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Research paper

Teachers’ emotional exhaustion during the COVID-19 pandemic: Levels, changes, and relations to pandemic-specific demands

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In March 2020, the COVID-19 pandemic hit countries worldwide. To reduce the risk of infection, governments in many countries imposed lockdowns, including school closures that forced teachers to change from in-person to digital instruction from one day to the next. In Germany, where the current study was conducted, schools subsequently reopened after two months, pursuing a hybrid strategy. This meant that classes were split into smaller groups that alternately received in-classroom instruction and assignments at home. Consequently, teachers had to manage both groups that alternately received in-classroom instruction and assignments at home. Furthermore, teachers had to manage both modes of instruction simultaneously. After the summer break, schools finally returned to regular in-classroom teaching. However, even then, school life was far from normal. Students and teachers had to wear masks, keep distance from each other, and rigorous hygiene rules determined everyday school life. When infection rates started to increase again in the fall, politicians claimed that keeping schools open was their priority and it was not until Christmas that schools closed again. Initially, the school closure was meant to be a short-term closure but the return to school was not possible before the middle of March 2021. The numerous changes meant a considerable additional organizational effort and a great deal of uncertainty for teachers and principals. In addition, during the time when schools were still open, teachers and principals had to deal with concerns of becoming infected at work.

It is reasonable to assume that the dramatic changes the pandemic imposed on teachers’ and principals’ work impaired their occupational well-being. This is alarming because teachers already perceived their profession as stressful and reported elevated levels of burnout before the pandemic (Herman et al., 2020; Iriarte Redín & Erró-Garcés, 2020). Furthermore, teacher burnout is related to teachers’ health, their retention in the profession, the quality of their instruction, and student outcomes (Arens & Morin, 2016; Klusmann et al., 2016; Klusmann, Aldrup, Roloff, Lüdtke, & Hamre, 2022). However, to date, there is little robust empirical evidence on teachers’ and principals’ levels of and changes in burnout symptoms during the pandemic and on factors that hinder or help them to cope with the dramatic changes.

To address this gap, the present study investigated teachers’ (N = 2157) and principals’ (N = 374) emotional exhaustion, which is the core symptom of burnout (Maslach et al., 2001), during the
pandemic. Moreover, we examined the extent to which teachers and principals reported an increased workload and concerns about students’ and their own health. We also examined whether these job demands were associated with teachers’ and principals’ emotional exhaustion during the pandemic. Furthermore, we aimed to study whether the availability of social support at work served as a resource that can reduce the risk of experiencing emotional exhaustion. The possibility to investigate both teachers and principals is a particular strength of this study. Whereas principals bore special responsibility for initiating a digital transformation at their schools, they had more autonomy and control to shape this process than classroom teachers had. Thus, both groups had specific demands and resources, which may have caused diverging responses to the new challenges.

1. Teachers’ emotional exhaustion: theoretical perspectives

Emotional exhaustion is the core symptom of burnout, reflecting feelings of chronic stress and depletion of one’s emotional and physical resources (Maslach et al., 2001). To understand how the COVID-19 pandemic has affected teachers’ emotional exhaustion, the job demands–resources model (Demerouti et al., 2001), and the transactional model of stress and coping (Lazarus & Folkman, 1984) provide valuable theoretical frameworks. Demerouti et al. (2001) hypothesized that burnout is related to job demands and resources. Job demands refer to aspects of one’s job that are associated with physiological and/or psychological costs because they exact prolonged effort or skill. Job resources are those characteristics of the working environment that support the achievement of work goals and stimulate personal growth, learning, and development. Furthermore, job resources can reduce the adverse effects of job demands. Hence, people can differ in their response to the same demand depending on their available job resources. The transactional model of stress and coping (Lazarus & Folkman, 1984) is in line with these assumptions and suggests that people respond to potential stressors (i.e., demands) in their environment differently depending on their appraisals and available resources. Following Lazarus and Folkman (1984), individuals appraise environmental demands as either irrelevant, positive, or potentially stressful. Depending on individual resources, potentially stressful demands are appraised as a challenge or threat (or harm/loss for stressors in the present or past). If an environmental demand is appraised as threatening and there are no resources available to sufficiently cope with the stressor, a stress response will unfold, potentially causing emotional exhaustion.

2. Teachers’ emotional exhaustion in the COVID-19 pandemic

First empirical evidence indicated an increase in teachers’ burnout symptoms during the COVID-19 pandemic. According to the longitudinal investigation by Pellerone (2021), Italian teachers’ emotional exhaustion and cynicism increased by half a standard deviation compared to pre-pandemic levels. Sokal et al. (2020) reported similar results for Canadian teachers within the time span between April and June 2020. In contrast, Hilger et al. (2021) reported a small but significant decrease in work-related fatigue for German teachers between January and May 2020. Kim et al. (2021) repeatedly investigated the development of 24 teachers’ mental health and well-being in the UK since the onset of the pandemic. Compared to pre-pandemic levels, teachers reported lower well-being during the first lockdown (April 2020). The following teacher reports in July 2020 indicated that their well-being recovered by the end of the school year. However, in November 2020, teachers felt more exhausted again. Moreover, Mari et al. (2021) found that Italian teachers felt more helpless than other professional groups in response to the changes in their daily work.

Therefore, the question arises as to which factors may have been particularly relevant for teachers’ emotional exhaustion during the pandemic, when school closures, distance learning, hygiene rules, and uncertainty regarding the health risk posed by the virus confronted teachers and principals with additional and new job demands. Recent empirical evidence reveals changes in workload and concerns about students and one’s own health as important demands during the pandemic.

