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Research Article

Measuring moral distress in Swedish intensive care: Psychometric and descriptive results

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ABSTRACT

Objectives: To investigate the construct validity and psychometric properties of the Swedish version of the Moral Distress Scale–Revised and to describe moral distress in an intensive care context.
Research Methodology/Design: The Italian Moral Distress Scale–Revised was translated and semantically adjusted to the Swedish intensive care context. A web survey with 14 moral distress items, as well as three additional and eight background questions was answered by critical care nurses (N = 71) working in intensive care units during the second year of the coronavirus disease pandemic. Inferential and descriptive statistics were used to investigate the Italian four-factor model and to examine critical care nurses' moral distress.
Results: The result shows a factor model of four components differing from the previous model. Critical care nurses demonstrated significant differences in moral distress regarding priorities compared to before the pandemic, type of household; experience as critical care nurses and whether they had supervised students during the pandemic.
Conclusion: The component structure might have originated from the specific situation critical care nurses perceived during the pandemic. The health care organisations' role in preventing and healing the effects of moral distress is important for managers to understand.
Implications for clinical practice: Moral distress is common in intensive care and it is necessary to use valid instrument when measuring it. A psychometrical investigation of the Swedish version of the Moral Distress Scale–Revised, adapted for intensive care shows need for further semantic and cultural adaptation. Perceived priorities during the pandemic, household type, supervising during the pandemic and working experience were related to critical care nurses' experience of moral distress and managers need to be aware of conditions that may trigger such a response.

Introduction

Critical care nurses (CCNs) working in intensive care units (ICUs) are engaging with some of the most challenging ethical issues of our time (Gallagher, 2020). Providing nursing care for critically ill patients suffering from COVID-19 is somewhat like the nursing care for patients who experienced suffering from A(H1N1) flu, such as respiratory failure and need for mechanical ventilation (Domínguez-Cherit et al., 2009). On the one hand, there are similarities with the A(H1N1) swine flu pandemic in 2009 but there are also key differences for example the high number of critically ill patients with increased workload for CCNs (Fernández-Castillo et al., 2021; Lucchini et al., 2020) and patients' complications such as acute respiratory failure, sepsis, acute renal insufficiency and thromboembolic conditions (Clerkin et al., (2020).

The challenges of working with new co-workers (Andersson et al., 2021; Cadge et al., 2021), limited resources (Andersson et al., 2021; Lai et al., 2020) and routine and impersonal nursing care (Andersson et al., 2021) might increase moral distress, which was already common among

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CCNs (Allen & Butler, 2016; Fumis et al., 2017) before the complexities imposed by the COVID-19 pandemic. Moral distress resulting from actions – or the lack thereof – has been highlighted as a particular risk among CCNs and other healthcare staff during the COVID-19 pandemic (Greenberg et al., 2020). Being under pressure to compromise on patient safety or the quality of care due to a lack of time, resources or understaffing or during end-of-life care can trigger moral distress (de Boer et al., 2015; Kok et al., 2021; Romero-García et al., 2022). Knock-on effects include a negative impact on nurses' moral integrity, an increase in the risk of professional burnout, a reduction in job satisfaction, the awakening of intentions to resign and an inability to deliver the desired care with quality (Asgari et al., 2019; Colville et al., 2018; Henrich et al., 2017; McCarthy & Gastmans, 2015). Previous studies showed that CCNs' experiences of moral distress are negatively correlated with collaboration (Papathanassoglou et al., 2012), hospital ethical climate (Silén et al., 2011), empowerment (Ganz et al., 2013) and work engagement (Lawrence, 2011).

According to Jameton, moral distress might arise when a person "knows the right thing to do, but institutional constraints make it nearly impossible to pursue the right course of action" Jameton, 1984, p.6). The definition by Jameton (1984) describes moral distress in psychological, emotional, and physiological terms. However current nursing research emphasises that moral distress might be handled in acting with others (Jameton, 2017), and Morley et al. (2020) suggested that Jameton's definition of moral distress need to be further specified into a variety of moral events.

