

COVID-19 Risk Management and Emotional Reactions to COVID-19 Among School Teachers in Denmark

Results From the CLASS Study

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Objectives: We explored teachers' emotional reactions to the COVID-19 pandemic, and the association between COVID-19 risk management and these emotional reactions. **Methods:** We used cross-sectional data from 2665 teachers working at public schools. Participants responded to a questionnaire in May 2020. The analyses were adjusted for sex, age, cohabitation, and region. **Results:** Knowledge about adequate test behavior and feeling secure regarding colleagues' actions to hinder spread of virus were associated with less frequent emotional reactions. Lack of access to personal protective equipment and exposure to infected pupils, parents or colleagues were associated with more frequent emotional reactions. **Conclusion:** Similar to other groups of frontline employees, teachers experience negative emotional reactions to the COVID-19 pandemic. Gaining knowledge about teachers' worries and fears during pandemics is an important first step enabling leaders and occupational health professionals to address these.

Keywords: COVID-19, cross-sectional, mental health, occupational health, school teacher

BACKGROUND

The COVID-19 pandemic has profound implications for frontline employees.^{1,2} Yet, previous research has primarily focused on healthcare professionals. Nevertheless, also other occupational groups play an important societal role in controlling a virus outbreak,³ while they perform their core tasks. For example, teachers at public schools have to manage their teaching responsibilities, while also adhering to guidelines regarding the hindrance of spread of infection.

Thus, in a context where social contacts should generally be avoided in order to reduce transmission of infection, teachers are still expected to turn up at their workplace apart from during

temporary school closures.³ Similar to other groups of frontline employees, teachers have multiple social contacts as part of their work, which is likely also to involve physical proximity to the pupils. Yet, teachers may be less accustomed to using personal protective equipment (PPE) and hindering spread of infection as part of their everyday practices.⁴ Furthermore, despite that even younger children can be taught basic rules of hygiene,⁵ establishing new routines and ensuring that the pupils adhere to these are likely to require a considerable amount of time and energy from teachers.

Apart from such practical obstacles, the public discourse about COVID-19, for example, at social media,⁶ and the massive media coverage with daily updates about number of newly infected and fatal cases, is likely to yield a sense of danger. Despite that recent data suggest that children appear to play a negligible role in transmission of SARS-CoV-2,⁵ this information was not available in the beginning of the COVID-19 pandemic. Furthermore, the consequences of an infection can have detrimental and long-term consequences in specific, particularly vulnerable groups, for example, employees with chronic disorders.⁷ Therefore, fear of infection and fear of transmitting infection from work to one's home may be substantial. In addition to coping with their own emotional reactions to the pandemic, teachers also have to handle parents' and pupils' reactions to the pandemic.

Thus, in spite of teachers' important and potentially challenging societal role during virus outbreaks no previous study has addressed pandemic-related working conditions among teachers during the current or earlier pandemics. Against this background, we initiated a study on teachers' working environment during COVID-19. The survey was conducted in May 2020 during the partial re-opening of public schools in Denmark. The aim of the present paper was to explore teachers' emotional reactions to the COVID-19 pandemic, and the association between COVID-19 risk management and these emotional reactions.

METHODS

Data Collection

Data for the present study constituted the baseline survey of CLASS. CLASS is a research project on the effects of COVID-19 on teachers' working environment, sense of community and perceived risk of infection. Data were collected via an online questionnaire between the 6th and 17th of May 2020. The questionnaire was sent out by email including one reminder by the 11th of May. The data collection was managed by the Danish Union of Teachers (DLF), which organizes teachers employed in public schools in Denmark. DLF organizes approx. 50,000 teachers. The study was designed in collaboration between the authors of the present study.

Context

In Denmark, the first confirmed case of COVID-19 was identified the 26th of February 2020, and the 11th of March a total lock-down of all public workplaces apart from critical functions was announced. During the lock-down, public teachers implemented remote emergency teaching. By the 17th of April (after the Easter

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The collaboration between the University of Copenhagen and Danish Union of Teachers was initiated by KN-N. The aim of this study was proposed by KN-N and CJN, and it was discussed and agreed on among all authors. KN-N, NVF, IL, and CJN contributed to the development of the questionnaire, and NVF administered the data collection. KN-N drafted the manuscript. CJN critically revised the first version of the manuscript. KN-N conducted the statistical analyses. The final version was critically revised and approved by all authors.

