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Research paper

Healthcare in distress: A survey of mental health problems and the role of gender among nurses and physicians in Sweden

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ABSTRACT

Introduction: The present article aimed to investigate 1) if mental health problems (depression and burnout including the dimensions; emotional exhaustion, mental distance and cognitive and emotional impairment) differed between nurses and physicians in Sweden, 2) if any differences were explained by differences in sex compositions, and 3) if any sex differences were larger within either of the two professions.
Method: Data were derived from a representative sample of nurses (n = 2903) and physicians (n = 2712) in 2022. Two scales were used to assess burnout (KEDS and BAT) and one to assess depression (SCL-6). The BAT scale has four sub-dimensions. Descriptive statistics and logistic regression were used to analyse each scale and dimension separately.
Results: Results showed that 16–28 % of nurses and physicians reported moderate to severe symptoms of burnout. The prevalence differed between occupations across the scales and dimensions used. Nurses reported higher scores on KEDS while physicians reported higher scores on BAT including the four dimensions. Also, 7 % of nurses' and 6 % of physicians' scores were above the cut-off for major depression. The inclusion of sex in the models changed the odds ratios of differences between doctors and nurses in all mental health dimensions except mental distance and cognitive impairment.
Limitations: This study was based on cross-sectional survey data which has some limitations.
Conclusion: Our study suggests that the prevalence of mental health problems is prominent among nurses and physicians in Sweden. Sex plays an important role in the difference in the prevalence of mental health problems between the two professions.

1. Introduction

Mental health problems among healthcare professionals received considerable attention during the COVID-19 pandemic (Ghahramani et al., 2021; Leo et al., 2021). However, high and increasing levels of mental health problems and sickness absence among healthcare professionals were widely reported long before the pandemic (Aagestad et al., 2016; Gómez-Urquiza et al., 2017; Khatatbeh et al., 2022; Nyberg et al., 2022; Rotenstein et al., 2018; Stengård et al., 2020; Wieclaw et al., 2006; Woo et al., 2020). Mental ill-health affects not only healthcare professionals themselves but is also associated with reduced quality and safety of healthcare (Hall et al., 2016; Salyers et al., 2017). Although

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burnout and depression are two commonly studied mental health problems among healthcare professionals in both Sweden and globally (Ghahramani et al., 2021; Hadžibajramović et al., 2022; Khatatbeh et al., 2022; Peterson et al., 2008; Rotenstein et al., 2018; Stengård et al., 2020; Wright et al., 2022) they come with numerous limitations.

First, previous studies have often used the definition of burnout by Maslach et al. (2001); it posits that burnout is a prolonged response to chronic emotional and interpersonal stressors on the job. Burnout is most commonly afflicting highly motivated employees in high-contact occupations, such as among nurses and physicians (Maslach et al., 2001). Although the use of the term "burnout" has been debated, three core dimensions of symptoms are agreed upon: emotional exhaustion, depersonalisation and reduced professional accomplishment (Maslach et al., 2001). Following the definition of Maslach, studies use the Maslach Burnout Inventory (MBI) scale with no overall measure of burnout which may have a great impact on reported prevalence (Brenninkmeijer and VanYperen, 2003; Rotenstein et al., 2018; Templeton et al., 2019). Nor do MBI have clinical cut-off values (Rotenstein et al., 2018). It has also been criticised for its lack of empirical and theoretical foundation (Schaufeli and Taris, 2005). As concluded by Ghahramani et al. (2021) in their review, studies are needed that use a uniform diagnostic tool for the assessment of burnout. Schaufeli et al., (Schaufeli et al., 2020b; Schaufeli and Taris, 2005) have developed an instrument that measures burnout, the Burnout Assessment Tool (BAT) from rigor empirical and theoretical review (Schaufeli and Taris, 2005), which we assess in this study.

Depression is defined in accordance with the international standard classification systems, the International Classification of Diseases (ICD) 10 and the Diagnostic and Statistical Manual of Mental Disorders (DSM) IV, which present lists of symptoms, all of which are not necessary for a diagnosis (Guze, 1992). Research has identified an overlap between depression and burnout (Koutsimani et al., 2019), but although the two concepts share some characteristics, they are not the same (Koutsimani et al., 2019). A recent study showed that nurses reported a higher prevalence of depressive symptoms compared to physicians (Morawa et al., 2021). However, when adjusted for numerous variables including sex, no significant differences between nurses and physicians existed.

