance over time was tested by comparing three models with differing levels of factorial invariance (see e.g., Byrne and Stewart, 2006). The baseline, called the configural model, was the one-factor longitudinal model with adequate model fit. In metric model, the factor loadings were constrained to be equal between time points. Finally, in the scalar model, the intercepts of observed variables were constrained equal in addition to the factor loadings. The scalar invariance over time was established for all constructs based on a negligible decrease in model fit: maximum decrease of 0.01 in CFI and TLI, and maximum increase of 0.015 in RMSEA (Cheung and Rensvold, 2002; Chen et al., 2005; Chen, 2007). Observed mean variables of teacher burnout symptoms and proactive co-regulation strategies were used in further analysis to obtain model identification at the school-level. Finally, single-level latent growth curve models (LGCM) with adjusted standard errors (complex analysis) were estimated to examine the shape of latent growth curve (linear or non-linear) at the teacher level. Linear growth curves with equal or unequal residual variances across time fitted well to model the data (see **Supplementary Appendix Table B3**).

Multilevel Latent Growth Curve Analyses

Multilevel latent growth curve modeling (ML-LGCM) within the SEM framework (Muthén, 1994; Muthén and Asparouhov, 2011)

was used to explore the differences between schools in the initial levels and change in teachers' emotional exhaustion, cynicism, and sense of inadequacy. The analyses were conducted separately for each variable of interest. The observed mean variables were aggregated to the school-level by latent aggregation to examine the random intercepts. The unconditional models including the intercept (i.e., the initial level of variable of interest) and linear slope (i.e., change over time) at both within (teachers) and between (schools) levels were tested first. The ML-LGCM was specified in line with conventional multilevel growth modeling (Muthén and Muthén, 1998–2017). Finally, the conditional models with covariates (i.e., school size, school type and socio-economic status of the school neighborhood, and proactive co-regulation strategies) were tested (see **Figure 1**). For model parsimony, the teachers who changed school between measurement times ($n = 37$, 1.4%), were excluded from the ML-LGCM analysis. Furthermore, the organizational factors and proactive co-regulation strategies were examined as time-invariant covariates. The time-invariant co-regulation variable comprised the mean of available measurements for each teacher. The sample sizes in unconditional ML-LGCM models without covariates were 2609–2619 teachers in 76 schools. After the inclusion of covariates as independent variables, the sample size in conditional ML-LGCM models was 1873 teachers from 68 schools.

RESULTS

Differences Between Schools in Teacher Burnout Symptoms

The intra-class correlations for emotional exhaustion were 0.038 (T1), 0.029 (T2), and 0.033 (T3), for cynicism 0.160 (T1), 0.124 (T2), and 0.115 (T3), and sense of inadequacy in teacher-pupil interaction 0.019 (T1), 0.013 (T2), and 0.039 (T3). The ICCs implied that school-level differences were largest in teachers' cynicism and smallest in teachers' sense of inadequacy (for all descriptive statistics and correlations, see **Table 1**). The unconditional multilevel latent growth curve models (ML-LGCM) of teachers' emotional exhaustion, cynicism, and inadequacy showed good fit with the data (see **Table 2**).

Emotional Exhaustion

The multilevel latent growth curve analysis showed that at the school-level, the average initial level of teachers' emotional exhaustion was moderate (mean intercept 3.74, $p < 0.001$). Teacher exhaustion displayed a slight but significant linear increase from T1 to T3 (mean slope 0.13, $p < 0.001$) at the school level (see **Table 3**). Furthermore, there were significant variabilities around the average initial level at both the individual (intercept variance 2.18, $p < 0.001$) and the school level (0.13, $p = 0.005$). There was also significant variability between the schools (0.03, $p = 0.025$) in the change of teacher exhaustion over time. Accordingly, there were differences in teachers' emotional exhaustion and how it changed over time between the schools. The initial levels of emotional exhaustion also varied between the individual teachers.