Clinical significance: Similar to health care workers, school teachers experience emotional reactions to their work during the COVID-19 pandemic, with potential negative consequences for behavior and willingness to work. Yet, teachers' emotional reactions can perhaps be reduced, if they are adequately addressed by local leaders and occupational health professionals.

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holidays) public schools were re-opened for the youngest pupils (0th [approx. 6 to 7 y old] to 5th grade [approx. 11 to 12 y old]). The re-opening of schools was conditioned on the adherence to guidelines regarding hand hygiene, regular disinfection, limitation of number of social contacts and social distance between pupils, for example, in the class rooms. During the data collection a re-opening was announced starting from the 18th of May for older pupils (6th grade [approx. 12 to 13 y old] to 10th grade [approx. 16 to 17 y old]). National data show that at the time of the initiation of the data collection, 10,260 individuals had been registered as infected with SARS-CoV-2, and 507 cases had died out of a population of 5.8 million people.

Study Population

The study population consisted of a random sample of the members of DLF, who were employed as teachers in public schools. In total, 10,000 members were contacted. Participants were eligible for inclusion if they were currently engaged in teaching either remotely or physically at the schools. Only teachers working (at least partly) outside of the specialized area (comprising children with special needs) were included. In total, 3026 (30%) responded to the questionnaire. Among these, 2673 respondents fulfilled the inclusion criteria. In the analyses for the present study, we excluded participants who were missing on sex and/or age ($n = 8$), and the final analytical sample consisted of 2665 teachers. Compared with DLF-members in general, the CLASS participants comprised slightly fewer men, and the younger age group (20 to 39 y) was underrepresented, while the older age groups (50 to 59 y and ≥ 60 y) were overrepresented.

Variables

Sociodemographic Factors

Information about sex, age and region was obtained from the DLF's members' register. Participants were asked about cohabitation status (Do you live together with...? Response options: My parents, Partner, Other adults, Children in 5th grade or younger, Children in 6th grade or older, I live alone). Participants were categorized in four groups according to their cohabitation status (Table 1).

Current Teaching

We obtained basic information about the participants' *current teaching responsibilities* (How is your teaching currently organized? Response options: Emergency teaching at the school, Emergency remote teaching, I do not teach currently [The latter group was excluded from the survey]), *physical presence* among participants who only reported remote teaching (Have you been physically present at the school in the period after the Easter holidays, for example, to attend meetings, pick up teaching materials, help colleagues etc. Response options: Yes, No), and the *pupils' grade* (What grades are you currently teaching? 0th grade...10th grade).

COVID-19 Management

Participants were asked: If you think about your current situation, do you agree or disagree with the following statements...? (1) At my workplace, we know which guidelines that we should adhere to in order to hinder spreading of virus during the COVID-19 epidemic; (2) At my workplace, we know when we should be tested for COVID-19; (3) I feel secure regarding my colleagues' actions to hinder spreading of virus (Response options: Highly agree, Agree, Neither agree nor disagree, Disagree, Highly disagree).

Furthermore, we asked if participants had access to necessary PPE (for example, sanitizer, soap, and gloves), and if they had been in close contact with pupils, colleagues or parents with a COVID-19 infection (Response options: Yes, No, Do not know).

Emotional Reactions to COVID-19

Participants were asked: If you think about your current situation, do you agree or disagree with the following statements...? (1) I worry about being physically present at my workplace; (2) I fear being infected with COVID-19 when at being at work; (3) I fear to transmit infection from my workplace to my home; (4) I fear transmitting infections to my pupils when being at work (Response options: Highly agree, Agree, Neither agree nor disagree, Disagree, Highly disagree).

Statistical Analyses

First, we provided baseline descriptive statistics of the study population. For descriptive purposes, we divided the participants into those who were responsible for emergency teaching at the school (potentially in combination with remote online teaching) and those who were only responsible for online remote teaching. Details about categorization of independent and dependent variables are illustrated in Table 1.