Regardless of definition, moral distress is linked to the presence of constraint on nurses' moral agency and can intensify over time (McCarthy & Gastmans, 2015). Most previous studies investigating moral distress among health care professionals used instruments based on Corley's operationalisation of Jameton's theory (Giannetta et al., 2020). Corley et al. (2001) developed the Moral Distress Scale (MDS) to measure CCNs' experience of moral distress. The original version of MDS included 32 items rated on a five-point Likert scale and distributed on three factors, with a Cronbach's alpha ranging from 0.82 to 0.97. Hamric & Blackhall (2007) developed a revised version of the scale (MDS-R), which included two aspects of moral distress – frequency and intensity– and had fewer items. Hamric et al. (2012) then made the MDS-R applicable to different healthcare professionals and to acute care clinical settings. The MDS-R has been used in numerous studies and has been shown to have good reliability measured as Cronbach's alpha coefficients and validity examined using exploratory and confirmatory factor analyses (Giannetta et al., 2020). Since then, the MDS and MDS-R have been further developed and tested in several different contexts, resulting in different solutions (Giannetta et al., 2020). Moral distress in Swedish health care has been examined previously, mostly in general wards. Sandeberg et al. (2017) translated and adapted the MDS-R to fit into paediatric cancer care and Fischer-Grönlund & Brännström (2021) conducted a translation and cultural adaptation of the Measure of Moral Distress for Healthcare Professionals (MMD-HP). Further, Silén et al. (2011) examined instrument usability of the MDS at two Swedish hospitals in which several items about moral distress in intensive care were considered irrelevant.

Moral distress in a European ICU context was studied by Lamiani et al. (2017) who explored the factorial structure of the MDS-R. The Italian MDS-R was composed of 14 items and referred to four factors: futile care, poor teamwork, deceptive communication, and ethical misconduct. The internal consistency of the instrument was good with a Cronbach's alpha at 0.81. The model accounted for 59 % of the total variance and presented a good fit with the data (Lamiani et al. 2017).

The COVID-19 pandemic brought exceptional challenges for healthcare community with ICUs forced to increase capacity by rapidly scaling up number of beds, introduce and integrate additional staff, all in the setting with limited resources to creating physical and clinical capacity for care of highly contagious patients (Halpern et al., 2020). Lake et al. (2022) found in their study, in North Eastern United States during the first COVID-19 surge, that nurses' moral distress was correlated with the number of infected patients, access to personal protective equipment and supplies as well as leadership communication. Measuring moral distress is important because it might affect care quality, CCNs and ICU management systems. Until recently, the MDS-R had not been used to measure moral distress among CCNs in a Swedish context (Giannetta et al., 2020) and because the instrument seemed to be relevant for the Swedish intensive care context, the Lamiani et al. (2017) questionnaire was translated into Swedish. When a questionnaire is translated into another language and is to be used in another culture, measurement equivalence is required (Polit & Yang, 2016). Therefore, the aim of this study was to investigate the construct validity and psychometric properties of the Swedish version of the Moral Distress Scale–Revised and to describe moral distress in an intensive care context.

Methods

Design

The study employs a cross-sectional design with psychometric, descriptive and comparative aims where digital data was collected using a questionnaire. The study was also used to describe critical care nurses' perceptions of moral distress during the second year of COVID-19 pandemic (Andersson et al., 2022).

Setting and sample

Participants were frontline CCNs working in ICUs during the second year of the COVID-19 pandemic meeting the following inclusion criteria: employed as registered nurses with a post-graduate education at an advanced level (Marshall et al. 2017) in intensive care nursing. A total of 135 responded to the questionnaire and 71 of those met the inclusion criteria, thus making up the sample.

Ethical consideration

The study participants received written information in an introductory text in the survey about the studýs aim, voluntary participation and that participant identity would be anonymous. The information also stated that digital submission of the online questionnaires was considered to constitute consent. This procedure correspond to the World Medical Association's ethical principle (2020). However, the study did not handle sensitive data and patient data, which falls under the scope of the Ethical Review Act and thus a full application and ethical review was not required (2003:406).

Data collection

A digital (Survey&Report) questionnaire of the Swedish version of the MDS-R with an information letter about the study was distributed through three webpages intended for CCNs on the social media platform Facebook between May and June 2021. Information about the study and a link to the survey were placed on the Facebook pages of the Intensive Care Nurses (633 followers), the Swedish Association for Anesthesia and Critical Care nurses (1900 followers) and the Registered Nurses (34,300 followers). Two digital reminders were posted for each group. Completed questionnaires were digitally returned anonymously by participating CCNs simply by clicking "Finish". All responses were anonymous, thus CCNs could not withdraw from the study after submitting their data. The used software was constructed in such a way so the IP-address logged the questionnaire to the specific device, which means that the same device could not answer the questionnaire more than once.