Another limitation found in previous studies is the lack of a nationally representative sample of nurses and physicians. Nurses and physicians carry out different job tasks and have different levels of autonomy and responsibility and can therefore be exposed to partially different stressors at work, potentially yielding variations in the dimensions of burnout (Vincent et al., 2019). For instance, one study showed that while more nurses reported emotional exhaustion, more physicians reported depersonalisation (Vincent et al., 2019), indicating that the different dimensions of burnout should be explored further across professions in healthcare. Nevertheless, previous studies often include each healthcare profession, specific groups within a profession i.e., midwives (Gómez-Urquiza et al., 2017; Hadžibajramović et al., 2022; Hildingsson et al., 2013), or specific clinics (Wozniak et al., 2021; Wright et al., 2022). In studies where all healthcare workers are included, there exists little description of which professions (De Hert, 2020; Ghahramani et al., 2021; Leo et al., 2021; Peterson et al., 2008). Thus, the between professions variations are neglected.

Also, a limitation in previous studies is the neglection of different sex compositions between the professions and the impact that may or may not have on the prevalence of mental health problems (Bryngelson et al., 2011; Lidwall, 2021; Purvanova and Muros, 2010; Social Insurance Agency, 2020). This may be especially important in Sweden where female labour market participation is high, the existence of a gender segregated labour market and where about half of all practising physicians are women. For example, Vincent et al. (2019) reported that across intensive care unit staff, differences in the prevalence of mental health problems existed between professions and between sexes separately, i.e., not adjusting for variations in sex composition. Also, sex differences concerning mental health problems have been reported within the same healthcare profession (Cañadas-De la Fuente et al., 2018; Hagqvist et al., 2022). However, these studies did not explore how the variation in sex composition in different groups of healthcare professionals influenced the prevalence of burnout and depression. Meanwhile, a meta-analysis did not find any gender differences in burnout but that small differences exist in the different symptoms of burnout. Variations in mental health problems in healthcare are thus not fully understood, emphasising the need for research that accounts for sex compositions in healthcare professionals.

Addressing important knowledge gaps, the aim of the present study was to investigate mental health problems in a nationally representative sample of registered nurses and physicians working in Sweden. Specifically, the aim was to investigate mental health problems, i.e., depression, burnout, and the burnout dimensions of emotional exhaustion, mental distance, cognitive impairment, and emotional impairment among nurses and physicians in Sweden. Our hypotheses are:

H1). Nurses have a higher prevalence of mental health problems than physicians.

H2). The differences in the prevalence of mental health problems between nurses and physicians are explained by differences in sex compositions between the two professions.

H3). Female nurses and physicians respectively have a higher prevalence of mental health problems than their male counterparts.

2. Method

2.1. Sample and data collection

Data were drawn from the Longitudinal Occupational Health survey in HealthCare Sweden (LOHHCS) study 2022. The LOHHCS data was collected from a representative sample of all practising nurses (registered nurses and midwives) and physicians working in the Swedish health and social care sector from February to May 2022. Using stratified random sampling, a total of 7908 physicians and 7790 nurses were drawn from the Swedish Occupational register. Those sampled received postal invitations from Statistics Sweden to participate in the study. The invitation included personal log-in information for a web-based survey. Three reminders were sent by mail. A paper version of the questionnaire was included in a fourth reminder sent by post. The response rate was 34.3 % (n = 2712) for physicians and 37.3 % (n = 2903) for nurses. Statistics Sweden calculated calibrating weights to adjust for missing data, sampling errors and stratification, which are applied in this study.

In this study, we restricted the sample to those 67 years old or younger. With weights applied, this amounts to 138,952 individuals, of which 73.3 % were nurses and 26.7 % were physicians (Table 2).

The Swedish Ethical Review Authority approved this study (2020-06613; 2021-05574-02; 2022-00310-02).

