

How Risk Management During COVID-19 Influences Eldercare Personnel's Perceptions of Their Work Environment

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Objective: To investigate the association between workplace COVID-19 (coronavirus disease 2019) risk management and eldercare workers' perception of their social environment at work. **Methods:** Cross-sectional questionnaire data from 952 participants were collected by the Danish labor union, FOA, and analyzed using multinomial logistic regression. **Results:** Unclear guidelines, insecurity regarding organization of work, lack of attention to vulnerable employees, and lack of instruction in the use of personal protective equipment were associated with perceived negative changes in the social environment at work. Also, higher local incidence rates of SARS-CoV-2 infections were associated with a weaker sense of community (odds ratio, 1.18; 95% confidence interval, 1.04–1.36). **Conclusions:** These findings indicate that risk management is important not only for prevention of infection but also for individual and workplace resilience toward external demands and health threats.

KEYWORDS: COVID-19, eldercare workers, leadership, occupational health, social environment at work

During the COVID-19 pandemic (coronavirus disease 2019), front-line employees working in various societal institutions rapidly implemented new routines and everyday practices to hinder spread of infection among pupils, clients, and patients.^{1,2} Although the consequences for the mental health and working environment among front-line employees have received attention,^{3–7} the majority of occupational health research during the pandemic has focused on hospital staff.

The death toll in nursing homes for elderly people in Denmark has been low compared with other countries, yet 39% of all COVID-19–related deaths in Denmark have been in nursing homes.⁸ As they were implementing new initiatives and practices to hinder spread of SARS-CoV-2 infection, the eldercare sector has concurrently experienced shortage of staff, lack of personal protective equipment (PPE),

and increased time pressure.⁹ Worldwide, eldercare workers have been confronted by new ethical dilemmas of balancing safety procedures versus ensuring the quality of life of the elderly.¹⁰ At the same time, the public discourse and press coverage might have contributed to stigmatization of eldercare workers as potential carriers of infection.^{11–13} Thus, eldercare workers have been exposed to several occupational stressors and risk factors for adverse mental health outcomes during the pandemic.¹⁴

Lack of risk management in terms of unclear communication, information, and instruction; poor organization of work and ad hoc solutions; insufficient monitoring; training and infection control procedures; and lack of resources, such as PPE, are occupational stressors, which seem to increase adverse mental health outcomes among health care workers during a virus outbreak.^{14–18} Studies performed in other occupational settings indicate that workplace rumors concerning organizational changes and lack of two-way communication between managers and employees about expected work roles are associated with higher role ambiguity, emotional exhaustion, and job insecurity during the COVID-19 pandemic.^{19,20} Oppositely, transformational leadership seems to be associated with lower role ambiguity, particularly among employee with low involvement in changes and decisions.²¹

Also, supportive relations at work buffer the effects on mental health during crises,^{22,23} which in this sense enhance the individual and organizational resilience. Because of the need of such buffering social relations, it is important to gain knowledge about factors that determine these during crises. Such knowledge contributes to the literature by providing an understanding of the ways organizations can preserve the social environment at work during crises, for example, by their risk management practices. Furthermore, because of the buffering effect of social relations at work, the findings of this study have implications for the prevention of negative mental health outcomes among employees in the eldercare sector.

Against this background, the aim of this study was to investigate if the level of risk management during the initial phase of the COVID-19 pandemic affected the social environment at work. More specifically, we assessed the association of eight indicators of COVID-19 risk management with the perceived changes in conflicts and sense of community among eldercare workers. Furthermore, we hypothesized that workplaces' COVID-19 risk management was particularly important in situations where the external health threat, operationalized as the local SARS-CoV-2 infection rate, was high. Therefore, we also investigated if the association between COVID-19 risk management and perceived changes in the social environment at work depended on the local infection rates in the municipalities, where the workplaces were located.

METHODS

Context, Study Design, Data Collection, and Study Population

Cross-sectional data were collected by the labor union, FOA. FOA is the third largest labor union in Denmark, organizing approximately 175,000 members primarily in the public sector. Data were collected from June 16 to July 6, 2020, approximately 3 months after the first SARS-CoV-2–infected case was identified in Denmark. In total, 10,289 currently occupationally active individuals from FOA's voluntary

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member panel were invited to participate in an electronic questionnaire survey distributed through e-mail. Responses were treated confidentially.