Second, we analyzed the association between COVID-19 risk management and emotional reactions to COVID-19. We used the *glm* procedure in STATA version 15.1 and estimated the association between COVID-19 risk management and emotional reactions to the pandemic. Associations were expressed as prevalence ratios (PR) and their 95% Confidence Intervals (CI). We did not use ordinal logistic regression as the assumption of proportional odds was violated for the original five-point Likert scales of the dependent variables (ranging from highly agree to highly disagree), although this method offers a more parsimonious use of data.

RESULTS

In this sample consisting of 2665 teachers employed at public schools in Denmark (Table 1), we found that the majority of the participants reported that at their workplace they had knowledge about COVID-19 guidelines and when to be tested for COVID-19, and felt secure about their colleagues' actions. Among those who carried out emergency teaching at the schools, 91% had access to necessary PPE, and 6% had been in close contact with an infected pupil, parent or colleague. The prevalence of worries about going to work was higher among those, who were solely responsible for remote teaching (34%) than among those who were teaching at the school (19%). Other emotional reactions, that is, fear of infection and transmission of infections, were equally frequent among those who carried out emergency teaching at the school and those who carried out remote online teaching.

When investigating the association of sociodemographic factors with emotional reactions to the COVID-19 pandemic (Table 2), we found that men had a lower prevalence of fear of transmission of infection to pupils. Participants aged 50 years or above more frequently reported worries about going to work and fear of infection. Fear of infection also appeared to be more frequent among teachers employed in Region Zealand, and fear of transmission of infection to pupils were higher among teachers outside the Capital Region. Not surprisingly, those living with other people (children and/or adults) more frequently feared transmitting infection from work to home.

Knowledge about guidelines was not significantly associated with any of the emotional reactions, yet, having knowledge about when to be tested was associated with a lower prevalence of worries about going to work as well as fear of infection and fear of transmission. Worries and fear were also less prevalent among teachers who felt secure about colleagues' actions and more prevalent among teachers without access to the necessary PPE, or who had been in close contact with an infected person.

TABLE 1. Baseline Distribution of Study Variables

	Emergency Teaching at the School* (N = 1,785)		Only Remote Online Teaching† (N = 880)	
	n	%	n	%
Sex (women)	1,446	81	586	67
Age				
<40 y	338	19	184	21
40–49 y	608	34	267	30
50–59 y	597	33	278	32
≥60 y	242	14	151	17
Region				
Capital region of Denmark	470	26	231	26
Region Zealand	249	14	153	17
North Jutland Region	192	11	89	10
Mid Jutland Region	462	26	211	24
Region of Southern Denmark	412	23	196	22
Cohabitation status				
Live alone	186	10	114	13
Only children	165	9	93	11
Only adults	659	37	324	37
Live with adults and children	775	43	349	40
Physically present (if not teaching at the school)				
No			375	43
Yes			505	57
Pupils grade (not mutually exclusive)				
Primary school (0th to 3rd grade)	1,006	56	29	3
Middle level (4th to 6th grade)	883	50	291	33
Secondary school (7th to 10th grade)	281	16	753	86
Knowledge about guidelines				
(Highly) disagree	33	2	25	3
Neither agree nor disagree	74	4	90	10
(Highly) agree	1,678	94	765	87
Knowledge about test				
(Highly) disagree	231	13	126	14
Neither agree nor disagree	350	20	265	30
(Highly) agree	1204	68	489	57
Feeling of security regarding colleagues' actions				
(Highly) disagree	170	10	41	5
Neither agree nor disagree	223	13	243	28
(Highly) agree	1,392	78	596	68
Access to necessary PPE				
Yes	1,624	91	495	56
No	127	7	30	3
Do not know	34	2	355	40
Has been in close contact with an infected pupil/parent/colleague				
No	1,181	66	698	79
Yes	113	6	28	3
Do not know	491	28	154	18
Worries about going to work				
(Highly) disagree & Neither agree nor disagree	1,440	81	585	67
(Highly) agree	345	19	295	34
Fear of infection‡				
(Highly) disagree & Neither agree nor disagree	1,133	63	317	36
(Highly) agree	652	37	188	21
Fear of transmitting infection from work to home‡				
(Highly) disagree & Neither agree nor disagree	895	50	268	30
(Highly) agree	890	50	237	27
Fear of transmitting infection to pupils during work‡				
(Highly) disagree & Neither agree nor disagree	1,223	68	366	42
(Highly) agree	562	32	139	16

For descriptive purposes, study participants are divided into those who are being physically present while teaching and those who are *only* teaching remotely.