2.2. Measurements

Self-perceived *burnout* was measured using two scales: Burnout Assessment Tool 12 (BAT-12) for those currently in work (Hadžibajramović et al., 2020; Schaufeli et al., 2020b) and the Karolinska Exhaustion Disorder Scale (KEDS) (Besèr et al., 2014).

The BAT-12 comprises 12 items divided into four dimensions. Each dimension represents symptoms of burnout, i.e., emotional exhaustion (3 items), mental distance (3 items), emotional impairment (3 items), and cognitive impairment (3 items). Each item has a five-point answer scale ranging from never to always. In this study, we computed a grand mean score for the BAT-12 as well as for each dimension as carried out by Schaufeli et al. (2020a). Based on the traffic light model (Schaufeli et al., 2020a), clinical cut-off scores for the overall BAT-12 and for each of the four dimensions were applied, where scores in the green zone mean "no burnout", orange zone scores indicate "at risk for burnout", and

Table 1
Cronbach's alpha and traffic light cut-off values for KEDS, BAT-12, Exhaustion, Mental distance, Emotional impairment, Cognitive impairment and SCL-CD6.

	Cronbach Alpha	Orange	Red
KEDS	0.911	≥19	≥30
BAT-12	0.837	≥3.17	≥3.50
Exhaustion	0.864	≥3.17	≥3.17
Mental distance	0.790	≥2.17	≥2.83
Emotional impairment	0.845	≥2.17	≥3.17
Cognitive impairment	0.815	≥2.83	≥2.96
SCL-CD6	0.913		≥17

scores in the red zone indicate "likely to be burned out". Cronbach Alpha as well as cut-off values for orange and red for BAT-12 and the four dimensions are listed in Table 1.

The KEDS comprises nine items based on symptoms. Each KEDS item has seven unipolar response alternatives ranging from 0 to 6, with higher values indicating more severe symptoms. The overall KEDS score is calculated by summating the nine items to an index ranging from 0 to 54. Besér et al. (2014) have calculated a cut-off at 19 points. In this study, a score between 19 and 29 was considered milder symptoms (orange), and scores from 30 to 54 indicated severe burnout (red) (Table 1).

Self-rated *depression* was measured using the Symptom Check List – Core depression 6 (SCL-CD6) (Magnusson Hanson et al., 2014). Respondents were asked about the prevalence of six different symptoms of depression with answers on a five-point scale, where a higher score indicates more symptoms. The symptoms were feeling blue or sad, having no interest in things, being low in energy, saying everything is an effort, worrying too much, and blaming oneself. Symptoms were summarised, and similarly to Magnusson Hanson et al. (2014), the cut-off was set at 17. Individuals with scores of ≥17 most probably have major depression (Magnusson Hanson et al., 2014). See Table 1 for Cronbach Alpha for SCL-CD6.

Sex was added to LOHHCS data by Statistics Sweden as derived from the national population register held by Statistics Sweden (Hagqvist et al., 2022). All analyses were adjusted for by number of working hours, years of experience and age.

2.3. Analytical strategy

Cronbach's Alphas for each of the outcome variables were first calculated. The distribution of each outcome variable between male and female nurses and physicians was then computed.

Next, logistic regression analyses were performed to estimate differences in each outcome between physicians and nurses, with nurses being the reference category. The red zone for BAT-12, the four dimensions, and KEDS was set as the outcome, while green and orange was set as the reference category. For SCL-DC6, we applied the cut-off value for major depression as described above.

Three models were run for each outcome. Model 1 included professions (nurse or physician) (addressing aim 1). In Model 2, sex was included (addressing aim 2). In Model 3, we included an interaction term between professions and sex (addressing aim 3). Interaction on the multiplicative scale was estimated. The analyses were adjusted for sex, age and age-squared (to allow for a positive but decrementing role of age, as has been reported earlier) (Mastekaasa, 2005). The results are presented with odds ratios (OR) and 95 % Confidence Intervals (CI).

To further explore the importance of sex among nurses and physicians, stratified logistic regression analyses were performed based on profession and sex, respectively.

3. Results

3.1. Descriptive statistics

Cronbach's alpha and traffic light cut-off values for overall KEDS and BAT-12 scores, and for the burnout dimensions of emotional exhaustion, mental distance, emotional impairment, and cognitive impairment are presented in Table 1.