The questionnaire

We used the Italian MDS-R, originally developed and tested for nurses solely by Corley et al. (2001), later revised (MDS-R) by Hamric et al. (2012) and used by nurses and physicians. Permission to translate the Italian version of the MDS-R questionnaire into Swedish and to use it in a Swedish critical care context was given by Giulia Lamiani. The MDS-R consists of 14 items divided into four dimensions: futile care (three items), ethical misconduct (five items), deceptive communication (three items) and poor teamwork (three items). Participants assessed their perceived moral distress by giving responses on a 5-point Likert scale ranging from 0 (never) to 4 (very frequently) for the frequency scale and from 0 (none) to 4 (to a great extent) for the intensity scale. For each item, a composite score is calculated by multiplying the frequency and the intensity scores. The total dimensional score is obtained by summing up the frequency X intensity score. The total score for each item ranges from 0 to 16 (Lamiani et al, 2017). An additional question, developed for the Swedish version of the MDS-R, asked if CCNs had made changes in the priorities of nursing measures during the pandemic compared to before (the pandemic). The additional question was answered dichotomously. The demographic section included gender, age, type of household, post-graduate education within intensive care, length of experience working within critical care and the respondents experience of supervising students during the pandemic (Table 1).

Translation procedures

Brislin's (1970) model inspired the translation of the MDS-R into Swedish. A bilingual translator whose native language was Italian and who had substantial experience of Swedish healthcare conducted the forward translation of the Italian version of MDS-R into Swedish. The research group reviewed the translated version in parallel with the English version which resulted in some semantic and conceptual adjustments. Back-translation of the reviewed Swedish version into Italian was performed by the translator and all members of the research group and discussed for consensus. To establish semantic equivalence, the translated version was reviewed among four CCNs. On each item, the participant had the opportunity to comment on the language and if the item was understandable and clear. The review of the participants' responses in the Swedish ICU context led to some changes to clarify the language and the concepts in the questionnaire.

Table 1
Respondent demographics (n = 71).

Characteristic	n	%
Age		
≤ 25 years	1	1
26– 35 years	18	26
36– 45 years	25	35
46– 55 years	19	27
≥ 56 years	8	11
Sex		
Female	58	82
Male	11	15
Wish not to specify	2	2
Household		
Single with children	11	16
Single without children	13	18
Cohabiting with children	37	52
Cohabiting without children	10	14
Education, advanced level		
Post-graduate within intensive care	71	100
ICU experience		
≤5 years	22	31
6–10 years	16	22
11–15 years	14	20
≥ 16 years	19	27
Supervising during pandemic		
Yes	37	52
No	33	46

Data analysis

Data from the participants (n = 71) were first investigated for inter-item correlations using Pearson's r. Descriptive statistics were used to investigate mean, median, range, and standard deviation for the moral distress items. Construct validity – in this case, the previously hypothesised four factors of the Italian MDS-R model developed by Lamiani et al. (2017) – was examined by principal component analysis (PCA) using a covariance matrix. Differences in experience of moral distress measured using the Swedish version of the MDS-R was calculated using analysis of variance (ANOVA) ($p < 0.05$). Significant F-levels were followed by post hoc comparison (Tukey, 1949) to analyse differences between groups. Statistical analysis was conducted using IBM Statistical Package for Social Sciences (SPSS), version 27.

Results

From a sample of 71 CCNs (Table 1- demographics), data from 70 CCNs held information that was specific to the analyses.

Table 2 presents the items and describes mean and standard deviation for the 14 items in the questionnaire. Items 6, 8, and 12 demonstrated the highest moral distress mean values, while items 4, 9, 10, and 14 demonstrated the lowest moral distress values.

Due to low correlations (lowest 0.019 and highest 0.668), a confirmatory factor analysis (CFA) would not provide a solution (Field, 2005; Tabachnick & Fidell, 2012) and thus a construct analysis was performed using principal component analysis with Promax rotation. The principal component solution showed a factor model of four components (Table 3-Pattern Matrix), that in its structure deviates from the structure in the survey by Lamiani et al. (2017). Four items followed the Lamiani et al.,

Table 2
Items and descriptors for the moral distress items in the Swedish version of MDS-R.