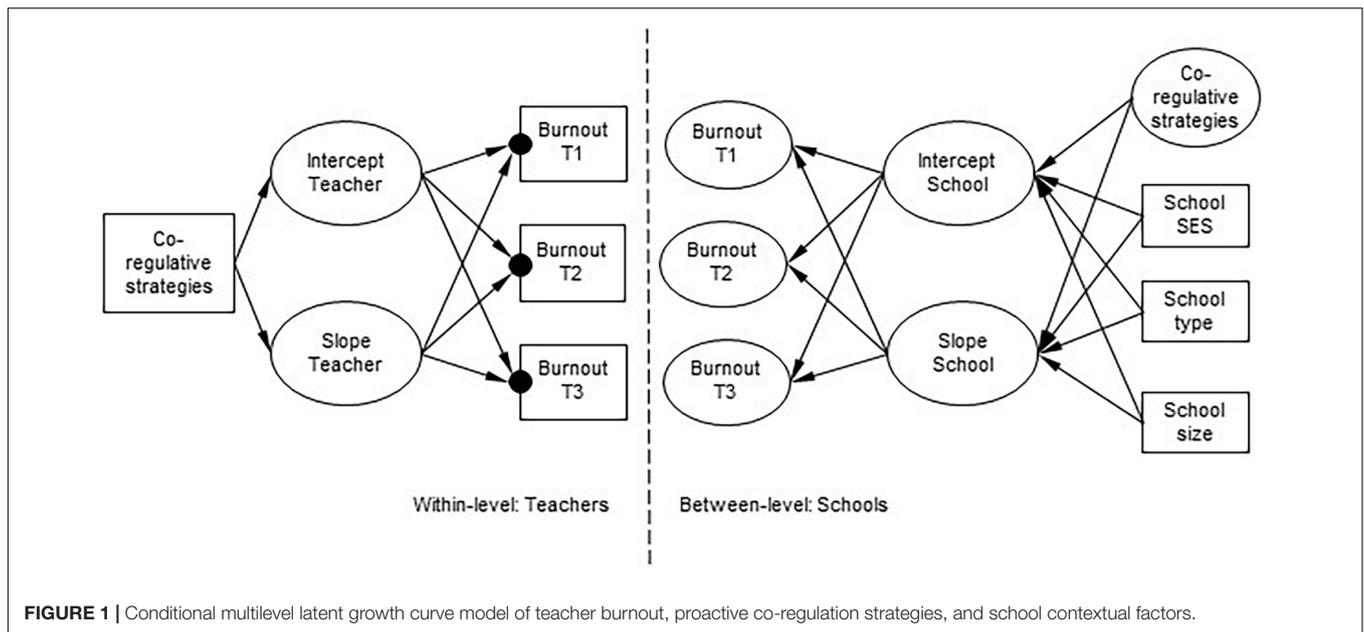


FIGURE 1 | Conditional multilevel latent growth curve model of teacher burnout, proactive co-regulation strategies, and school contextual factors.

TABLE 1 | Descriptive statistics of teacher emotional exhaustion, cynicism, sense of inadequacy and co-regulation strategies, and correlations at within-school and between-school levels.

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Exhaustion T1	1	0.81	0.59	0.33	0.22	0.09	0.71	0.49	0.38	-0.25
2. Exhaustion T2	0.68	1	0.90	0.20	0.26	0.26	0.48	0.64	0.63	-0.25
3. Exhaustion T3	0.65	0.68	1	0.08	0.19	0.33	0.41	0.72	0.81	-0.14
4. Cynicism T1	0.32	0.24	0.23	1	0.87	0.78	0.49	0.24	0.01	-0.72
5. Cynicism T2	0.23	0.34	0.26	0.59	1	0.87	0.48	0.37	0.21	-0.71
6. Cynicism T3	0.20	0.24	0.32	0.51	0.59	1	0.37	0.41	0.36	-0.79
7. Inadequacy T1	0.46	0.36	0.33	0.33	0.21	0.21	1	0.69	0.55	-0.42
8. Inadequacy T2	0.37	0.47	0.35	0.25	0.32	0.24	0.63	1	0.92	-0.23
9. Inadequacy T3	0.37	0.35	0.44	0.26	0.26	0.33	0.60	0.62	1	-0.07
10. Co-regulation strategies T1-T3	-0.33	-0.36	-0.37	-0.48	-0.50	-0.48	-0.17	-0.17	-0.22	1
Mean	3.74	3.90	3.98	2.83	2.88	2.84	2.68	2.72	2.76	4.19
SD	1.82	1.84	1.82	1.18	1.20	1.18	1.72	1.20	1.19	1.21
Range	1-8	1-8	1-8	1-6.7	1-7	1-7	1-7	1-7	1-7	1-7
Alpha	0.83	0.83	0.81	0.71	0.71	0.72	0.71	0.73	0.73	0.90
ICC school	0.038*	0.029*	0.033*	0.160***	0.124***	0.115***	0.019	0.013	0.039*	0.083***
Design effect	1.69	1.52	1.59	3.88	3.22	3.06	1.34	1.24	1.69	2.49

Correlations at the within-level are below diagonal and correlations at the between-level are above diagonal. Statistical significance levels for ICC values: * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$.