In total, 3624 individuals (response rate, 35%) responded to the questionnaire (Fig. 1). To be eligible for inclusion in the present study, participants had to work in the eldercare as social and health care helper (SHH) or assistant (SHA) (SHHs and SHAs differ in duration of education, and often SHAs have more responsibility for the medication of patients than SHHs²⁴). Furthermore, to be eligible for inclusion, participants should be physically present at their workplace during work, be employed in a municipality, and work in homecare, in a nursing home, or in an activity center. We excluded participants who worked as leaders. We also excluded participants who responded “Not relevant instead of or “I have not been at work in the past week” to questions about COVID-19 risk management or “Do not know” to questions about the social environment at work.

Social Environment at Work

To assess the perceived changes in conflicts at work, the participants were asked, “Do you experience more or less conflicts at work compared with before the COVID-19 pandemic?” with the response options: “more,” “around the same amount,” and “less.”

Perceived changes in sense of community among colleagues were assessed by asking the participants: “Has the sense of community among colleagues become stronger or weaker during the COVID-19

pandemic?” with the response options: “It has become stronger,” “It is approximately the same,” and “It has become weaker.”

COVID-19 Risk Management at the Workplace

To assess the COVID-19 risk management at the workplace, the participants were asked to indicate if they agreed or disagreed with the following statements: (1) “Management has communicated clear guidelines regarding how employees should act at the workplace during the COVID-19 pandemic”; (2) “I feel secure regarding how my workplace organizes and plans the work during the COVID-19 pandemic”; (3) “My workplace is well-prepared to perform work tasks during the COVID-19 pandemic”; and (4) “The management monitors if the guidelines for the use of PPE are being followed.” The response options were “totally agree,” “partly agree,” “disagree,” “totally disagree” and “do not know.” Response categories were dichotomized, so that “totally agree” and “partly agree” were referred to as “agree.” “Disagree,” “totally disagree,” and “do not know” were referred to as “disagree” as we assumed that COVID-19 risk management was inadequate if the respondents did not know if it was the case or had taken place.

Participants were asked if their workplace paid attention to employees who were particularly vulnerable toward COVID-19. Participants were asked to indicate if their workplace paid attention to six different risk groups listed in the guidelines issued by the Danish Health Authorities: people 80 years or older, people with chronic diseases (eg, cardiovascular disease, lung disease, or diabetes), pregnant women,