Table 2 demonstrates the occupational characteristics of nurses and physicians, respectively. While the nursing profession was female-dominated (88.6 % of the nurses were women), the sex distribution among physicians was almost equal (52.9 % of the physicians were women). As many as 28 % of the healthcare professionals scored red or orange on the KEDS scale, and 15.6 % scored red or orange on the BAT-12 scale. Between 6 and 7.5 % were in the red zone for the BAT-12 and KEDS scales, respectively, indicating that they had severe burnout. While nurses tended to report higher scores on the KEDS scale, physicians reported higher on the BAT-12 scale.

Focusing on the four dimensions of burnout measured with the BAT-12 scale, Table 2 shows a high prevalence of emotional exhaustion among both nurses and physicians, with 14.3 % in the red zone. A large proportion of nurses and physicians were in the orange zone of mental distance and emotional impairment, with a slightly larger share of physicians. However, only a small proportion of nurses and physicians reported symptoms of cognitive impairment.

Based on the SCL-CD6, a slightly higher proportion of nurses (6.7 %) than physicians (5.9 %) reported symptoms of likely major depression.

Table 2
Distribution of study variables among male and female nurses and physicians in the Longitudinal Occupational Health survey in HealthCare Sweden 2022.

	Total	Nurses			Physicians		
		All	Female	Male	All	Female	Male
Total (n)[a]	138,952	101,809	90,212	11,598	37,143	19,634	17,509
Total		73.3 %	88.6 %	11.4 %	26.7 %	52.9 %	47.1 %
BAT Orange	9.5 %	9.6 %	10.0 %	6.4 %	9.2 %	10.0 %	8.2 %
BAT Red	6.1 %	5.8 %	6.0 %	4.2 %	6.9 %	8.6 %	5.0 %
Exhaustion Orange	7.4 %	7.7 %	7.7 %	7.6 %	6.7 %	8.4 %	4.8 %
Exhaustion Red	14.3 %	14.2 %	15.1 %	8.0 %	14.3 %	15.8 %	12.7 %
Mental distance Orange	22.9 %	22.2 %	22.2 %	21.9 %	24.9 %	25.1 %	24.6 %
Mental distance Red	7.4 %	6.5 %	6.5 %	6.1 %	10.1 %	10.5 %	9.7 %
Emotional impairment orange	18.3 %	18.3 %	18.7 %	14.8 %	18.5 %	20.2 %	16.5 %
Emotional impairment Red	7.4 %	7.2 %	7.1 %	7.3 %	8.2 %	10.0 %	6.2 %
Cognitive impairment Orange	3.0 %	3.2 %	3.5 %	0.9 %	2.5 %	3.4 %	1.4 %
Cognitive impairment Red	1.4 %	1.5 %	1.5 %	1.1 %	1.1 %	1.4 %	0.8 %
KEDS Orange	20.6 %	22.6 %	23.4 %	15.9 %	15.7 %	18.1 %	12.7 %
KEDS Red	7.4 %	8.1 %	8.6 %	4.5 %	5.1 %	7.5 %	2.7 %
Depression	6.5 %	6.7 %	7.0 %	4.7 %	5.9 %	6.9 %	4.8 %

[a] Numbers when using calibrating weights.

Table 3a
Logistic Regression with mental self-rated health problems among male and female physicians and nurses from the Longitudinal Occupational Health survey in HealthCare Sweden 2022.

	BAT -12			Exhaustion			Mental distance			Emotional impairment			Cognitive impairment		
	M1	M2[a]	M3[a]	M1	M2[a]	M3[a]	M1	M2[a]	M3[a]	M1	M2[a]	M3[a]	M1	M2[a]	M3[a]
Nurses	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Physicians	1.18 (1.13–1.24)	1.37 (1.30–1.45)	1.30 (1.16–1.46)	0.99 (0.96–1.02)	1.15 (1.11–1.19)	1.79 (1.65–1.95)	1.60 (1.54–1.67)	1.64 (1.57–1.72)	1.80 (1.64–1.98)	1.08 (1.04–1.13)	1.18 (1.13–1.24)	0.89 (0.81–0.98)	0.72 (0.64–0.80)	0.82 (0.73–0.92)	0.83 (0.65–1.05)
Men		1	1												
Women		1.63 (1.53–1.74)	1.57 (1.43–1.73)		1.59 (1.53–1.67)	2.19 (2.05–2.35)		1.08 (1.02–1.14)	1.16 (1.07–1.26)		1.32 (1.25–1.39)	1.09 (1.01–1.18)		1.59 (1.38–1.83)	1.60 (1.33–1.92)
Physicians * women			1.07 (0.94–1.22)			0.56 (0.51–0.61)			0.88 (0.79–0.98)			1.45 (1.30–1.61)			0.99 (0.75–1.31)
Nagelkerke R	0.035	0.040	0.040	0.038	0.043	0.045	0.051	0.051	0.051	0.029	0.031	0.032	0.046	0.049	0.049