Cynicism

At the school level, teachers displayed rather low levels of cynicism about the professional community (mean intercept 2.76, $p < 0.001$). Teachers' cynicism did not show significant change over time (mean slope 0.038, $p = 0.162$) at the school level. However, there was significant variability between the schools (0.028, $p = 0.001$) in the overall change of teacher cynicism over time. Although the schools' average levels of teachers' cynicism did not change, there were schools in which changes occurred. Furthermore, teachers' cynicism did not necessarily change in the same direction in all the schools in which the changes occurred. In addition, there were significant variabilities around

the average initial level at both the individual level (intercept variance 0.732, $p < 0.001$) and at the school level (intercept variance 0.213, $p < 0.001$). The initial level and change of teachers' cynicism were significantly correlated at the school level (covariance -0.040, standardized correlation -0.521, $p < 0.001$), indicating that the higher the initial level of teachers' cynicism, the slower it increased.

Sense of Inadequacy

On average, the initial levels of teachers' sense of inadequacy were relatively low (mean intercept 2.698, $p < 0.001$) at the school level. Teachers' sense of inadequacy showed slight linear increase

TABLE 2 | Model fit indices for unconditional and conditional ML-LGCM models.

Model	N	CFI	TLI	RMSEA	χ^2	df	p
Unconditional models							
Exhaustion	2619	1.00	1.00	0.000	4.19	6	0.650
Cynicism	2609	0.975	0.975	0.029	19.25	6	0.004
Inadequacy	2615	0.999	0.999	0.006	6.48	6	0.370
Conditional models							
Exhaustion	1876	1.00	1.00	0.000	5.77	12	0.930
Cynicism	1873	0.990	0.980	0.024	25.13	12	0.014

N, model sample size; CFI, comparative fit index; TLI, Tucker-Lewis index; RMSEA, root mean square error of approximation. Number of free parameters in unconditional models is 9 and in conditional models 21. Number of clusters, i.e., schools in each model is 76.

from T1 to T3 (mean slope 0.041, $p = 0.042$) at the school level (see **Table 3**). In contrast to emotional exhaustion and cynicism, there was no significant variability around the growth curve components at the school level but only at the individual level: the average initial level varied at the teacher level (intercept variance 0.877, $p < 0.001$).

There were differences in initial levels and change in teachers' emotional exhaustion and cynicism at both the individual and school levels. In teachers' sense of inadequacy, the variation occurred at the individual level only.

Effects of Organizational Factors and Proactive Co-regulation Strategies on Teacher Burnout

The conditional multilevel latent growth curve models with covariates were tested to find out whether organizational factors, i.e., school size, schools' educational level, and SES of the school neighborhood, and proactive co-regulation strategies explained the differences in the initial levels and change in teachers' emotional exhaustion and cynicism at the school level. The conditional ML-LGCM models of teachers' emotional exhaustion, and cynicism with covariates (i.e., school size, schools' academic level, and SES of the school neighborhood, and proactive co-regulation strategies) showed good fit with the data (see **Table 2**). Co-regulation strategies and organizational factors had minor effects on emotional exhaustion and cynicism at the school community level but overall, the variances explained remained low (R^2 for emotional exhaustion intercept 0.24, $p = 0.058$ and slope 0.13, $p = 0.34$; cynicism intercept 0.47, $p < 0.001$ and slope 0.16, $p = 0.15$).

The differences between schools in the initial levels of emotional exhaustion were significantly explained by the academic level of the schools (see **Table 4**). More specifically, the teachers in primary schools and lower secondary schools were more likely to experience higher levels of emotional exhaustion than teachers in combined schools ($\beta = -0.431$, $SE = 0.19$, $p = 0.025$). School size or socio-economic status of the school neighborhood were not related to differences between schools in the levels of teachers' emotional exhaustion. Furthermore, differences between schools in the change of teacher exhaustion were not explained by the organizational factors.

TABLE 3 | Unstandardized parameter estimates of the unconditional multilevel latent growth curve models (ML-LGCM) for teacher exhaustion, cynicism and sense of inadequacy at within-school and between-school levels.