First, changes in workload frequently occurred in response to the COVID-19 pandemic and were perceived as stressful by teachers (Kim et al., 2021). For example, about half of the teachers in Germany had not regularly used digital tools as part of their instruction and reported a lack of resources for professional development (Lorenz et al., 2017; OECD, 2020). Furthermore, most teachers did not feel that their teacher education program had prepared them to integrate digital media into their instruction (Drossel et al., 2019). Hence, they had to invest a lot of time to adapt teaching materials and develop their digital competence after the abrupt change from in-person to digital instruction. In addition, about one-third of the students had low computer literacy, less than half of the schools had a digital learning management system, and only 16.5% of the schools had access to internet-based collaborative tools (Eickelmann et al., 2019). These conditions made distance learning highly demanding not only for students but also for their teachers. Communication with students who did not have access to digital devices and the internet required additional effort, and principals, who bore the responsibility for initiating a digital transformation at their schools, needed to invest energy and time to shape this process (Huber et al., 2020; Pollock, 2020). Considering that teachers perceived high levels of workload as stressful even before the pandemic, the additional tasks may have put them at risk of overextending their resources (Hakanen et al., 2006; Kyriacou, 2011; van Droogenbroeck et al., 2014). Female teachers, in particular, may have had less time to perform the extra tasks because they also took over most of the additional care work at home during the pandemic (Power, 2020). However, results regarding gender differences are mixed. On the one hand, studies with relatively young teachers in non-Western cultures did not find any differences between female and male teachers’ occupational well-being in terms of job satisfaction, burnout, or fear of COVID-19 (e.g., Amri et al., 2020; Carreon et al., 2021). On the other hand, findings from studies in Europe with older participants indicate that female teachers experienced more fear and stress in response to COVID-19 (Ozamiz-Etxebarria et al., 2021; Stachteas & Stachteas, 2020).

Second, concerns about students’ and one’s own health seemed to be a prevalent, pandemic-related demand. Teachers and principals observed the pandemic-related consequences for students every day and were confronted with students’ increased mental health issues as well as severe learning losses (Engzell et al., 2021; Marques de Miranda et al., 2020). This resulted in concerns about the health and learning of their students (Kim et al., 2021). Furthermore, when schools reopened again, teachers were exposed to a slightly higher risk of infection (Magnusson et al., 2021). Hence, there was cause for concern not only about their students’ health but also about their own health, especially for teachers at high risk for developing severe symptoms in connection with COVID-19. In line with this, Santamaría et al. (2021) showed that teachers who were chronically ill reported more symptoms of depression, anxiety, and stress during the pandemic than their healthy colleagues.

However, theoretical models also suggest that the availability of resources helps individuals to better cope with demands. Prior research revealed social support as a powerful job resource (Hakanen et al., 2006; Klussmann et al., 2008; van Droogenbroeck et al., 2014). In line with this, initial research in the context of
COVID-19 shows that teachers perceived the possibility to exchange their thoughts and worries with others, for example, colleagues or the principal, as an important resource to cope with the pandemic-related changes (Amri et al., 2020; Kim et al., 2021; Kosić et al., 2020).

Altogether, previous studies support the plausible assumption that pandemic-specific demands impaired teachers' well-being. However, the pandemic presumably had very different impacts on teachers' working lives across countries, so further studies are needed to investigate the determinants of their well-being. Specifically, teachers and principals faced very different demands during the pandemic, but the well-being of these groups of school staff has not yet been examined separately. Finally, it should be noted that only a few studies referred to pandemic-related changes in teachers' well-being.

3. The present study

The aim of the present study was to investigate teachers' and principals' emotional exhaustion during the COVID-19 pandemic. Teachers' emotional exhaustion appears particularly relevant in the current situation because previous research suggested that it is related to students' learning and psychosocial development (Arens & Morin, 2016; Klusmann et al., 2016; Klusmann et al., 2022). In addition, extensive public speculation exists regarding teachers' performance and burnout during the COVID-19 pandemic (Phillips & Cain, 2020; Singer, 2020; Wong, 2020), but reliable empirical evidence about teachers' and principals' experience is limited to date.

Against this background, we first aimed to describe teachers' and principals' emotional exhaustion as the key symptom of burnout during the COVID-19 pandemic. More specifically, we investigated if the level of emotional exhaustion is higher than comparative values for teachers as reported in the Maslach Burnout Inventory (Maslach et al., 2018). In addition, we investigated if teachers and principals differ in their levels of and changes in emotional exhaustion. Second, we included an open response question to assess teachers' and principals' idiosyncratic experience during the COVID-19 pandemic.

In the third step, we investigated whether pandemic-specific demands such as health concerns, concerns about students, extra workload, and risk status, but also social support as a resource, explain teachers' and principals' experiences during the COVID-19 pandemic. Keeping in mind the JD-R (Demerouti et al., 2001) and the transactional model of stress and coping (Lazarus & Folkman, 1984), we assumed that demands but also social support explain individual differences in emotional exhaustion. However, teachers and principals had different responsibilities during the pandemic. While teachers interacted daily with the students (either online or in class), principals had to react to the state department's new laws and communicate these in their schools. Because of these divergent tasks, we differentiate between our teacher and principal sample in analyzing the effects of demands to uncover potential differences in the experience between the two groups.

Our study extends previous work on the well-being of school staff during the COVID-19 pandemic by the following aspects. We drew on a large sample of teachers and principals from different schools in Germany, enabling us to compare the experience of teachers and principals. Moreover, we used an established measure of emotional exhaustion, which allowed us to compare the reported values with previous research. To address the possibility that our established instruments did not capture all relevant aspects of the current experience, we considered an open response question.

4. Method

4.1. Procedure

We contacted 5705 schools in the federal state of North Rhine-Westphalia, Germany. North Rhine-Westphalia is the most populous and urban state, located in the western part of Germany. Schools were contacted via e-mail in October 2020 and we invited principals and teachers to participate in our study (Hansen et al., 2022). The invitation comprised information about the purpose of the study as well as privacy policies and a link to an online questionnaire. Participation was voluntary and anonymous. Participants gave their consent by answering the online questionnaire.

4.2. Sample

The final sample included 2157 teachers and 374 principals from 1581 schools. At the school level, we thus have a response rate at about 27% at the teacher level, it is significantly lower at about 5%.