[a] Adjusted for number of working hours, years of experience and age.

3.2. Mental health problems among nurses and physicians

In Table 3a and 3b, we present the result of the logistic regression analyses for each model and outcome. In Model 1, there is an increased likelihood for physicians to report high overall BAT-12 scores (i.e., in the red zone), high scores in the burnout dimensions of mental distance, and emotional impairment when adjusted for age and age-squared. There were no statistically significant differences in the level of exhaustion between nurses and physicians. Nurses were more likely than physicians to report severe symptoms of cognitive impairment.

In Model 2, where sex was included, the ORs for physicians increased for all BAT-12 outcomes except for cognitive impairment, which indicates potential interaction. For cognitive impairment, differences between nurses and physicians decreased, but nurses were still more likely to report cognitive impairment. The results for KEDS further confirmed the results in Table 2, showing that nurses had a higher risk than physicians of reporting a red zone value (OR = 0.63, 95%CI: 0.59–0.66). In Model 2, differences between nurses and physicians decreased (OR = 0.75, 95%CI: 0.72–0.80) only to increase again in Model 3 (OR = 0.48, 95%CI: 0.37–0.63).

Lastly, nurses had a higher likelihood to report major depression (OR = 0.84, 95 % CI: 0.79–0.88), but after adjusting for sex in Model 2, the difference between nurses and physicians was no longer statistically significant.

Model 3 (Table 3a and 3b) shows the interaction term across all health measurements. The interaction term was statistically significant for all outcome measures except for BAT-12 and for cognitive impairment.

To further explore the role of sex, Table 4 shows the results stratified by professional group and sex. Starting with profession (on the left side of Table 4), results show that female physicians and nurses have a higher likelihood to report a value in the red zone across all mental health outcomes compared to male physicians and nurses (except mental distance for physicians).

On the right side of Table 4, i.e., results stratified by sex, it shows that female physicians in relation to female nurses have a higher likelihood to report values in the red zone for BAT-12, mental distance, and emotional impairment. Female nurses had a higher likelihood to report scores in the red zone for KEDS, cognitive impairment and depression, while no statistically significant difference was observed for exhaustion. Male physicians had higher statistically significant OR for BAT-12, exhaustion, and mental distance. Male nurses had a higher likelihood to report high values for KEDS and emotional impairment, while depression was not statistically significant.

4. Discussion

This cross-sectional study investigated mental health problems among nurses and physicians working in Sweden in 2022. It also investigated how sex differences within and between the professions relate to the mental health problems reported. Our results showed that 16–28 % of nurses and physicians reported moderate to severe symptoms of burnout and that 7 % of nurses and 6 % of physicians reported symptoms of likely major depression. Sex played an important role in the different prevalence's between doctors and nurses in all mental health dimensions except mental distance and cognitive impairment.

Several of our findings are consistent with the current state of knowledge about mental health problems among healthcare professionals. Our results confirm previously reported findings that a significant number of healthcare professionals have moderate or severe symptoms of mental health problems, whether it is measured during the COVID-19 pandemic or not (Ghahramani et al., 2021; Khatatbeh et al., 2022; Morawa et al., 2021; Peterson et al., 2008; Rotenstein et al., 2018; Woo et al., 2020). However, our study adds to previous knowledge by showing that there were differences in the levels of mental health problems between nurses and physicians and that different sex

Table 3b
Logistic Regression with mental self-rated health problems among male and female physicians and nurses from the Longitudinal Occupational Health survey in HealthCare Sweden 2022.