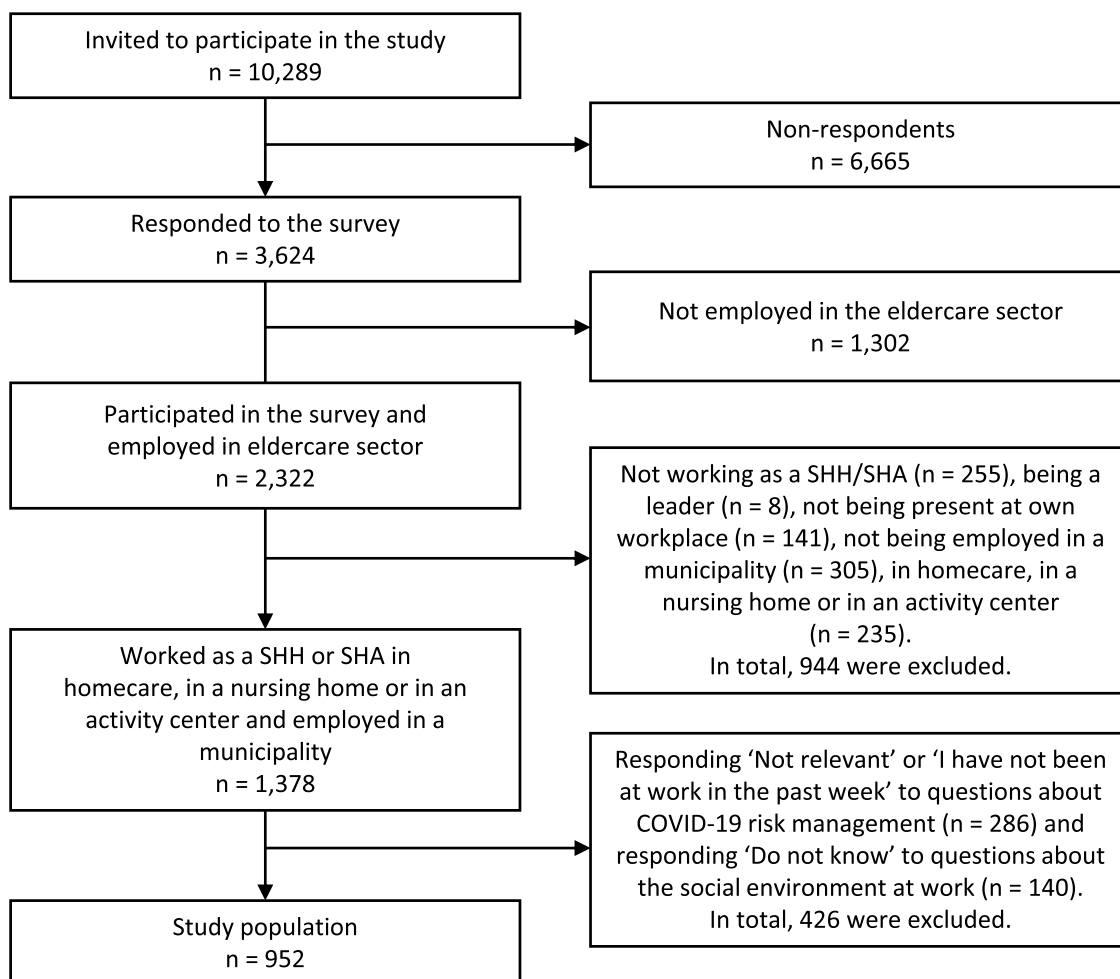


FIGURE 1. Flowchart of the selection of study participants.

people with a body mass index of 35 kg/m² or greater, people with a body mass index of 30 kg/m² or greater who also have a chronic disease, and other risk groups.²⁵ The variable was dichotomized into those who reported “lack of attention to 0–1 group” and those who reported “lack of attention to 2–6 groups.”

Participants were asked if they had received instruction in the use of PPE. Participants were also asked to indicate if they in the past week had experienced lack of access to PPE. Furthermore, participants were asked to indicate if their workplace had received the resources needed to live up to the Danish Health Authorities guidelines. The response options for these questions were “yes,” “no,” and “do not know.” We dichotomized the response categories into “yes” and “no.” Respondents reporting “do not know” were included in the response option “no.”

COVID-19 Risk Management Index

We hypothesized that the eight indicators of COVID-19 risk management in our study could be used to construct an index to assess the scope of the workplaces' risk management. Each of the eight indicators included in our risk management index have previously been shown to be associated with mental health outcomes among health care workers during the COVID-19 pandemic.^{14–18} As such, the indicators have more generally been related to these workers' well-being and functioning.

An overall index for poor COVID-19 risk management was created by calculating a sum score of the eight dichotomized risk management variables (range, 0 to 8), with higher scores indicating poorer risk management. Thus, the index assessed the numbers of actions not taken by the workplaces to handle the COVID-19 pandemic and did not, as such, reflect an underlying “risk management construct” as would have been the underlying assumption when creating a scale.²⁶

Local Incidence Rates of SARS-CoV-2 Infections

For each participant, we obtained information about the local cumulative incidence rates of SARS-CoV-2 infections in the municipality of his/her workplace. These data stem from the Danish authorities of Infectious Disease Control (Danish: *Statens Serum Institut*). Data included information about each of the 98 municipalities in Denmark, and we used data from the offset of the pandemic in Denmark from January 27 to June 16, 2020, where the data collection was initiated.

Sociodemographic Factors and Fear of Infection

Information about area of work (homecare, nursing home, or activity center) was self-reported. Information about sex, age, municipality of workplace, and job title (SHH, SHA) was obtained from the member's register. Table 1 presents the distribution of the study variables.

In sensitivity analyses, we included *fear of infection*, which was assessed with the question: “To what degree do you fear to be infected with COVID-19 during work?” with the response options: “not at all,” “to a small degree,” “to some degree,” and “do not know” (reference) versus “to a high degree” and “to a very high degree.”