Sociodemographic characteristics of teachers and principals and school characteristics are presented in Table 1. The size of the schools differed substantially, ranging from small schools with fewer than 20 teachers to very large schools with more than 100 teachers. Both teachers and principals were predominantly female. Most of the teachers were between 31 and 60 and principals between 41 and 60 years old. Teachers and principals were distributed across different school types (i.e., elementary, secondary, and special needs schools).

4.3. Instruments

4.3.1. Emotional exhaustion: level and change

We assessed the level of and change in emotional exhaustion

| Table 1 | Individual and school characteristics for teachers and principals. |
|---------|---------------------------------------------------------------|
|         | Teachers | Principals |
| N       | 2157     | 374        |
| Female %| 79.0     | 69.3       |
| Age %   |          |            |
| 18–30 years | 10.9     | 0.0        |
| 31–40 years | 33.7     | 4.5        |
| 41–50 years | 28.2     | 34.1       |
| 51–60 years | 20.5     | 44.7       |
| >61 years | 6.7      | 16.6       |
| Risk Group% | 17.8   | 26.3       |
| School track% |        |            |
| Elementary schools | 31.6 | 47.1 |
| Secondary schools  | 47.7   | 35.3       |
| Special needs schools | 17.2 | 13.1       |
| Number of teachers per school % |          |            |
| 0–19     | 21.7     | 33.4       |
| 20–50    | 31.0     | 32.1       |
| 51–79    | 17.7     | 19.0       |
| 80–99    | 14.0     | 8.0        |
| >100     | 15.6     | 7.5        |

Note: *Participants reported if they belong to a health risk group with an especially high risk for developing severe symptoms in connection with COVID-19.

1 Reasons for non-participation were twofold. On the one hand, school administrations did not give study information to the teachers which was likely because many principals were reluctant to stress teachers with additional requests during the COVID-19 pandemic. On the other hand, teachers received information and refused to participate. Unfortunately, we cannot differentiate between the different reasons for non-participations complicating the calculation of an exact response rate.
using an established German version of the MBI (Maslach et al., 2018). First, we assessed the level by asking for participants’ current experience of symptoms of emotional exhaustion. Teachers reported the frequency with which they felt emotionally exhausted with nine items on a 7-point scale ranging from 0 = never to 6 = daily (e.g., “I feel burned out from my work”, α = 0.92). Second, we asked for the subjective change caused by the COVID-19 pandemic. Teachers and principals additionally rated all nine items of the MBI again regarding the change caused by the COVID-19 pandemic on a 3-point scale with –1 indicating a decrease, 0 indicating no change, and +1 indicating an increase (α = 0.85).

4.3.2. Pandemic-specific demands and resources

Because of the unique and new circumstances during the pandemic, we had to develop new scales on individual health concerns, concerns about students’ academic and psychosocial development and extra work load. However, we used scales used in previous research as our basis (Alves et al., 2020; Collie, 2021; Stachteas & Stachteas, 2020; Zhao et al., 2020). We measured individuals’ health concerns with three items asking about the fear of being infected with COVID-19 at school and the associated uncertainty (e.g., “I am afraid of contracting the coronavirus from the students.”). Participants answered on a 4-point scale (1 = do not agree to 4 = completely agree; α = 0.89).

Three items measured concerns about students’ academic and psychological development. Again, participants rated each item on a 4-point scale ranging from 1 = do not agree to 4 = completely agree (e.g., “I am concerned about student progress because of the pandemic-specific situation”. α = 0.69).

The extra workload caused by the COVID-19 pandemic was assessed with two single indicators. First, we asked participants the following question: “Since the beginning of the school year: Do you feel that the daily school routine under the COVID-19 pandemic leads to extra work in your job?”. Participants rated the item on a 4-point scale ranging from 1 = not at all to 4 = significantly. Second, participants were asked to indicate how many hours per week they worked more as a result of the pandemic. In the final latent structural equation models (SEMs), we used both items as indicators of the latent variable extra workload.

To assess resources, we used participants’ ratings of their perceived social support from their colleagues during the COVID-19 pandemic with two items, which we adapted from Ramm et al. (2006) to the current situation (e.g., “The school staff coordinates closely on how to proceed in the pandemic-specific situation.”). Participants rated the perceived support on a 4-point scale ranging from 1 = do not agree to 4 = agree (α = 0.69). A detailed overview of the items is given in Appendix A.

4.3.3. Individual and school characteristics

We considered different individual and school characteristics as covariates. We assessed age, gender, and affiliation to a health risk group with an especially high risk for developing severe symptoms in connection with COVID-19. In addition we asked for the size of the school (“Please specify the number of people on your staff”: 0–19, 20–50, 51–79, 80–99, >100) and the school type (elementary, secondary, and special needs school) as school characteristics (see Table 1).

4.3.4. Subjective experience

To get an additional perspective on teachers’ and principals’ subjective experience of their professional lives during the pandemic, we used the following prompt: “In one word: Being a teacher in times of COVID-19 pandemic is...”. Based on the model of Lazarus and Folkman (1984), we organized the words into the following categories: (1) Harm, indicating that the person sees the situation as damaging their well-being and causing losses, (2) Challenge, meaning that the situation calls for the investment of additional resources without threatening the person’s well-being, (3) Irrelevant, implying that the person is not affected by the situation and sees no risk for their well-being, (4) Positive, meaning that the person perceives the situation as beneficial, and (5) Other, if no valence was indicated. Table 2 gives a detailed description of each category, including examples. When coding the teachers’ responses, we coded frequently mentioned words automatically into the overarching categories via syntax. For example, all responses including the term “stressful” were coded as harm. A research assistant checked the results for correctness. Based on a detailed description of the categories and examples, she also coded the responses that we did not categorize via syntax, either because the term was only mentioned a few times or because participants mentioned several words, which was contrary to the instruction. If respondents mentioned multiple terms that fell into different categories, we counted all of them.