Parameter	Within-level			Between-level		
	Estimate	SE	p	Estimate	SE	p
Exhaustion (N = 2619)						
<i>Means</i>						
Intercept				3.744	0.06	0.000
Slope				0.132	0.03	0.000
<i>Variances and co-variances</i>						
Intercept	2.18	0.11	0.000	0.132	0.05	0.005
Slope	0.04	0.04	0.330	0.033	0.01	0.025
Intercept \times Slope	-0.028	0.05	0.589	-0.037	0.03	0.139
Cynicism (N = 2609)						
<i>Means</i>						
Intercept				2.760	0.06	0.000
Slope				0.038	0.03	0.162
<i>Variances and co-variances</i>						
Intercept	0.732	0.05	0.000	0.213	0.06	0.000
Slope	0.034	0.02	0.135	0.028	0.01	0.001
Intercept \times Slope	-0.024	0.03	0.358	-0.040	0.02	0.007
Inadequacy (N = 2615)						
<i>Means</i>						
Intercept				2.698	0.04	0.000
Slope				0.041	0.02	0.042
<i>Variances and co-variances</i>						
Intercept	0.877	0.07	0.000	0.026	0.02	0.099
Slope	0.017	0.03	0.505	0.007	0.004	0.070
Intercept \times Slope	-0.017	0.04	0.620	-0.001	0.007	0.915

Number of clusters, i.e., schools in each model is 76.

Differences between schools in the change of teacher cynicism were significantly explained by the school size ($\beta = 0.493$, $SE = 0.19$, $p = 0.008$) (see **Table 5**). In large school communities, the teachers' cynicism was more likely to change faster than in small schools. As teachers' cynicism did not necessarily change in the same direction in the schools in which the changes occurred, it might be that in large school communities the cynicism levels were likely to decrease or increase faster than in small school communities. A school's academic level or the socio-economic status of the school neighborhood were not related to differences between schools in the levels of teacher cynicism. The differences between schools in the initial levels of teachers' cynicism were not explained by the organizational factors.

Proactive co-regulation strategies explained differences between schools in the initial levels of teachers' cynicism ($\beta = -0.692$, $SE = 0.13$, $p < 0.001$). In the schools in which teachers reported using strong proactive co-regulation strategies, the cynicism levels were likely to be lower than in schools in which teachers reported weaker co-regulation strategies. In other words, the extent to which the teachers were able to regulate their workload together was related to lower levels of cynicism about the professional community. However, the proactive co-regulation strategies did not explain differences

TABLE 4 | Parameter estimates of the conditional ML-LGCM for exhaustion with contextual and predictor effects at within-school and between-school levels.

Parameter	Within-level			Between-level		
	Estimate	SE	p	Estimate	SE	p
Intercepts						
Intercept				5.504	1.11	0.000
Slope				-0.598	0.64	0.352
Residual variances and co-variances						
Intercept	1.83	0.10	0.000	0.114	0.05	0.024
Slope	0.047	0.04	0.238	0.029	0.01	0.021
Intercept × Slope	-0.048	0.05	0.354	-0.036	0.02	0.124
Covariate effects on intercept						
Co-regulation	-0.442	0.03	0.000	-0.326	0.21	0.123
School SES				-0.314	0.18	0.077
School type-Secondary ^a				-0.123	0.23	0.596
School type-Combined ^b				-0.431	0.19	0.025
School size				0.081	0.26	0.758
Covariate effects on slope						
Co-regulation	-0.019	0.14	0.890	0.247	0.27	0.362
School SES				0.156	0.20	0.426
School type-Secondary				-0.094	0.16	0.562
School type-Combined				0.145	0.23	0.529
School size				0.348	0.29	0.232

Number of teachers was $N = 1873$ and number of schools $k = 68$. Unstandardized conditional estimates for growth curve components and standardized estimates for covariate effects.

^aSchool type: Secondary school vs. other.

^bSchool type: Combined primary and lower secondary school vs. other.

TABLE 5 | Parameter estimates of the conditional ML-LGCM for cynicism with contextual and predictor effects at within-school and between-school levels.