	KEDS >30			Depression		
	M1	M2[a]	M3[a]	M1	M2[a]	M3[a]
Nurses	1	1	1	1	1	1
Physicians	0.60 (0.57–0.63)	0.76 (0.72–0.80)	0.62 (0.54–0.70)	0.84 (0.79–0.88)	0.95 (0.90–1.00)	1.08 (0.96–1.21)
Men		1	1		1	1
Women		2.38 (2.18–2.55)	2.13 (1.94–2.34)		1.53 (1.44–1.63)	1.66 (1.52–1.82)
Physicians * women			1.28 (1.11–1.47)			0.84 (0.74–0.96)
Nagelkerke R	0.019	0.031	0.032	0.033	0.037	0.037

[a] Adjusted for number of working hours, years of experience and age.

Table 4
Logistic Regression with mental self-rated health problems stratified by professions and sex adjusted for number of working hours, years of experience and age.

	Stratified by professions				Stratified by sex			
	Female physicians	R[a]	Female nurses	R[a]	Female physicians	R[a]	Male physicians	R[a]
KEDS	2.74 (2.46–3.05)	0.044	2.13 (1.95–2.34)	0.023	0.79 (0.74–0.83)	0.018	0.60 (0.53–0.68)	0.009
BAT-12	1.73 (1.59–1.89)	0.017	1.60 (1.45–1.76)	0.055	1.38 (1.30–1.47)	0.041	1.28 (1.14–1.44)	0.022
Exhaustion	1.26 (1.19–1.34)	0.008	2.23 (2.08–2.39)	0.065	1.00 (0.96–1.05)	0.042	1.78 (1.64–1.93)	0.037
Mental distance	1.03 (0.96–1.11)	0.018	1.16 (1.07–1.26)	0.058	1.60 (1.52–1.69)	0.053	1.80 (1.64–1.98)	0.045
Emotional impairment	1.62 (1.50–1.75)	0.019	1.11 (1.03–1.20)	0.039	1.29 (1.22–1.36)	0.034	0.89 (0.81–0.98)	0.021
Cognitive impairment	1.67 (1.36–2.05)	0.010	1.63 (1.35–1.96)	0.067	0.82 (0.71–0.93)	0.052	0.81 (0.63–1.03)	0.017
Depression	1.44 (1.32–1.58)	0.012	1.68 (1.54–1.84)	0.048	0.90 (0.85–0.96)	0.038	1.05 (0.94–1.18)	0.019

[a] Nagelkerke R.

compositions could explain some of the differences in mental health problems between the two professions. Furthermore, the results show that sex differences in health outcomes were larger among physicians concerning some outcomes (emotional impairment) and larger among nurses in others (depression, exhaustion, mental distance), which is consistent with previous findings by Vincent et al. (2019).

Our study shows that sex plays an important role in the prevalence of mental health issues in nurses and physicians. One reason for this can be that nursing is a predominantly female occupation and has been for many years. Poor occupational health in female-dominated occupations is well-recognised in research (Lidwall, 2021; Mastekaasa, 2005). Medicine, on the other hand, has traditionally been practised by men and is still attributed to masculine norms (Selberg, 2012). However, there are changes occurring and today there is a more even sex distribution among physicians which can lead to higher pressure on female physicians compared to their male colleagues (Langballe et al., 2011). The mechanisms that cause variations in the prevalence of mental health problems between nurses and physicians warrant further attention. Also, the occupational stressors experienced by female physicians compared to their male partners also need further research.

The prevalence of burnout and depression documented in our study is higher compared to what has previously been reported for occupational groups outside of healthcare using the same measurement as we have (De Beer et al., 2020; Magnusson Hanson et al., 2014). The fact that the assessment of burnout or symptoms of burnout and depression differ between studies makes the results difficult to compare. For instance, in the review by Rotenstein et al. (2018), the prevalence of overall burnout ranged from 0 to 80 %. Although, we used both KEDS and BAT-12 which are overall measurements of burnout and have clinical cut-off values to identify individuals at risk of burnout or currently burned out (clinical burnout), the prevalence measured with the two scales differs for nurses and physicians in Sweden. Similarly, a recent meta-analysis identified statistically significant differences between different scales to measure burnout (Koutsimani et al., 2019). One reason for this can be that BAT-12 is a composite of four dimensions, whereas KEDS has only one dimension (Besèr et al., 2014; Hadžibajramović et al., 2020; Schaufeli et al., 2020b, 2020a). Another reason can be that they capture different stages of burnout. Future studies should further explore the variations across scales and identify mechanisms that might contribute to these differences.