4.4. Statistical analyses

In our study, we first described the mean level of and change in teachers’ and principals’ emotional exhaustion as well as the COVID-19 pandemic-specific demands and resources. In this first step, we analyzed the data using the manifest scales. For the comparison of teachers and principals, we calculated analyses of covariance including age and gender as covariates. In the second step, we investigated whether pandemic-specific demands and resources could predict the level of and change in teachers’ and principals’ emotional exhaustion over and above the individual and school characteristics. Because our goal was to investigate whether the predictors were equally relevant in predicting teachers’ and principals’ emotional exhaustion, we used multigroup SEMs. This method allowed us to correct for measurement errors, receive indicators of how well the model fits the data, and compare the regression coefficients one by one between teachers and principals. First, we tested the factorial structure of our central variables using multigroup (teachers vs. principals) confirmatory factor analysis (MCFA). For the emotional exhaustion scale, we calculated parcel scores (i.e., sum scores of subsets of items) to capture the latent constructs. We decided to use parceling because SEMs with parcels rely on fewer parameter estimates, resulting in a better ratio of variables to sample size and more stable parameter estimates (Little, 2013). The use of parcel scores means that the items measuring a specific latent construct are unidimensional (Little et al., 2002), which we took into account by calculating preliminary confirmatory factor analyses, which supported unidimensionality. Thereby, each parcel only loaded on the expected factor (Little, 2013). To evaluate model fit, we drew on Hu and Bentler (1999) and considered the Tucker–Lewis index (TLI) as well as the comparative fit index (CFI) values of ≥ .95, root-mean-square error of approximation (RMSEA) values of ≤ .06, and standardized root-mean-square residual (SRMR) values of ≤ .08 as good model fit. For the level of emotional exhaustion, the results showed that the factor model yielded a good fit (TLI = 0.96, CFI = 0.98, RMSEA = 0.04, and SRMR = 0.03) to the data. Similarly, for the change in emotional exhaustion, the results showed that the factor model yielded a good fit (TLI = 0.97, CFI = 0.98, RMSEA = 0.03, and SRMR = 0.03) to the data (the factor loadings for both models were reported in Appendix B). In the final step, we ran separate multigroup SEMs for level of and change in emotional exhaustion. First, the factor loading of the measurement model was constrained between the two groups, whereas the structural paths were unconstrained. Second, we tested whether the size of the coefficients differed between teachers and principals by
constraining each path separately and comparing the constrained and the unconstrained models using chi-square tests.

All analyses were conducted in Mplus 7 (Muthén & Muthén, 1998-2012) using full information maximum likelihood estimation with robust standard errors to deal with missing data and avoid listwise deletion (Enders, 2010). For the teacher sample, the percentage of missing values was, on average, 12.1% (min = 5.7%, max = 23.3%) and for principals, on average, 10.8% (min = 8.8%, max = 17.1%).

5. Results

5.1. Level of and change in emotional exhaustion

The means and standard deviations of teachers' and principals' pandemic-specific demands and social support are presented in Table 3. On average, teachers reported a mean level of $M_t = 2.29$ ($SD_t = 1.33$) in emotional exhaustion and school principals of $M_p = 2.08$ ($SD_p = 1.27$). Teachers' emotional exhaustion was statistically significantly higher than the emotional exhaustion reported by principals even after controlling for age and gender ($p = .008$). However, the effect size ($\eta^2 = 0.004$) indicated that the difference between both groups was small (Cohen, 1988). The MBI manual also reports norm values for teachers (K-12), which were depicted as sum scores of the nine items (Maslach et al., 2018). Compared to this, 56% of our sample (55.3% teachers, 60.0% principals) can be considered as having rather low levels of emotional exhaustion ($\leq 16$), 23% (23.8% teachers and 25.0% principals) as having medium levels of emotional exhaustion (17–26), and 20.1% (21.0% teachers, 15.0% principals) as having a high level ($\geq 27$) of emotional exhaustion.

Moreover, in both groups, the majority reported that emotional exhaustion increased: 56.4% of the teachers and 60.6% of principals with higher levels of emotional exhaustion were also more likely to experience an increase during the COVID-19 pandemic. The remaining teachers (43.3%) and principals (39.4%) noticed no change in exhaustion. Only 0.2% of the teachers and none of the principals reported that exhaustion decreased.

5.1.1. Pandemic-specific demands and social support

The means and standard deviations of teachers' and principals' pandemic-specific demands and social support are presented in Table 3. Both groups reported equally large concerns about students in terms of learning and psychosocial development ($M_t = 3.08$, $SD_t = 0.59$; $M_p = 3.08$, $SD_p = 0.62$). Health concerns were significantly higher among teachers ($M_t = 2.54$, $SD_t = 0.81$) than among principals ($M_p = 2.10$, $SD_p = 0.77$). Both groups reported high levels of extra workload ($M_t = 3.17$, $SD_t = 0.74$; $M_p = 3.65$, $SD_p = 0.60$) due to the pandemic. In addition, teachers reported working an additional 5 h per week and principals almost 9 h per week. In both indicators, principals reported a significantly higher workload than teachers. Interestingly, there were also high values in the perceived social support from colleagues at work ($M_t = 2.84$, $SD_t = 0.60$; $M_p = 3.22$, $SD_p = 0.49$), with principals perceiving higher levels of social support. In sum, teachers and principals differed in four out of the five pandemic-specific demands and resources surveyed and the majority of effect sizes can be described as medium.

5.1.2. Correlations between emotional exhaustion, pandemic-specific demands, and social support

Table 4 displays the latent correlations between emotional exhaustion, pandemic-specific demands, and social support separately for teachers (below the diagonal) and principals (above the diagonal). The correlation patterns revealed that the level of and change in emotional exhaustion were closely related (teachers: $r_t = 0.46$, principals: $r_p = .53$). This indicates that teachers and principals with higher levels of emotional exhaustion were also more likely to experience an increase during the COVID-19 pandemic.