Parameter	Within-level			Between-level		
	Estimate	SE	p	Estimate	SE	p
Intercepts						
Intercept				6.521	0.97	0.000
Slope				-0.460	0.43	0.281
Residual variances and co-variances						
Intercept	0.398	0.05	0.000	0.122	0.03	0.000
Slope	0.020	0.02	0.375	0.023	0.01	0.003
Intercept × Slope	0.002	0.02	0.948	-0.040	0.01	0.002
Covariate effects on intercept						
Co-regulation	-0.659	0.03	0.000	-0.692	0.13	0.000
School SES				-0.006	0.13	0.961
School type-Secondary ^a				0.079	0.08	0.312
School type-Combined ^b				0.185	0.14	0.198
School size				-0.170	0.14	0.220
Covariate effects on slope						
Co-regulation	0.017	0.13	0.894	0.174	0.21	0.395
School SES				0.083	0.19	0.656
School type-Secondary				-0.052	0.15	0.732
School type-Combined				-0.143	0.18	0.436
School size				0.493	0.19	0.008

Number of teachers was $N = 1873$ and number of schools $k = 68$. Unstandardized conditional estimates for growth curve components and standardized estimates for covariate effects.

^aSchool type: Secondary school vs. other.

^bSchool type: Combined primary and lower secondary school vs. other.

between schools in the change of cynicism. Furthermore, using proactive co-regulation strategies was not related to differences between schools in teachers' initial levels or change in teachers' emotional exhaustion.

DISCUSSION

Findings in the Light of Prior Research

The aim of this study was to understand the differences between schools in teacher burnout and how it changes over time. In addition, we explored the effect of organizational factors and proactive co-regulation strategies on teacher burnout symptoms within the school community. By exploring the variation between the schools, the study moves beyond the individual teacher, which has previously been the focus of teacher burnout research. The results showed that differences between schools in teacher burnout were pronounced in teachers' cynicism about the professional community, followed by emotional exhaustion. Organizational factors were not strong predictors of differences in teacher burnout between schools. Proactive co-regulation strategies were related to lower levels of teachers' cynicism about the professional community.

Overall, the results showed that the levels of teachers' emotional exhaustion and sense of inadequacy in teacher-pupil interaction slightly increased during the follow-up period.

There are two potential reasons for this. First, the data were collected right after the implementation of a new national core curriculum. Reforming local curriculum typically results in increased workloads due to teacher engagement in developing local curriculums based on the guidelines of the national core curriculum and implementing it, and uncertainties regarding how the teachers will be able to meet the new demands (e.g., Lasky, 2005; Wilcox and Lawson, 2018). The increased workload might have been reflected in the increased emotional exhaustion and sense of inadequacy among teachers. Second, a reason for the increase in teacher exhaustion and inadequacy in terms of teacher-pupil interaction during the follow-up might be that the proportion of teachers working with teenagers increased. This might have added the challenge of building engaging learning environment for their students. Interestingly, the average levels of teachers' cynicism did not show such an increase. The higher initial levels of teacher cynicism were related to slower increase in cynicism, suggesting that the development of cynicism in school communities is not linear, but rather the progress may be gradual, and differ between the schools.

The results showed that school level differences in teacher burnout were largest in cynicism about the professional community compared to other burnout symptoms. In addition, the levels of teachers' emotional exhaustion varied significantly between schools, although most of the variation in emotional

exhaustion was at the individual level. We did not detect differences between schools in teachers' sense of inadequacy in teacher-pupil interaction. Thus, Hypothesis 1 gained partial support. The results showed that the differences between schools in teachers' emotional exhaustion and how it changed over time were small. A reason for the small differences between schools in teachers' emotional exhaustion might be that teacher exhaustion develops primarily at the individual level, but can become contagious to some extent at the school community level. It has been shown that teachers' emotional exhaustion can cross over in close collegial interactions (Meredith et al., 2020; see also Bakker and Schaufeli, 2000). Therefore, it might be that emotional exhaustion is contagious exclusively in close collegial relationships characterized by high cohesion and frequent interaction (see Westman et al., 2011), but it is not likely to spread to the same extent within the school community. In practice, this may mean that having close relationships is a precondition for frequent co-rumination that provides a route for emotional exhaustion to crossover between the teachers (see also Boren, 2013), which does not typically apply to the whole teaching community. Differences between schools in teachers' sense of inadequacy in teacher-pupil interaction were not detected. Most of the variation in sense of inadequacy seemed to occur at the individual level. Previous studies have suggested that inadequacy is not likely to be contagious in the interpersonal level (Bakker and Schaufeli, 2000; Meredith et al., 2020). Thus, the results indicate that the sense of inadequacy develops individually rather than interpersonally within the professional community. A potential reason for this could be that teachers might be reluctant to discuss their failures in classroom interaction with their colleagues, and hence the sense of inadequacy does not become shared either. On the other hand, discussing the sense of inadequacy with the colleagues does not necessarily provoke such feelings in other teachers. In fact, it may even provoke a reverse experience in colleagues (i.e., downward comparison; see Buunk and Schaufeli, 1993). Moreover, since the object of inadequacy in our study was teacher-pupil interaction, lack of boundary crossing between the classroom practices and practices of the professional community may also be a reason why the sense of inadequacy was not shared within the community.