Item	N	Mean	(STD)
1 Witness healthcare providers giving 'false hope' to the patient or family	69	4.17	(3.869)
2 Follow the family's wishes to continue life support, even though I believe it is not in the best interest of the patient	69	5.45	(4.347)
3 Initiate extensive life-saving actions when I think they will only prolong death	69	6.39	(4.460)
4 Follow the family's request not to discuss death with a dying patient when they ask about dying	70	1.29	(2.317)
5 Feel pressure from others to order what I consider to be unnecessary tests and treatments	70	3.69	(3.224)
6 Continue to participate in the care of a hopelessly ill person who is being sustained on a ventilator when no one will make the decision to withdraw support	70	7.26	(4.608)
7 Avoid taking action when I learn that a physician or nursing colleague made a medical error and did not report it	70	2.51	(2.501)
8 Assist another physician or nurse who, in my opinion, is incompetent	70	6.80	(4.883)
9 Increase the dose of sedatives/opiates for an unconscious patient when I believe doing so could hasten the patient's death	70	1.54	(2.806)
10 Take no action on an observed ethical issue because the involved staff member or someone in a position of authority requested that I do nothing	70	0.84	(2.012)
11 Follow the family's wishes for the patient's care when I do not agree with them because of the fear of being reported	70	1.56	(3.082)
12 Watch patient-care quality suffer because of a lack of provider continuity	70	7.50	(5.024)
13 Witness diminished patient-care quality due to poor team communication	70	6.29	(4.632)
14 Ignore situations in which patients were not given adequate information to ensure informed consent	69	1.54	(1.820)

Table 3
Pattern Matrix with correlations for the Principal Component Analysis of the 14 moral distress items in the Swedish version of MDS-R.

	Raw				Rescaled			
Factor	1	2	3	4	1	2	3	4
Item								
1	3.078				0.857			
2			4.113				0.933	
3	4.156				0.932			
4	0.711				0.363			
5	1.557				0.480			
6	2.970				0.649			
7								
8				4.896				0.990
9		1.036	−1.237			0.364	−0.435	
10								
11			1.794				0.580	
12		4.820				0.950		
13		4.067				0.899		
14				0.642				0.366

Extraction method: Principal component analysis. Rotation method: Promax with Kaiser normalization. Rotation converged in 6 iterations.

(2017) structure. Item 3: "*Initiate extensive life-saving actions when I think they will only prolong death*" and item 6: "*Continue to participate in the care of a hopelessly ill person who is being sustained on a ventilator when no one will make the decision to withdraw support*" was found in the Factor "Futile care". Item 8: "*Assist another physician or nurse who, in my opinion, is incompetent*" was found in the Factor "Poor teamwork" and Item 9: "*Increase the dose of sedatives/opiates for an unconscious patient when I believe doing so could hasten the patient's death*" was found in the Factor "Ethical misconduct". Table 3 shows correlations for the 14 moral distress items in the factor structure. In Table 4, correlation coefficients for the 14 moral distress items are shown.

CCNs experience of moral distress differed significantly between CCNs who indicated no changes in priorities (n = 10) and those who indicated changes in priorities compared to before the pandemic (n = 60) for three single MDS-R items. The results show that CCNs assessed increased moral distress for the items "*Continue to participate in the care of a hopelessly ill person who is being sustained on a ventilator when no one will make the decision to withdraw support*" ($p = 0.027$), "*Assist another physician or nurse who, in my opinion, is incompetent*" ($p = 0.029$) and "*Witness diminished patient-care quality due to poor team communication*" ($p = 0.027$) (Table 5- Means and differences of moral distress).

Further examination of moral distress measured with single Swedish MDS-R items showed significant differences between CCNs of different household types (Table 6). The result showed that CCNs who were cohabitant without children (n = 10) experienced significantly higher moral distress compared to those who were single with children (n = 11) and single without children (n = 13) for three items (Table 6).

The participants indicated significant differences between experiences of moral distress measured as the MDS-R item "*Assist another physician or nurse who, in my opinion, is incompetent*" compared to the length of their experience as a nurse in critical care (Table 7- Moral distress mean differences in work experience). Significant differences were also found for the MDS-R item "*Avoid taking action when I learn that a physician or nursing colleague made a medical error and did not report it*" compared to having supervised students during the pandemic (Table 8).