Table 3

| Category                  | Definition                                                                 | Teachers N = 2157 | Principals N = 374 | ANCOVA |
|---------------------------|-----------------------------------------------------------------------------|------------------|--------------------|--------|
|                           |                                                                             | M    | SD    | M    | SD    | F    | P     | $\eta^2$ P |
| Emotional Exhaustion (0–6)|                                                                             | 2.29  | 1.33  | 2.08  | 1.27  | 7.14 | .008  | .004      |
| Change in Emotional (−1 to 1)|                                                                                   | 0.56  | 0.50  | 0.61  | 0.46  | 2.19 | .896  | .000      |
| Health Concerns (1–4)     |                                                                             | 2.54  | 0.81  | 2.10  | 0.77  | 105.46 | .000  | .048      |
| Concerns about Students (1–4) |                                                                                   | 3.08  | 0.59  | 3.08  | 0.62  | 1.53 | .271  | .001      |
| Subjective Workload (1–4) |                                                                             | 3.17  | 0.74  | 3.65  | 0.60  | 94.25 | <.001 | .046      |
| Extra Work (in Hours/Week)|                                                                             | 5.15  | 5.04  | 8.64  | 6.24  | 89.87 | <.001 | .046      |
| Social Support (1–4)      |                                                                             | 2.84  | 0.60  | 3.22  | 0.49  | 110.40 | <.001 | .056      |

Note: Displayed means are unadjusted for the control variables age and gender that were included as covariates in the ANCOVA; statistically significant coefficients at $p < .05$ are in bold; change in emotional exhaustion: $−1 = \text{less}$, $0 = \text{equal}$, $1 = \text{more}$ as compared to before the pandemic.
For both teachers and principals, we found significant correlations between the level of emotional exhaustion and health concerns \((r_t = 0.31, r_p = 0.34)\), concerns about students \((r_t = 0.09, r_p = 0.17)\), and workload \((r_t = 0.28, r_p = 0.34)\). Similarly, we found significant correlations between change in emotional exhaustion and health concerns \((r_t = 0.37, r_p = 0.35)\), concerns about students \((r_t = 0.28, r_p = 0.29)\), and workload \((r_t = 0.53, r_p = 0.62)\). Social support was associated with lower levels of emotional exhaustion for teachers and principals \((r_t = -0.21; r_p = -0.13)\) and less increase in exhaustion \((r_t = -0.13; r_p = -0.12)\), which was, however, statistically significant only for teachers.

### 5.1.3. Subjective appraisal of the COVID-19 pandemic: coding of the open answers

Participants were asked what being a teacher was like during the pandemic; 2025 responded \((N = 1725\) teachers, \(N = 300\) principals). Because 42 participants mentioned multiple words, the total number of responses that we categorized was 2067. As summarized in Table 2, the majority perceived the situation as harmful \((52\%\) of all responses), as indicated by words such as being stressed, exhausted, frustrated or feeling endangered. A substantial number of teachers felt at least challenged \((35\%\) of all responses), noting that the situation involved several additional and new tasks and required high flexibility. However, there were also a few teachers and principals \((10\%)\) who perceived positive aspects, such as the high relevance of their work for students and the variation that the new situation brought with it. Finally, 3\% of the responses indicated that the pandemic was perceived as irrelevant for teachers’ well-being because they felt the situation was not different than usual or was manageable, or because they focused on the aspect of financial security in their profession.

In the next step, we computed chi-square tests to analyze whether teachers and principals differed in their subjective perception of the situation, which was the case \((\chi^2[4, N = 2067] = 31.59, p < .001)\). Principals perceived the pandemic as a threat less frequently than teachers did \((39\%\) vs. \(54\%\) of all responses) and rather saw it as a challenge \((41\%\) vs. \(34\%\)) or even as positive \((16\%\) vs. \(9\%\)).

### 5.2. Predicting teachers’ emotional exhaustion

First, we calculated latent multigroup SEMs to answer the question of whether pandemic-specific demands, social support, and school and individual characteristics predicted the level of and change in emotional exhaustion. For both models, we found a good fit to the data \((Level: CFI = 0.97, TLI = 0.96, RMSEA = 0.04, SRMR = 0.03, \chi^2[222] = 588.10; Change: CFI = 0.97, TLI = 0.96, RMSEA = 0.04, SRMR = 0.03, \chi^2[222] = 542.34)\). The results of the latent multigroup SEMs are displayed in Table 5 and in Fig. 1.

We found that health concerns and workload predicted individual differences in the level of emotional exhaustion. The more teachers \((b_t = 0.24)\) and principals \((b_p = 0.35)\) reported being afraid of getting a COVID-19 infection in school, the more often they experienced symptoms of emotional exhaustion. In addition, the higher extra workload caused by the COVID-19 pandemic was significantly associated with higher exhaustion. Interestingly, the association between workload and exhaustion was significantly higher among principals \((b_p = 0.47)\) than among teachers \((b_t = 0.22)\). As expected, perceived social support by colleagues was related to lower levels of emotional exhaustion. This association was similar in size among teachers \((b_t = -0.22)\) and principals \((b_p = -0.22)\). Regarding the covariates, school size was negatively related to emotional exhaustion and this association was more pronounced in the group of principals \((b_t = -0.10; b_p = -0.26)\).

Second, we aimed to explain individual differences in the change in emotional exhaustion that were caused by the COVID-19 pandemic. Again, teachers and principals experiencing more health concerns \((b_t = 0.24; b_p = 0.31)\) and an extra workload \((b_t = 0.45; b_p = 0.75)\) were more likely to report an increase in emotional exhaustion. The effect of workload was larger among principals than among teachers. In addition, teachers who had greater concern about students’ learning and psychosocial development were more likely to experience an increase in emotional exhaustion \((b_p = 0.15)\). Again, teachers and principals who perceived more social support \((b_t = -0.14; b_p = -0.25)\) were less likely to show an increase in exhaustion. In terms of the covariates, teachers and principals at high risk for developing severe symptoms in connection with COVID-19 were less likely to experience an increase in emotional exhaustion \((b_t = -0.06; b_p = 0.28)\). Moreover, female teachers reported an increase in emotional exhaustion more frequently than male teachers did \((b_t = 0.08)\).