*Potentially in combination with remote teaching.

†Only participants without any emergency teaching at the school.

‡Only asked to participants who had been physically present at the school with the purpose of teaching and/or attending meetings etc.

TABLE 2. The Association of Sociodemographic Factors and COVID-19 Risk Management with Emotional Reactions to the COVID-19 Pandemic Among Teachers in Denmark

	Worries About Going to Work (n = 2,665)			Fear of Infection (n = 2,290)			Fear of Transmitting Infection from Work to Home (n = 2,290)			Fear of Transmitting Infection to Pupils (n = 2,290)		
	PR	95% CI		PR	95% CI		PR	95% CI		PR	95% CI	
Sex (Ref: Women)												
Men	0.92	0.79	1.06	0.93	0.82	1.04	0.93	0.85	1.03	0.83	0.71	0.97
Age (ref: ≤39 y)												
40–49 y	1.06	0.86	1.30	1.07	0.92	1.25	0.95	0.85	1.06	0.93	0.79	1.10
50–59 y	1.30	1.08	1.56	1.17	1.01	1.36	0.96	0.85	1.07	0.86	0.72	1.03
≥60 y	1.30	1.02	1.63	1.15	0.95	1.39	0.95	0.82	1.11	0.89	0.71	1.13
Region (ref: capital region of Denmark)												
Zealand	1.14	0.96	1.36	1.36	1.18	1.57	1.05	0.93	1.18	1.31	1.08	1.59
North Jutland	0.95	0.74	1.23	1.16	0.96	1.41	1.10	0.95	1.26	1.41	1.14	1.74
Mid Jutland	1.01	0.85	1.20	1.05	0.91	1.22	0.95	0.85	1.06	1.21	1.01	1.44
Southern Denmark	1.00	0.84	1.20	1.04	0.90	1.21	0.99	0.89	1.11	1.18	0.98	1.42
Cohabitation (ref: live alone)												
Only children	1.14	0.86	1.50	1.08	0.86	1.35	1.47	1.19	1.82	1.03	0.77	1.38
Only adults	1.21	0.99	1.48	1.12	0.95	1.33	1.54	1.30	1.84	1.08	0.87	1.34
Adults + children	1.08	0.87	1.34	1.03	0.86	1.22	1.52	1.27	1.82	1.16	0.93	1.45
Knowledge about guidelines (ref: (highly) disagree)												
Neither agree nor disagree	0.99	0.76	1.32	1.00	0.78	1.30	1.01	0.82	1.25	1.19	0.76	1.87
(Highly) agree	0.97	0.76	1.25	0.99	0.79	1.25	0.99	0.83	1.20	1.20	0.80	1.79
Knowledge about test (ref: (highly) disagree)												
Neither agree nor disagree	0.86	0.72	1.01	0.80	0.69	0.92	0.86	0.77	0.97	0.79	0.66	0.95
(Highly) agree	0.81	0.69	0.95	0.81	0.72	0.93	0.87	0.79	0.97	0.81	0.69	0.95
Feeling of security regarding colleagues' actions (ref: (highly) disagree)												
Neither agree nor disagree	0.67	0.57	0.78	0.81	0.71	0.92	0.92	0.83	1.02	0.88	0.72	1.08
(Highly) agree	0.32	0.27	0.38	0.48	0.42	0.55	0.63	0.87	0.70	0.65	0.54	0.78
Access to necessary PPE (ref: yes)												
No	1.61	1.33	1.95	1.29	1.11	1.48	1.27	1.14	1.41	1.19	0.98	1.43
Do not know	1.85	1.58	2.17	1.22	1.04	1.42	1.16	1.02	1.31	1.10	0.88	1.37
Has been in close contact with an infected person (ref: no)												
Yes	1.67	1.35	2.05	1.41	1.17	1.70	1.36	1.18	1.56	1.38	1.09	1.75
Do not know	1.57	1.36	1.80	1.62	1.46	1.81	1.43	1.31	1.56	1.43	1.25	1.63

The variables in the table are mutually adjusted. Associations are presented as prevalence ratios (PR) and their 95% confidence intervals (CI). Statistically significant estimates are bold.