School-level differences were pronounced in teachers' cynicism, suggesting that teachers' risk of experiencing cynicism toward the professional community is socially induced to a significant extent. This result is in line with previous findings showing that cynicism can become contagious in teachers' close interrelations with their colleagues (Bakker and Schaufeli, 2000; Meredith et al., 2020). In other words, the expression of cynical attitudes of one teacher may provoke such experiences among the others within the school community resulting in differences in teachers' cynicism between schools. Teachers' cynical attitudes can be expected to be particularly detrimental for the professional community and school development since they disengage teachers from joint development efforts and reduce their investment in collaborative problem solving, resulting in reduced professional resources for overcoming challenges

and facing stressors. Our novel results further emphasize the disadvantages of teachers' cynicism by showing that cynicism is shared to a significant extent at the school community level, which indicates that it can cross over between teachers within a school.

School size and the academic level were related to differences in teacher burnout between schools, while socio-economic status of the school neighborhood was not associated with them. Thus, the results partly supported Hypothesis 2. School size explained the differences between schools in the change in teacher cynicism, implying that in large schools, teachers' cynicism was likely to change in faster pace than in small ones. A reason for this could be that in small schools, the teacher's cynical attitudes might be easier to identify and hence to control for. In turn, in large schools, the cynicism can begin to spread unnoticed in small groups, from which it may progress into a school-wide epidemic. However, it might also be that in larger professional communities, the contemporary sub-communities are more easily formed and deconstructed depending on the task at hand. This might result in rapid changes in the intensity of interaction and coherence of the community that increase the risk of experiencing cynicism. In addition, the school's academic level was related to teachers' emotional exhaustion: primary and lower secondary school teachers seemed to be more at risk of experiencing emotional exhaustion than teachers in combined schools (i.e., primary and lower secondary schools). This is contradictory to results from previous studies, as they indicated that a teacher's risk of burnout is lower in primary schools compared to higher school levels (e.g., Skaalvik and Skaalvik, 2017). It might be that as multi-professional communities, the combined schools provide better opportunities and resources to share the workload than primary and lower secondary schools with less versatile professional resources. However, in general the results indicated that the organizational factors were not strong predictors of the differences in teacher burnout between schools.

Proactive co-regulation strategies explained the differences between schools in the levels of teachers' cynicism about the professional community, but not in the levels of teachers' emotional exhaustion or change in cynicism. Hence, Hypothesis 3 gained partial support. A potential reason for the finding is that it takes time for a teaching community to become skillful in intentionally regulating their wellbeing together, and hence, the effect of such strategies in the development of teacher burnout may become apparent in the longer term. Previous studies have shown that teachers' skills in building and utilizing social resources to regulate their wellbeing together are effective in preventing teacher burnout, especially cynicism (Pietarinen et al., 2013a). Our results add to the body of evidence on benefits of such strategies by showing that schools differ in terms of teachers' abilities to support each other and consider their occupational wellbeing in every-day life of school, and such differences further explain the differences in teachers' cynicism between schools. Hence, the use of proactive strategies can prevent teachers' cynicism at the school community level in addition to individual level (e.g., Pietarinen et al., 2013a; Pyhältö et al., 2021).