### 6. Discussion

The present study aimed to investigate the level of and change in teachers’ and principals’ emotional exhaustion as the core symptom of burnout during the COVID-19 pandemic. Moreover, we were interested whether pandemic-specific demands and social support had predictive validity for the level of and change in emotional exhaustion.

#### 6.1. Emotional exhaustion of teachers and principals during the COVID-19 pandemic

In general, we found an average degree of emotional exhaustion with a slightly higher level for teachers compared to principals. However, more than one in seven principals and even one in five teachers reported a high degree of emotional exhaustion according to the norm values for K-12 teachers \((Maslach et al., 2018)\). These proportions of the highest category concerning emotional exhaustion exceed those reported in previous work on teachers \((Klusmann et al., 2016)\). Furthermore, our findings show that more than half of our sample reported an increase in emotional exhaustion during the pandemic. Accordingly, the idiographic part of our study reveals, that the great majority appraised the situation as potentially stressful with more than half of the sample describing the situation as harmful, using adjectives such as “exhausting” or “frustrating” and only a smaller part as challenging. According to the transactional model of stress and coping \((Lazarus & Folkman, 1984)\), these results indicate that the majority of teachers and principals lack necessary resources, which makes individuals in stress-relevant situations particularly vulnerable. Consequently, the pandemic can be considered a critical phase for many teachers and principals which triggered a negative development in their experience of stress. Importantly, the subjective
An increase in emotional exhaustion was greater than in other critical phases of teachers’ professional lives, such as their first years of teaching, which are often associated with a reality shock (Dicke et al., 2015; Voss & Kunter, 2020). Dicke et al. (2015) reported an increase in emotional exhaustion during the entry into the profession for only 23% of their teacher sample, whereas three out of four teachers reported no significant change. Beyond subjective appraisals and a lack of resources, the results of the current study might also be explained by characteristics of the pandemic situation itself. Different than the transition into working life, the COVID-19 pandemic has several characteristics making it potentially more stressful because it was an unexpected event, which is additionally quite unpredictable in terms of duration and development, and further it is relatively uncontrollable by individuals (Schwarzer & Knoll, 2003).

6.2. Pandemic-specific demands and social support: differences between teachers and principals and relations to emotional exhaustion

Regarding pandemic-specific demands, we found that both teachers and principals rated concerns about students and subjective workload, in particular, as high. This finding is not surprising. First, caring for students is the core of the profession and many teachers form close relationships with their students (Butler, 2012; Hargreaves, 2000; O’Connor, 2008). Hence, noticing the severe emotional, social, and academic consequences of the pandemic for students (e.g., Engzell et al., 2021; Marques de Miranda et al., 2020) inevitably induces worries. Second, both teachers and principals adopted new tasks, which likely induced the feeling of an increased workload. For example, teachers had to organize distance learning.

![Diagram](image)

**Table 5** Predicting level of and change in emotional exhaustion with individual and school characteristics: Results from latent multigroup SEM.

| Level of Emotional Exhaustion | Change in Emotional Exhaustion |
|------------------------------|--------------------------------|
|                              | Teachers | Principals | 4Δ² | Teachers | Principals | 4Δ² |
|                              | b       | SE     | p    | b       | SE     | p    | b       | SE     | p    | b       | SE     | p    |
| Health concerns              | 0.24    | 0.03   | .000 | 0.35    | 0.07   | .000 | 0.37    | 0.03   | .000 | 0.31    | 0.08   | .000 | .183 |
| Concerns about Students      | 0.02    | 0.03   | .607 | 0.07    | 0.11   | .858 | 0.73    | 0.03   | .000 | 0.17    | 0.09   | .000 | .211 |
| Extra Workload               | 0.22    | 0.03   | .000 | 0.47    | 0.15   | .002 | 0.028   | 0.45   | 0.03 | 0.000   | .09   | .000 | .099 |
| Social Support               | -0.22   | 0.03   | .000 | -0.22   | 0.07   | .002 | .825    | -0.14  | 0.03 | 0.000   | -0.25  | 0.09 | .003 |
| Covariates                   |         |        |     |         |        |     |         |        |     |         |        |     |
| Age                          | -0.02   | 0.03   | .533 | 0.07    | 0.07   | .351 | .272    | 0.01   | 0.02 | .626    | 0.05   | 0.08 | .655 |
| Gender (0 = m., 1 = f.)      | 0.00    | 0.02   | .997 | -0.04   | 0.07   | .519 | .541    | 0.08   | 0.02 | .001    | 0.09   | .452 | .053 |
| Risk Group (0 no, 1 = yes)   | -0.03   | 0.03   | .171 | -0.15   | 0.11   | .047 | .108    | -0.06  | 0.02 | .021    | -0.07  | 0.09 | .452 |
| School Size                  | -0.10   | 0.03   | .007 | -0.26   | 0.08   | .003 | .051    | -0.07  | 0.03 | .048    | -0.16  | 0.11 | .135 |
| Elementary                   | 0.03    | 0.04   | .352 | 0.00    | 0.22   | .976 | .712    | 0.04   | 0.04 | .224    | 0.19   | 0.10 | .061 |
| Special Needs                | -0.04   | 0.03   | .122 | 0.07    | 0.13   | .396 | .166    | -0.03  | 0.03 | .263    | 0.12   | 0.10 | .212 |
| R²                            | .19     | .35    |     | .40     | .70    |     |

**Note.** Among school types, secondary school served as the reference group.

In addition to the displayed relations, all endogenous variables were also controlled for age, gender, belonging to a health-related risk group, school size and school type; significant coefficients at p < .05 are in bold.