The data collection occurred during the spring of 2021 when healthcare was under enormous pressure from the COVID-19 pandemic. For physicians, compared to data from 2021, our study indicates that the prevalence of mental health problems has increased over the last year (Hagqvist et al., 2022). This is in line with Shanafelt et al. (2022), who reported that the prevalence of burnout among American physicians increased during the 12-month interval between the end of 2020 and the end of 2021. We do not have any data for nurses in Sweden from 2021, but given that nurses have been exposed to the same extreme working conditions as physicians over the last year due to the COVID-19 pandemic (Eftekhar Ardebili et al., 2021; Harris et al., 2021), there are reasons to believe that the prevalence of mental health problems has increased among them as well. As both nurses and physicians have been exposed to work stressors following the pandemic to a similar extent, we do not expect that the pandemic have impacted our results.

All in all, our three hypotheses were only partially confirmed mainly due to heterogeneity across scales. This gives reasons to further explore mental health problems between nurses and physicians and what workplace factor impact their health.

4.1. Implications and future perspectives

The high rates of mental health problems identified among nurses and physicians working in Sweden are serious and need urgent attention at many levels, from employers to healthcare policy- and decision-makers. Mental health problems, including burnout and depression, are complex and due to many different causes. Regarding the role of the psychosocial work environment, current research identifies the need for organisation-oriented interventions to improve the health and well-being of healthcare professionals (De Lange et al., 2020; Dellve et al., 2016; Lebares et al., 2021; Løvseth and de Lange, 2020; Nielsen et al., 2018). Until now, efforts (in both research intervention and by employers) have mainly focused on promoting the individuals' mental ability to handle stress and demanding work, rather than focusing on system factors that cause burnout, such as work demands, social support and leadership (Dellve and Eriksson, 2017; Shanafelt et al., 2012; Shanafelt and Noseworthy, 2017).

4.2. Strengths and limitations

This study was based on cross-sectional survey data, which does not allow causal inferences. However, a major strength of this study is the high quality of the survey data, being based on survey data from a large representative sample of nurses and physicians working in health facilities across all of Sweden. The analysis applied weights to compensate for sampling errors and missing data, thus strengthening the representativeness of the sample and allowing for conclusions about the health status of the whole population of Swedish nurses and physicians. Another strength is the use of well-established and validated tools, such as the BAT, the KEDS, and the SCL-CD6, to measure mental health problems in the examined populations. To the best of our knowledge, there are few other studies that have access to such high-quality data.

5. Conclusion

In conclusion, our study suggests that sex plays an important role in the prevalence of mental health problems among nurses and physicians in Sweden. This is, to the best of our knowledge, the first paper that explores the role of sex in variations in mental health problems for physicians and nurses. The mechanisms behind these differences need further attention in research. Furthermore, our study shows that the prevalence of mental health problems is high among physicians and nurses. This can have detrimental effects on patient safety and care delivery and sudden measures are needed to reduce symptoms of burnout and depression.

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Nothing to report.

CRediT authorship contribution statement

Emma Brulin: Conceptualization, Methodology, Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Visualization, Project administration, Funding acquisition. **Ulrik Lidwall:** Conceptualization, Writing – review & editing. **Ida Seing:** Writing – original draft, Writing – review & editing, Visualization. **Anna Nyberg:** Conceptualization, Writing – original draft, Writing – review & editing, Visualization. **Bodil Landstad:** Conceptualization, Investigation, Writing – review & editing. **Malin Sjöström:** Conceptualization, Writing – original draft, Writing – review & editing. **Fredrik Bååthe:** Writing – review & editing. **Per Nilsen:** Conceptualization, Writing – original draft, Writing – review & editing.

Declaration of competing interest

Authors have no conflicting interest to report.

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