DISCUSSION

Main Findings and Comparison with Previous Research

We found that the prevalence of emotional reactions in the early phase of the COVID-19 pandemic was surprisingly high, both among teachers who were carrying out emergency teaching at the schools, and among those who carried out remote online teaching. We only succeeded in identifying a few international sources of data on teachers' perceptions during this pandemic. One paper contains Vietnamese data on teaching activities, perceived support, and the school's readiness towards digital transformation, but apparently no information about emotional responses to a perceived threat.⁸ One paper on Chinese data described that 9.1% of primary and secondary school teachers suffered from probable acute stress symptoms,⁹ and another paper on Chinese data reported that the prevalence of anxiety was 13.7% among teachers at all academic levels (from primary schools to university teachers). Yet, adjusted analyses showed that primary school teachers appeared to have the highest level of anxiety.¹⁰ A qualitative study including 20 teachers investigated the teachers' experience with remote online teaching during the school closure, and concluded that the school closure implied positive (eg, higher job control) as well as negative (eg, higher work-life imbalance) experiences.¹¹ Not surprisingly, another qualitative study including 8 teachers of children with special needs, that is,

refugees, found it particularly challenging to support their pupils during the school closure.¹² In a sample of 174 teachers in Denmark, 43% of the participants reported that they felt nervous or anxious due to the COVID-19 outbreak.¹³ In our sample, the prevalence of individuals reporting fear of infection or fear of transmitting infection from work to home, was similar to what we have observed among employees working within eldercare, childcare and hospital/rehabilitation, respectively.¹⁴ The prevalence of teachers, who feared transmitting infection to pupils, was comparable to the figures for employees in childcare, and lower than observed among employees in eldercare.¹⁴

Among teachers, knowledge about when to be tested and feeling secure regarding colleagues' actions were associated with a lower prevalence of emotional reactions, whereas lack of necessary PPE and having been in close contact with an infected person was associated with a higher prevalence of emotional reactions to the pandemic. Overall, these findings correspond with previous data on social- and health care helpers and assistants working in the eldercare.¹⁴

Interestingly, among those, who were teaching at the schools, 6% had been in contact with an infected person, which is similar to eldercare workers in Denmark, despite the considerable difference between the groups that they work with (ie, pupils vs elderly people).¹⁴ This finding should be understood in the context that there was a relatively high infection rate among elderly people in Denmark during the spring 2020. Although not directly comparable,

Baker et al estimated that in the US, 23% of workers within “Education, Training, and Library” are exposed to infection or disease more than once a month.¹⁵ Obviously, in our data, a considerable proportion did not know whether they had been in close contact with an infected person, which seems also to add to the emotional reactions. A recent review highlights that fear of infecting themselves or their families made health care workers follow infection prevention and control guidelines during previous respiratory disease pandemics.¹⁶ Yet, it has also been argued that whereas mild anxiety might be beneficial for the adherence to preventive behaviors, persistent anxiety or panic may yield more mistakes as well as irrational decisions.^{17–19} In all circumstances, adequate risk perception and knowledge about feasible and reasonable prevention of infection should be promoted.

Importantly, the appropriateness of school closures as a means to control the spreading of COVID-19 is debatable, particularly as evidence regarding the limited effect of school closures on the spread of virus is emerging.²⁰ Apparently, community facilities for children and adolescents do not represent a high risk environment per se, as children do not play a prominent role in the disease transmission dynamics of the current COVID-19 pandemic, and transmission of infection to children usually originates from infected adults.^{5,21} Thus, transmission patterns in children do not resemble patterns observed in seasonal influenza. Yet, when the data for the present study was collected this knowledge was not yet available, which may explain the prevalence of worries and fear among teachers. Health authorities’ communication of factual risk may be one of the strategies to reducing emotional reactions to the pandemic along with provision of adequate staff resources, PPE (such as hand sanitizer), and facilities (such as sufficient space to keep distance). Yet, the initial risk communication might have been hampered by, for instance, lack of scientific knowledge and disagreement among experts.²²