![Diagram](image)

**Fig. 1.** Results from Multigroup-SEMs for Level of and Change in Emotional Exhaustion: Standardized Path Coefficients for Teachers (Before Slash) and Principals (After Slash).
which presented a particular challenge in Germany because many teachers felt unprepared to use digital media (Drossel et al., 2019). Moreover, when teaching in schools was possible again, teachers had to deal with numerous and partly time-consuming hygiene rules, such as test obligations or additional working time due to the separation of cohorts. Principals were dealing with the same issues but from a different perspective; while teachers implemented the digital lessons, it was the responsibility of the principals to ensure that the technical requirements were fulfilled (Huber et al., 2020; Pollock, 2020). Similarly, while teachers had to adhere to hygiene plans, it was the task of the principals to develop them in the first place, based on the constantly changing requirements of the federal and state governments. As the comparison of teachers’ and principals’ additional tasks illustrates, principals had to provide many impulses and had a great deal of additional organizational work to do. This may have caused principals to report an even heavier subjective workload than teachers did.

Moreover, we found differences between teachers and principals regarding the number of health concerns and the amount of social support. Teachers more often reported health concerns. This is conceivable because teachers had closer and more frequent contact with students than principals when classroom teaching was possible again. Surprisingly, Nabe-Nielsen et al., 2021 found that nearly 40% of Danish teachers were afraid of getting an infection while teaching at school. In terms of social support, differences in favor of principals occurred. They reported being in close contact with colleagues and participating in coordinated action. It is reasonable to assume that principals had, indeed, most contact with colleagues because of their role as a coordinator. However, their role as a coordinator may have caused positively biased responses because of an (unconscious) desire to present oneself as a principal who successfully keeps the team together.

Concerning the predictive validity of pandemic-specific demands and social support for teachers’ and principals’ emotional exhaustion, we found that the additional workload and pandemic-specific health concerns positively predicted the level of and change in emotional exhaustion for both teachers and principals and that the reverse pattern emerged for social support. These findings were in line with our expectations and theoretical assumptions such as those of the JD-R model (Demerouti et al., 2001) and the transactional model of stress and coping (Lazarus & Folkman, 1984).

In terms of workload, our results coincide with previous research that showed a positive relationship between workload and teachers’ emotional exhaustion (Baeriswyl et al., 2021). Interestingly, the predictive validity of the additional workload was higher for principals than for teachers, which is especially worrying against the background that the principals reported very high levels of subjective workload and additional working hours. The principals’ extreme work gain (on average 8.64 h per week) may become harmful more rapidly because time for recovery is lacking (Sonntag, 2003).

Our finding that principals and teachers who reported more health concerns also had higher emotional exhaustion indicated that individuals’ health is a central life domain and one of the most important resources (Maybery et al., 2007). Previous research also showed that daily worries about individuals’ health and/or symptoms of health impairment were significantly related to increased emotional exhaustion (Klusmann, Aldrup, Schmidt, & Lüdtke, 2021; Mathier et al., 2014). Since the time of data collection for the present study, hygiene measures and vaccinations have reduced the risk of infection. Thus, it would be interesting to know whether health concerns still play a decisive role in teachers’ and principals’ well-being.

In line with our expectations, we found lower levels of and a smaller increase in emotional exhaustion among teachers and principals who reported more social support. This is in accordance with prior research showing that social support is one of the key resources for teachers and principals (De Heus & Diekstra, 1999; Greenglass et al., 1997). However, in the current study, teachers and principals reported, on average, relatively high levels of social support and, at the same time, more than half of our sample reported an increase in emotional exhaustion; this finding might indicate that social support alone is not enough to compensate for the increasing demands caused by the pandemic. Especially those whose level of emotional exhaustion is approaching a clinical level are likely to need additional support as provided through stress management (e.g., Ebert et al., 2014) or mindfulness programs (e.g., Harris et al., 2016; Roesser et al., 2013).

Whereas the results for workload, health concerns, and social support were comparable across models, teachers’ concerns about students negatively predicted change but did not predict the level of emotional exhaustion for teachers; this was not the case for principals. This difference might be due to teachers having a more intensive exchange with students through daily lessons, compared to principals. Students, due to teachers’ close relationship with them, largely shape teachers’ emotional experiences (Frenzel et al., 2009; Hargreaves, 2000). The frequency and intensity of interactions with students might make teachers even more vulnerable to experiencing negative emotions when confronted with students’ struggles because it increases their affective empathy (Preston & de Waal, 2002).

Finally, we would like to discuss the results for health-related risk type and gender. First, our study shows that belonging to a group at especially high risk for developing severe symptoms in connection with COVID-19 was not associated with an increase in teachers’ and principals’ emotional exhaustion. This is surprising as one could assume that people belonging to this risk group are especially prone to experience stress when having various contacts with students and colleagues in school and that they could thus feel exhausted. One reason that might have caused this finding is that school staff belonging to a risk group was partly exempted from teaching. Thus, these teachers neither were exposed to health risks in school nor did they have an additional workload. Second, like in previous studies (e.g., Amri et al., 2020; Ozamiz-Etxebarria et al., 2021), our results regarding gender differences are mixed. While we found a significantly higher increase in emotional exhaustion among women, there were no significant differences in the level of emotional exhaustion between men and women. However, since we did not statistically test the differences between level and change of emotional exhaustion, one should handle this result with caution. From this, we can only conclude that the gender differences in emotional exhaustion were small, with women reporting a slightly higher increase in emotional exhaustion during the COVID-19 pandemic.

6.3. Limitations and future research

Despite the strengths of this study, limitations also need to be mentioned. First, cross-sectional data are the basis of the current study. We used a retrospective self-assessment of the change in emotional exhaustion instead of longitudinal data with an initial assessment of emotional exhaustion prior to the pandemic. Therefore, it is not certain that the level of and reported changes in emotional exhaustion are actually attributable to the pandemic. In addition, the cross-sectional nature of our data does not allow us to draw causal conclusions. While theoretical models highlight that demands and resources influence the experience of emotional exhaustion (Demerouti et al., 2001; Lazarus & Folkman, 1984), it is
also conceivable that teachers and principals who already feel exhausted experience demands as more threatening.