Statistical Analyses

First, we analyzed the distribution of all covariates and the social environment at work across the COVID-19 risk management index. For descriptive purpose, we trichotomized the risk management index into high (scores 0 to 1), moderate (scores 2 to 3), and low risk management (scores 4 to 8) and presented the distribution of covariates across these groups (Table 1). Furthermore, we analyzed the mean score of the local cumulative incidence rates (Table 1).

TABLE 1. Description of the Study Population and Local Incidence Rates Across Levels of COVID-19 Risk Management

	Level of Perceived COVID-19 Risk Management*							
	Total (n = 952)		High (Scores 0–1) (n = 383)		Moderate (Scores 2–3) (n = 400)		Low (Scores 4–8) (n = 169)	
	n	%	n	%	n	%	n	%
Sex								
Women	908	95.4	364	95.0	385	96.2	159	94.1
Men	44	4.6	19	5.0	15	3.8	10	5.9
Age								
≤39 y	112	11.8	32	8.4	56	14.0	24	14.2
40–49 y	176	18.5	73	19.1	79	19.8	24	14.2
50–59 y	440	46.2	180	47.0	176	44.0	84	49.7
≥60 y	224	23.5	98	25.6	89	22.3	37	21.9
Job title								
SHA	520	54.6	217	56.7	211	52.7	92	54.4
SHH	432	45.4	166	43.3	189	47.3	77	45.6
Type of workplace								
Homecare	380	39.9	130	33.9	167	41.7	83	49.1
Nursing home/activity center	572	69.1	253	66.1	233	58.3	86	50.9
Conflicts among colleagues								
Less	94	9.9	49	12.8	37	9.3	8	4.7
Same amount	709	74.5	287	74.9	298	74.5	124	73.4
More	149	15.7	47	12.3	65	16.3	37	21.9
Sense of community								
Weakened	105	11.0	30	7.8	47	11.8	28	16.6
The same	647	68.0	265	69.2	269	67.3	113	66.9
Strengthened	200	21.0	88	23.0	84	21.0	28	16.6
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Cumulative incidence rate of SARS-CoV-2 infection	168.4	141.8	160.0	135.4	177.2	149.6	166.7	136.7

*A higher score indicates poorer risk management.

COVID-19, coronavirus disease 2019; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2; SHA, social and health care assistant; SHH, social and health care helper.

Second, we analyzed the association between COVID-19 risk management indicators and the perceived change in the social environment at work using multinomial logistic regression, thereby allowing for a nonbinary dependent variable (Table 2). In these analyses, all the measures of COVID-19 risk management were included as binary independent variables. For each COVID-19 risk management variable, the category of “agree”/“yes”/“lack of attention to 0–1 group” was used as the reference group. Analyses were adjusted for socio-demographic factors. All associations are expressed as odds ratios with their 95% confidence intervals. In all analyses, perceived changes in conflicts at work and sense of community among colleagues were included as dependent variables. We calculated the odds of reporting “more” or “less” conflicts as opposed to reporting “the same amount,” and “weakened” or “strengthened” sense of community as opposed to reporting “it is approximately the same.”

Third, we analyzed the association of the local cumulative incidence rates of SARS-CoV-2 infections and the risk management index with perceived changes in the social environment at work (Table 3, model 1). Results are expressed as the increase/decrease in odds for more/less conflicts and strengthened/weakened sense of community per 100 additional cases per 100,000 individuals. Furthermore, we controlled for the risk management index in the model and estimated the increase/decrease in odds per one-unit increase in the risk management index (Table 3, model 2). Finally, we included the interaction between incidence rates and risk management to investigate the moderating effect of the local incidence rates on the association between COVID-19 risk management and the perceived changes in the social environment at work (Table 3, model 3).

In sensitivity analyses of the association between the incidence rates and risk management index and the perceived change in the social environment at work, we repeated model 2 with the addition of fear of infection. Furthermore, we stratified analyses of this association across age groups.

RESULTS

Participants did not differ systematically across the three levels of COVID-19 risk management in terms of sex, age, and job title (Table 1). The percentage of employees in homecare was higher among participants reporting poorer COVID-19 risk management (Table 1). We did not find a systematic difference in mean incidence rates across levels of COVID-19 risk management.