As a means of protection, hand hygiene, frequent cleaning of, for example, contact points, and social distance were implemented, whereas the option of using face shield was not implemented until the fall 2020. The majority of the participants, who were teaching at the schools, reported that they had access to the necessary PPE, which in this setting could be access to sanitizer, soap, and gloves. While younger children can be taught basic rule of hygiene including handwashing,⁵ it has been suggested that only for older children (above the age of 10 y), rules regarding social distance and more advanced guidelines about infection prevention can be implemented.⁵ A previous study on non-pharmaceutical interventions to prevent influenza transmission in elementary school concluded that general etiquette practices such as covering coughs, handwashing, and using hand sanitizer are highly acceptable among teachers, whereas, wearing face masks is not.²³ A barrier to the use of face masks in a health care setting is that it may scare children,¹⁶ which could also be the case in a school setting, particularly among younger pupils. In the CLASS study, 47% of the participants responded that the social distance had a negative effect on their relation to the pupils.²⁴ Possible explanations are that practical and socioemotional support—ie, core aspects of the pedagogical work—are hindered, when teachers are obliged to keep distance to the pupils.

Although knowledge about adequate test behavior seemed less satisfactory, teachers generally reported that they had sufficient knowledge about guidelines, particularly among those who were present at the school, and compared with health professionals they appear well-informed.^{25,26} Thus, management and health authorities seem to have succeeded in their communication to the teachers. Still, teachers are not expected to possess clinical knowledge of influenza pandemics, which has otherwise been shown to be associated with higher willingness to work during pandemics.²⁷ In this context, the emotional reactions among teachers are perhaps less frequent than expected.

Strengths and Limitations

It is a strength of the current study that we collected data during the partial COVID-19-related school closure in Denmark in the beginning of May 2020. These data were collected approximately 2 months after the first COVID-19 case was registered in Denmark. Through DLF, we had direct access to their members and were able to collect data with a short notice, while DLF provided us with updated knowledge about the school system’s response to COVID-19 in Denmark. Labor unions have a direct and unhindered access to their members and their legitimacy is high. Thus, partnerships between researchers and labor unions provide a unique opportunity for an agile data collection within extraordinary situations like the COVID-19 pandemic.

Data for the current study were collected with a research purpose, which is a strength of our study. Nevertheless, the short time frame for the development of the questionnaire and the continuously changing circumstances did not allow for a thorough validation of the questionnaire, particularly as scales assessing fear of COVID-19 have only recently been published.^{18,28} At the same time, knowledge about the effects on COVID-19 on frontline workers’ working environment is scarce, particularly outside of the hospital sector as most of the literature—perhaps not surprisingly—covers treatment, pandemic hotspots, governmental responses, and clinical patterns and complications of COVID-19.²⁹ Thus, we had limited evidence to build on. Nevertheless, our data cover important emotional aspects of working during a pandemic.³⁰

As we use cross-sectional data, causal inferences are not possible. For example, we found that the feeling of being secure about colleagues’ actions was related to emotional reactions to the pandemic. Yet, the direction of the association may be difficult to determine, as a higher “baseline level” of fear might result in a more critical view on colleagues’ compliance with guidelines. This finding emphasizes the potentially very important social aspect of managing fear of infection and transmission.

Despite the modest response rate, our study population is representative in terms of sex and region, while the younger age groups (<40 y) was under-represented and the older age groups (>50 y) were over-represented. Despite that cumulative incidence of confirmed COVID-19 cases per 100,000 individuals differed substantially between the Danish regions ranging from 70 in the North Denmark Region to 300 in the Capital Region,³¹ and participants therefore had different risk of infection, this fact did not seem to drive a skewed participation. We found no age group-differences in fear of transmission, whereas the two oldest age groups had higher odds of worrying about going to work and of fear of infection. In a local language report, we analyzed whether there was an association between important indicators of COVID-19-related well-being and accepting to being contacted again by the research team, and we found no systematic association between being more or less positive and the odds of wanting to participate in future studies.