Second, although we have a relatively large sample of teachers and principals from one federal state in Germany, one clear limitation is that only a small fraction of the teacher population participated. In addition, we cannot report the actual response rate because we do not know how many teachers received the invitation to participate in our study since it was sent to the official mail of the schools on the internet with the request to forward it. Therefore, we cannot exclude that our sample is biased regarding exhaustion, demands, and resources compared to the whole group of teachers in the federal state. However, previously, Simonetti et al. (2020) have investigated the effects of non-responder bias on the mean values of burnout symptoms in a large-scale sample of health care workers. They concluded that correcting for response bias leads to a 3–4% increase in exhaustion, which they estimate to be relatively small. Furthermore, whereas non-response bias could affect the mean values, it is less likely to have impacted the correlational findings.

Third, we assessed only a limited number of individual and environmental resources and demands. Other influencing factors may include, for example, the presence and extent of pandemic-related care work at home (e.g., due to school closures affecting teachers’ or principals’ own children), the lack of a suitable workplace at home, the lack of digital skills or characteristics of the school environment (e.g., Dreer & Kracke, 2021). Furthermore, overly compassionate teachers might be at higher risk of experiencing exhaustion because they are likely most concerned about their students (c.f., Adams et al., 2006). Considering a broader set of demands and resources and their unique contributions would be helpful to determine the most relevant aspects. Furthermore, we did not use established scales to assess demands and resources; thus, their validity is uncertain. However, similar scales have been used in previous research to assess these constructs (Alves et al., 2020; Collie, 2021; Stachteas & Stachteas, 2020; Zhao et al., 2020).

Fourth, we focused only on emotional exhaustion as the core symptom of burnout (Maslach et al., 2001). Nonetheless, it would be interesting to see if corresponding changes, such as those we found in emotional exhaustion, would be found for the other burnout symptoms as well. Reduced personal accomplishment, in

Table A1

| Scale | Items |
|-------|-------|
| Health Concerns | Due to the COVID-19 pandemic, I am afraid of going to school |
| | I am afraid of contracting the coronavirus from the students |
| | I worry more about my health since the beginning of the COVID-19 pandemic |
| Concerns about Students | The COVID-19 pandemic is a great strain for the students |
| | I am concerned about the psychological development of the students because of the pandemic-specific situation |
| | I am concerned about student progress because of the pandemic-specific situation |
| Subjective Workload | Since the beginning of the school year: Do you feel that the daily school routine under the COVID-19 pandemic leads to extra work in your job? |
| Extra Work | Due to the demands of the COVID-19 pandemic, I work ... hours of weekly overtime on average |
| Social Support | The school staff coordinates closely on how to proceed in the pandemic-specific situation |
| | Even during school closures, the teaching staff was in close contact |

Note. For licensing reasons, the items for Emotional Exhaustion are not printed (Maslach et al., 2018).

Table B1

| Items/Parcels | Health Concerns | Concerns About Students | Workload | Social Support |
|---------------|-----------------|-------------------------|----------|---------------|
| Teachers' Exhaustion | | | | |
| Model 1: Level | | | | |
| Teachers | .79 | .86 | .76 | .65 | .76 |
| 2 | .94 | .91 | .74 | .72 | .65 |
| 3 | .88 | .79 | .47 | | |
| Principals | .75 | .85 | .77 | .39 | .81 |
| 2 | .94 | .91 | .82 | .61 | .73 |
| 3 | .85 | .72 | .52 | | |
| Model: 2 Change | | | | |
| Teachers | .67 | .86 | .76 | .61 | .76 |
| 2 | .84 | .91 | .74 | .79 | .65 |
| 3 | .83 | .79 | .47 | | |
| Principals | .69 | .85 | .76 | .35 | .81 |
| 2 | .83 | .91 | .82 | .64 | .73 |
| 3 | .82 | .72 | .52 | | |
particular, might have changed significantly for those teachers insecure about using digital media. Moreover, negative experiences, such as burnout, and positive qualities, such as work engagement, are separate phenomena (Demerouti et al., 2001; Watson et al., 1988). Thus, despite the increases in exhaustion, teachers and principals may still invest effort and be satisfied with their jobs (Schult et al., 2014), so future research should also include the positive dimension of well-being.

7. Conclusion and Implications

The present study contributes to more knowledge about the extent of teachers’ and principals’ emotional exhaustion during the COVID-19 pandemic. Although the average level of emotional exhaustion was medium-sized, it is noteworthy that over 20% of the teachers and 15% of the principals reported a high degree of emotional exhaustion. Moreover, the majority of teachers and principals reported increases in emotional exhaustion and experienced the pandemic as harmful. This is especially alarming considering the association of teachers’ burnout with health, retention in the profession, the quality of their instruction, and student outcomes (Arens & Morin, 2016; Klusmann et al., 2016; Klusmann et al., 2022).

Thus, it seems particularly relevant that highly exhausted teachers and principals can recover. Previous research suggested that critical life events can have a lasting impact on individuals and that it may take many years for adaptation to occur and sometimes adaptation is not complete (Luhmann et al., 2012). To avoid emotional exhaustion becoming chronic, further long-term negative consequences for teachers’ and principals’ health, as well as for students’ academic and psychosocial development, targeted interventions seem highly important (Iancu et al., 2018). The present results suggest addressing teachers and principals of any age and school type and additionally supporting them in schools with presumably ongoing demands such as dealing with students’ learnings gaps and/or mental health problems. For example, this support could entail consulting school psychologists to address students’ mental health and thus overcome teachers’ worries about students (Beltman et al., 2016). In addition to interventions, longitudinal studies are also needed to investigate the further development of teachers’ and principals’ emotional exhaustion in post-pandemic times.

Author note

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Data availability

The authors do not have permission to share data.

Appendix A

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