Reporting poorer COVID-19 risk management was associated with higher odds of perceived negative changes in conflicts and sense of community for four of eight indicators of risk management (Table 2). More specifically, unclear guidelines, insecurity regarding

organization of work, lack of attention to vulnerable employees, and lack of instruction in the use of PPE were significantly associated with more conflicts at work and a weaker sense of community (Table 2).

We observed no association between the local incidence rates of SARS-CoV-2 infections and neither conflicts among colleagues nor sense of community. Instead, we found significantly higher odds of more conflicts and weaker sense of community when scoring higher on the risk management index indicating a poorer risk management (Table 3, model 1). Furthermore, we found no statistically significant interaction between the risk management index and the incidence rates on conflicts or sense of community among colleagues (Table 3, model 3). Therefore, we report the findings from model 2 (Table 3). Like in model 1, we found that reporting poorer risk management was significantly associated with higher odds of more conflicts and lower odds of fewer conflicts (Table 3, model 2). In addition, reporting a poorer risk management or working in a municipality with high incidence rates was significantly associated with a weaker sense of community among colleagues. We found minimal changes in the estimates of model 2, when adjusting for fear of infection. Our age-stratified analyses of model 2 showed that the association between poorer risk management and a weaker sense of community was driven by the oldest age group (aged ≥60 years) in which we found an odds ratio of 1.53 (95% confidence interval, 1.12 to 2.09).

DISCUSSION

Main Findings

We found that inadequate COVID-risk management was associated with perceived changes in the social environment at work, in terms of more conflicts and a weaker sense of community among colleagues. When analyzed separately, four indicators of COVID-19 risk management stood out as being significantly associated with the social environment at work: unclear guidelines, insecurity regarding organization of work, lack of attention to vulnerable employees, and lack of instruction in the use of PPE.

Working in a municipality with a higher incidence rate of SARS-CoV-2 infections was associated with a perceived weaker sense of community, when adjusted for COVID-19 risk management. Yet, our results did not support the hypothesis that adequate risk management was particularly important in a context where the external health threat (ie, the incidence rate) was higher.

Comparison With Previous Findings

We observed that inadequate risk management was associated with perceived negative changes in the social environment at work

TABLE 2. Associations Between Each of the Eight Indicators of COVID-19 Risk Management and Participants' Perception of Changes in Conflicts and Sense of Community Among Colleagues During the COVID-19 Pandemic

	Conflicts				Sense of community			
	Fewer		More		Stronger		Weaker	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Unclear guidelines	0.31	0.94–1.01	2.40	1.45–3.95	0.63	0.34–1.15	1.99	1.13–3.50
Insecurity regarding organization of work	0.47	0.22–1.00	2.37	1.57–3.60	0.61	0.38–1.64	2.28	1.43–3.62
Not well-prepared to perform work tasks	0.90	0.52–1.56	0.94	0.60–1.48	0.90	0.60–1.35	0.92	0.56–1.55
Lack of monitoring of adherence to guidelines	0.97	0.62–1.49	1.11	0.78–1.59	0.93	0.67–1.28	0.85	0.56–1.30
Lack of attention to risk groups	0.65	0.34–1.23	2.31	1.53–3.48	1.16	0.78–1.74	1.93	1.20–3.08
Lack of PPE instruction	0.59	0.33–1.06	1.89	1.28–2.78	0.64	0.43–0.96	2.08	1.35–3.21
Lack of access to PPE	0.48	0.17–1.36	0.63	0.30–1.33	1.23	0.67–2.25	1.48	0.71–3.08
Lack of resources	1.00	0.64–1.56	0.78	0.54–1.12	1.27	0.91–1.78	0.88	0.58–1.34

All associations are expressed as ORs) with their 95% CIs. All associations are adjusted for sex, age, job title, and type of workplace. COVID-19, coronavirus disease 2019; CI, confidence interval; OR, odds ratio; PPE, personal protective equipment.