CONCLUSION AND PRACTICAL IMPLICATIONS

In conclusion, public school teachers’ experience of fear of infection and transmission of infection is remarkably similar to the emotional reactions in job groups taking care of sick and elderly people. Furthermore, also for teachers, knowledge about adequate test behavior, access to PPE, and protection from contact with infected individuals as well as indicators of trust (here: feeling secure regarding colleagues’ actions) generally tend to be related to a lower prevalence of fear of infection and fear of transmission. Thus, we propose that these risk management variables may be related to fear across different job groups, although more studies in other job groups are needed to confirm the generalizability of these findings. Here and now, adequate risk perception should be promoted by proper communication of factual risk and clear guidelines for prevention of the spread of COVID-19 in order to promote the

feeling of a safe environment and prevent long-term fear and anxiety with potential counterproductive consequences.

These findings are of particular importance, as the society is heavily depending on teachers' willingness to work also during a pandemic, and the individual teacher has to manage a potential intrapersonal conflict between the duty to go to work versus the duty to protect the family from infection,^{30,32} particularly, as the job requires numerable social contacts and social distance might be difficult to keep. The possibility of opting out of work is perhaps not a genuine possibility for the teachers. Nonetheless, the society in general and the workplaces specifically have to manage emotional reactions to the pandemic among different groups of frontline employees.