Practical Implications and Suggestions for Future Research

The results have practical implications for educational policy, school leadership, school development, and teacher education. The results suggested that teachers' burnout symptoms differed in terms of how socially induced they are. Hence, the interventions that aim to prevent and reduce teacher burnout need to be considered from multiple perspectives including individual, inter-individual, and organizational levels (Bakker and Schaufeli, 2000). From the perspective of the JD-R model (Bakker and Demerouti, 2007), the results of the study emphasize the importance of job demands and resources at the individual and school community levels. For example, based on previous findings, to protect teachers from experiencing emotional exhaustion and a sense of inadequacy in teacher-pupil interaction, the interventions aiming to build job resources, such as teacher competence and the learning of proactive self-regulation strategies could be useful (Pietarinen et al., 2013a). Also, measures to reduce job demands such as teachers' work overload, should be considered not only in school leadership, but also in national level educational policy and school development. In turn, to reduce teachers' cynicism about the professional community, the interventions should be targeted primarily at the school community level. For example, it is important that school leaders identify teachers' cynical, distant attitudes in time and take them seriously, as they may harm the whole school community by becoming contagious. The learning of proactive co-regulation strategies should be emphasized in such school-level interventions as well as in pre-service and in-service teacher education because they seemed to provide a significant buffer against teachers' cynicism about the professional community.

Based on the results, several directions for future research can be suggested. In this study, we focused on exploring the school-level trajectories of emotional exhaustion, cynicism, and professional inadequacy separately. In future studies, it will be important to investigate, how the burnout syndrome as a whole develops in the school communities. In addition, as teacher burnout has been shown to have negative consequences for pupils' learning and wellbeing (Madigan and Kim, 2021), in future studies, it is important to investigate if the differences between schools in teacher burnout contribute to differences in pupils' learning and wellbeing. Moreover, the potential means to prevent teacher burnout at the school community level are not limited to proactive co-regulation strategies, which were investigated in this study. As it has been shown that teacher learning and wellbeing are intertwined (Pyhältö et al., 2015), it should be explored, whether teachers' active and skillful learning in the professional community could protect school communities from burnout as well.

Conclusion

The differences between the schools in teacher burnout seemed to be more pronounced in cynicism followed by emotional exhaustion. Organizational factors, i.e., school size, academic

level, and socioeconomic status of the school neighborhood, were not strong predictors of the differences in teacher burnout symptoms between schools. The results imply that cynicism and emotional exhaustion tend to develop at the inter-individual level to a significant extent, while the sense of professional inadequacy in teacher-pupil interaction develops primarily at the individual level. Teachers' abilities in using proactive co-regulation strategies seemed to buffer the risk of experiencing cynicism about the professional community. However, teachers' emotional exhaustion and sense of inadequacy in teacher-pupil interaction cannot be effectively reduced by such strategies. The results indicate that not only individual but also school community level actions are needed to prevent teacher burnout successfully.

Limitations of the Study

In this study, teacher burnout was regarded as a syndrome that is highly embedded in social interaction within the school. Therefore, the social contexts in which the specific symptoms are shown to be typically experienced (Pyhältö et al., 2011; Pietarinen et al., 2013a) were included in the definition of burnout symptoms. More precisely, teacher cynicism was expected to be shown as mentally distancing oneself from the work and colleagues and disappointment toward the professional community, and the sense of professional inadequacy as teachers' feelings of incompetence and inefficacy related to the work with the pupils. In defining emotional exhaustion, the feelings of chronic fatigue were emphasized. This approach provided an opportunity to identify and analyze the significance of varying social contexts to teachers' perceived work-related wellbeing (Pietarinen et al., 2013a). However, as the definition differs from the traditional definition of burnout, the results are not completely comparable with previous studies on teacher burnout.

Teachers' burnout rates and school level differences in teacher burnout are influenced by the features of Finnish educational system. For example, Finnish teachers are highly educated and appreciated in society. They also have pedagogical autonomy to decide on the teaching methods and materials. Accountability structures are flexible, and they emphasize trust in schools (Aho et al., 2006). In addition, the differences between schools in students' academic achievement are generally low (Leino et al., 2019). These features need to be considered when interpreting the results. For example, the results might not be reliably generalized into other contexts. Although the construct validity of the scales has been shown to be acceptable in the Finnish context (Pietarinen et al., 2013a,b; Pyhältö et al., 2021), the scales need to be validated in other school systems especially in identifying the school-level variance.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available due to ethical restrictions. Due to participant's individual consent for using data only for scientific purposes within the research group, the gathered survey data cannot be shared publicly

and supporting data are not available. Requests to access the datasets should be directed to the corresponding author.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the Local Legislation and Institutional Requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

LT had the main role in writing the original draft. KH, KP, JP, and TS contributed to writing the original draft and editing the manuscript. KH had a major role in conducting the analyses.

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SUPPLEMENTARY MATERIAL

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