TABLE 3. Associations of Incidence Rates of SARS-CoV-2 Infections per 100,000 Individuals and the Risk Management Score With the Perception of Changes in Conflicts and Sense of Community Among Colleagues During the COVID-19 Pandemic

	Conflicts				Sense of Community			
	Fewer		More		Stronger		Weaker	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Model 1*								
Incidence rate	0.99	0.85–1.16	0.96	0.85–1.10	0.99	0.85–1.16	0.96	0.85–1.10
Risk management	0.85	0.72–0.99	1.21	1.07–1.35	0.95	0.85–1.06	1.21	1.06–1.37
Model 2†								
Incidence rate	0.99	0.85–1.16	0.96	0.85–1.10	1.10	0.98–1.23	1.18	1.04–1.36
Risk management	0.85	0.72–0.99	1.21	1.08–1.35	0.95	0.85–1.06	1.20	1.05–1.37
Model 3‡								
Incidence rate	1.13	0.88–1.43	0.90	0.70–1.16	1.10	0.91–1.33	1.07	0.82–1.40
Risk management	0.95	0.75–1.21	1.16	0.97–1.39	0.95	0.80–1.13	1.12	0.91–1.14
Interaction term	0.93	0.83–1.05	1.03	0.94–1.12	1.00	0.92–1.75	1.04	0.95–1.14

All associations are expressed as ORs with their 95% CIs. A higher score indicates poorer risk management. The OR for “incidence” expresses the increase/decrease in odds associated with 100 additional cases per 100,000 individuals.

*Adjusted for sex, age, job title, and type of workplace. Incidence rate and risk management are not mutually adjusted.

†Adjusted for sex, age, job title, and type of workplace and risk management score. Incidence rate and risk management are mutually adjusted.

‡Model 2 plus interaction term (risk management × incidence rate).

CI, confidence interval; COVID-19, coronavirus disease 2019; OR, odds ratio; PPE, personal protective equipment; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

among eldercare personnel during the COVID-19 pandemic. Previous studies suggest that lack of risk management can also have other consequences for frontline employees in the health care and eldercare sector: A recent study found that unclear communication and vague division of responsibilities increased fear of infection among eldercare workers during COVID-19.¹⁷ Among other groups of health care workers, insufficient access to PPE, unclear rules regarding the use and management of PPE, and limited specialized training in handling COVID-19 patients have been shown to increase anxiety coming from the perceived unfamiliarity and uncontrollability of the hazards involved.^{14–16} Another study found that lack of trust in equipment and infection control procedures predicted higher levels of emotional exhaustion and state anger and that limited specialized training and unpreparedness were associated with symptoms of burnout and posttraumatic stress disorder.¹⁸ Together, these findings indicate that inadequate risk management has various negative effects on well-being and mental health of health care workers with possible implications for their (clinical) practices. Thus, lack of risk management might reduce the resilience of both employees and organizations during crises.

It is well established that (lack of) social relations are associated with various health outcomes, such as all-cause mortality, self-rated health, mental well-being, and cardiovascular function.^{27–31} For example, the sense of belonging is strongly associated with mental health outcomes, including depression, loneliness, and social anxiety.³² In the context of our findings, a poorer social environment at work might increase the risk of several negative health outcomes for the individual. One potential pathway through which social factors influence health is by buffering the affective and physiological stress reactivity.³³ During the COVID-19 pandemic, a recent study of other frontline employees outside the health care sector found that supervisor support eased emotional exhaustion among employees and that coworker support could even protect against the negative effects of inadequate risk management on mental health, for example, by addressing uncertainties fostered by unclear crisis communication.²² Together, these findings indicate that social relations might buffer the negative effects of working in the health care and eldercare sector during the COVID-19 pandemic.^{14–18} Thus, in the context of our findings, more knowledge on ways to support organizations to provide adequate risk management is needed to improve the resilience of health care workers through support of a good social environment and thereby their ability of handling the crisis.

Strengths and Limitations

The study is strengthened by the timing of the data collection, which was initiated approximately 3 months after the first lockdown of the Danish society as a response to the COVID-19 pandemic. The data collection was administered by the labor union, FOA, which has a direct and unhindered access to its members. Because of the legitimacy of labor unions among their members, their involvement enhances an agile data collection during extraordinary situations. The drawback, though, is that our data were not collected with a research purpose, which has had implications for the tools used to assess risk management and the social environment at work. To avoid excluding participants responding “do not know” to questions about risk management, we decided to include these respondents in the group that did not confirm, for example, that guidelines were clear, that management monitored adherence to guidelines, that they had access to PPE, and so on. This decision may have resulted in an underestimation of the difference between exposed and unexposed participants.