REFERENCES

1. Sim MR. The COVID-19 pandemic: major risks to healthcare and other workers on the front line. *Occup Environ Med.* 2020;77:281–282.
2. Burdorf A, Porru F, Rugulies R. The COVID-19 (Coronavirus) pandemic: consequences for occupational health. *Scand J Work Environ Health.* 2020;46:229–230.
3. The plight of essential workers during the COVID-19 pandemic. *Lancet.* 2020;395:1587.
4. Belingheri M, Paladino ME, Riva MA. COVID-19: health prevention and control in non-healthcare settings. *Occup Med (Lond).* 2020;70:82–83.
5. Walger P, Heining U, Knuf M, et al. Children and adolescents in the CoVid-19 pandemic: Schools and daycare centers are to be opened again without restrictions. The protection of teachers, educators, carers and parents and the general hygiene rules do not conflict with this. *GMS Hyg Infect Control.* 2020;15:Doc11.
6. Xiang YT, Yang Y, Li W, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet Psychiatry.* 2020;7:228–229.
7. Preskorn SH. The 5% of the population at high risk for severe COVID-19 infection is identifiable and needs to be taken into account when reopening the economy. *J Psychiatr Pract.* 2020;26:219–227.
8. Vu CT, Hoang AD, Than VQ, et al. Dataset of Vietnamese teachers' perspectives and perceived support during the COVID-19 pandemic. *Data Brief.* 2020;31:105788.
9. Zhou X, Yao B. Social support and acute stress symptoms (ASSs) during the COVID-19 outbreak: deciphering the roles of psychological needs and sense of control. *Eur J Psychotraumatol.* 2020;11:1779494.
10. Li Q, Miao Y, Zeng X, Tarimo CS, Wu C, Wu J. Prevalence and factors for anxiety during the coronavirus disease 2019 (COVID-19) epidemic among the teachers in China. *J Affect Disord.* 2020;277:153–158.
11. Bredgaard T, Hansen CD, Kylling A-B, Hørby Jørgensen J. *Nedlukningen: Corona-krisen, arbejdslivet og den mentale sundhed.* Aalborg: Aalborg Universitet; 2020.
12. Primdahl NL, Borsch AS, Verelst A, Jervelund SS, Derluyn I, Skovdahl M. 'It's difficult to help when I am not sitting next to them': How COVID-19 school closures interrupted teachers' care for newly arrived migrant and refugee learners in Denmark. *Vulnerable Child Youth Stud.* 2020. Epub Ahead of Print.
13. Qvortrup A, Lundtofte TE, Lomholt R, Christensen V, Nielsen A. *Børns socio-emotionelle tilstand under genåbningen af skoler efter COVID-19 nedlukningen: Data rapport—dansk.* Syddansk Universitet; 2020.
14. Nabe-Nielsen K, Nilsson CJ, Juul-Madsen M, Bredal C, Hansen LOP, Hansen ÅM. COVID-19 risk management at the workplace, fear of infection and fear of transmission of infection among frontline employees. *Occup Environ Med.* 2020. Online ahead of print.
15. Baker MG, Peckham TK, Seixas NS. Estimating the burden of United States workers exposed to infection or disease: a key factor in containing risk of COVID-19 infection. *PLoS One.* 2020;15:e0232452.
16. Houghton C, Meskell P, Delaney H, et al. Barriers and facilitators to healthcare workers' adherence with infection prevention and control (IPC) guidelines for respiratory infectious diseases: a rapid qualitative evidence synthesis. *Cochrane Database Syst Rev.* 2020;4:Cd013582.
17. Ahmed MA, Jouhar R, Ahmed N, et al. Fear and practice modifications among dentists to combat novel coronavirus disease (COVID-19) outbreak. *Int J Environ Res Public Health.* 2020;17:2821.
18. Ahorsu DK, Lin CY, Imani V, Saffari M, Griffiths MD, Pakpour AH. The fear of COVID-19 scale: development and initial validation. *Int J Ment Health Addict.* 2020. Online ahead of print.
19. Halperin DT. Coping with COVID-19: learning from past pandemics to avoid pitfalls and panic. *Glob Health Sci Pract.* 2020;8:155–165.
20. Viner RM, Russell SJ, Croker H, et al. School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *Lancet Child Adolesc Health.* 2020;4:397–404.
21. Ghinai I, Woods S, Ritger KA, et al. Community transmission of SARS-CoV-2 at two family gatherings—Chicago, Illinois, February–March 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69:446–450.
22. Leask J, Hooker C. How risk communication could have reduced controversy about school closures in Australia during the COVID-19 pandemic. *Public Health Res Pract.* 2020;30:e3022007.
23. Stebbins S, Downs JS, Vukotich Jr CJ. Using nonpharmaceutical interventions to prevent influenza transmission in elementary school children: parent and teacher perspectives. *J Public Health Manag Pract.* 2009;15:112–117.
24. Nabe-Nielsen K, Larsen I, Fuglsang NV, Nilsson CJ. *CLASS—et forskningssprojekt om COVID-19's betydning for Læreres Arbejdsmiljø, Sammehold og Smitteoplevelse.* København: Københavns Universitet; 2020.
25. Prescott K, Baxter E, Lynch C, Jassal S, Bashir A, Gray J. COVID-19: How prepared are front line healthcare workers in England? *J Hosp Infect.* 2020;105:142–145.
26. Shi Y, Wang J, Yang Y, et al. Knowledge and attitudes of medical staff in Chinese psychiatric hospitals regarding COVID-19. *Brain Behav Immun Health.* 2020;4:100064.
27. Aoyagi Y, Beck CR, Dingwall R, Nguyen-Van-Tam JS. Healthcare workers' willingness to work during an influenza pandemic: a systematic review and meta-analysis. *Influenza Other Respir Viruses.* 2015;9:120–130.
28. Bitan DT, Grossman-Giron A, Bloch Y, Mayer Y, Shiffman N, Mendlovic S. Fear of COVID-19 scale: psychometric characteristics, reliability and validity in the Israeli population. *Psychiatry Res.* 2020;289:113100.
29. Tran BX, Ha GH, Nguyen LH, et al. Studies of novel coronavirus disease 19 (COVID-19) pandemic: a global analysis of literature. *Int J Environ Res Public Health.* 2020;17:4095.
30. McConnell D. Balancing the duty to treat with the duty to family in the context of the COVID-19 pandemic. *J Med Ethics.* 2020;46:360–363.
31. COVID-19 i Danmark: Epidemiologisk overvågningsrapport 06-05-2020—data opdateret kl. 08:00. København: Statens Serum Institut, 2020. Available at: <https://files.ssi.dk/COVID19-overvågningsrapport-06052020-pp5f>. Accessed November 10, 2020.
32. Koh Y, Hegney DG, Drury V. Comprehensive systematic review of healthcare workers' perceptions of risk and use of coping strategies towards emerging respiratory infectious diseases. *Int J Evid Based Healthc.* 2011;9:403–419.