A major strength of our study is the inclusion of local incidence rates of SARS-CoV-2 cases, as it enabled us to include an objective indicator of the actual external health threat in our analyses. However, because of the low number of individuals being screened for an infection with SARS-Cov-2 in the first phases of the pandemic, the recorded incidence rates are most likely seriously underreported. Yet, as this underreporting was apparent in all municipalities, we expect that this did not substantially inflict on our results. Theoretically, it could be postulated that the risk management strategies applied in the present study would affect the local incidence rates, thereby making this variable take on the role as a mediator. Yet, a recent study investigating the effect of infection control strategies among health care workers found that universal masking only decreased the SARS-CoV-2 incidence trend among health care workers, while the infection rate continued to rise in the surrounding community.³⁴ Thus, we assume that the incidence rate is not a result of the COVID-19 risk management.

Because of our cross-sectional design, we cannot, however, preclude a bidirectional relationship between the included variables in terms of reverse causation; that is, it is possible that the social environment at work affected how effectively the organization's risk management was implemented, for example, diffusion of information. Furthermore, because of self-reported data, we cannot rule out potential bias due to differential misclassification of dependent and independent

variables; for example, it is plausible that participants who have experienced a high number of conflicts are more likely to recall inadequate risk management, leading to stronger estimates of associations with poor social environment. In addition, our data were collected when the incidence rates were relatively low. This has possibly decreased the participants' awareness and perception of the necessity of COVID-19 risk management. Thus, the timing of data collection might have impacted on the participants' responses.

We adjusted for sex, age, job title, and type of workplace and included only participants who were physically present at their workplace and worked in homecare, at a nursing home or in an activity center as a SSH or SSA. Thus, our analytical sample was relatively homogeneous in terms of job title and type of work area, which we expect, to some extent, reduced the risk of unmeasured confounding. Still, during the COVID-19 pandemic, the mental health of health care workers has been a major concern.^{18,35} Therefore, in sensitivity analyses, we adjusted for fear of infection and found minimal changes in our estimates.

FOA organizes 79% to 85% of all SSHs and SSAs in Denmark. Our analytical sample was representative of FOA's members in terms of sex, but younger members were underrepresented.³⁶ Age-stratified analyses, however, showed that the association between poorer risk management and a weaker sense of community was driven by the oldest age group. Thus, the age distribution in our analytical sample may have contributed to an overestimation of this association. Other studies have found age differences in adverse mental health outcomes among health care workers during the COVID-19 pandemic. Yet, whereas one study showed that health care workers 40 years or older reported higher levels of psychosocial distress,³⁷ another study found that younger age was associated with mental health issues such as symptoms of depression and anxiety and posttraumatic stress syndrome.³⁸

Other groups of health care workers are found to experience several work-related stressors (eg, more patients and lack of resources)³⁹ and negative mental health outcomes due to inadequate risk management¹⁷ during the COVID-19 pandemic. Thus, we expect that our findings can be generalized to other groups of employees working in the health care during a pandemic. In addition, we suggest that future studies explore potential subgroup differences, for example, differences across age groups.

CONCLUSION

Our data provide knowledge about COVID-19 risk management among frontline employees working in the eldercare sector. We found that inadequate COVID-19 risk management was associated with perceived negative changes in the social environment at work when controlled for local SARS-CoV-2 infections rates in the municipality of the participants' workplaces, and older employees seemed to be particularly vulnerable.

When analyzed individually, we found that four indicators of COVID-19 risk management stood out as being significantly associated with perceived changes in the social environment at work, namely, unclear guidelines, insecurity regarding organization of work, lack of attention to vulnerable employees, and lack of instruction in the use of PPE. Thus, our results pinpoint four specific aspects of risk management that could be important not only for the prevention of infection but also in relation to the social environment at work among eldercare personnel.

The implications of these findings, given that we assume at least some degree of causality, are that not only can the workplace's risk management influence the employees' risk of infection, but risk management seems also to be related to the social environment at work. This knowledge is important, as supportive social relations are found to buffer the negative effects of COVID-19-related stressors at work on the mental health among health care workers.

A well-functioning workforce and social environment at work are fundamental for the societal response to the pandemic within its institutions and workplaces, as the response requires efforts and collaboration among the involved employees. Our results can be useful for the understanding of how to build up the "social resilience" of workplaces and how this can go hand in hand with COVID-19 risk management as well as being instrumental in the improvement of mental health among employees.

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