Table 5
Means and differences in CCNs experience of moral distress in relations to priorities.

Swedish MDS-R item	Priorities compared to before the pandemic			
	No different priorities set n = 10	Yes, set different priorities n = 60	Sig. p < 0.05	*F*
Continue to participate in the care of a hopelessly ill person who is being sustained on a ventilator when no one will make the decision to withdraw support	4.30	7.75	0.027	5.089
Assist another physician or nurse who, in my opinion, is incompetent	3.70	7.32	0.029	4.973
Witness diminished patient-care quality due to poor team communication	3.30	6.78	0.027	5.139
Tukey's post hoc test				

Table 4
Correlation coefficients for the 14 moral distress Items in the Swedish version of MDS-R.

	Futile care		Deceptive communication		Poor teamwork		Ethical misconduct			
Item	3	6	4	14	12	13	7	9	10	11
2	0.394	0.492								
3		0.625								
1			0.490	0.291						
4				0.302						
8					0.233	0.254				
12						0.668				
5							0.126	0.219	0.274	0.205
7								0.181	0.178	0.019
9									0.339	0.092
10										0.433

Factors in the Swedish version of MDS-R are presented following the same structure as suggested in Lamiani (2017).
To reduce the table size, items correlating to themselves are removed from display even if they are included in analyses.

Table 6
Differences in moral distress between CCNs from different types of households.

	Type of household				$P < 0.05$	
Swedish MDS-R item	A	B	C	D	Sig.	*F*
Follow the family's wishes to continue life support, even though I believe it is not in the best interest of the patient	6.00	3.36	8.70	4.83	B < C 0.029	3.202
Continue to participate in the care of a hopelessly ill person who is being sustained on a ventilator when no one will make the decision to withdraw support	7.00	4.64	10.40	7.28	B < C 0.037	2.988
Follow the family's wishes for the patient's care when I do not agree with them because of the fear of a lawsuit	0.77	1.00	4.00	1.33	A < C 0.049	2.757

A. Single without children (n = 13), **B**. Single with children (n = 11), **C**. Cohabitant without children (n = 10), **D**. Cohabitant with children (n = 37). Tukey's post hoc test.

Table 7
Moral distress mean difference for CCNs with different length of experience in reference to the item "Assist another physician or nurse who, in my opinion, is incompetent".

Length of experience as a nurse in critical care		Mean difference	Sig. $P < 0.05$
−5 years	6–10 years	1.34	N.S.
	11–15 years	−3.45	N.S.
	16- years	1.14	N.S.
6–10 years	−5 years	−1.34	N.S.
	11–15 years	−4.79	*0.037*
	16- years	−0.19	N.S.
11–15 years	−5 years	3.46	N.S.
	6–10 years	4.79	*0.037*
	16- years	4.59	*0.039*
16- years	−5 years	−1.14	N.S.
	6–10 years	0.19	N.S.
	11–15 years	−4.59	*0.039*

Tukey's post hoc test

Table 8
Comparisons in moral distress between CCNs who supervised and who did not supervise for the item "Avoid taking action when I learn that a physician or nurse colleague has made a medical error and did not report it".

Supervising during pandemic	Mean (STD)
Yes, n = 37 (52 %)	3.11 (2.62)
No, n = 33 (46 %)	1.85 (2.21)
Significance F = 4.660, $P < 0.05$	0.034

Discussion

The aim of this study was to investigate the construct validity and psychometric properties of the Swedish version of the Moral Distress Scale–Revised and to describe moral distress in an intensive care context. To intervene and reduce the negative impacts of moral distress, the first thing to do is to measure moral distress using an instrument intended for the specific construct. Moral distress is a serious and common problem among CCNs (Allen and Butler, 2016; Fumis et al., 2017) and those problems affect them in different ways (Asgari et al., 2019; Ganz et al., 2013; Henrich et al., 2017; Lawrence, 2011). Imbulana et al. (2021) identified several interventions to address moral distress, including different programs to educate ICU staff regarding moral distress in order to raise awareness of moral distress, structured exercises for reflection and debriefing as well as narrative text about moral experiences. However, no single intervention was considered efficacious in managing moral distress, because of weak evidence due to overall low methodological quality and a high risk for bias (Imbulana et al., 2021). In a review, Morley et al (2021) examined and evaluated interventions to mitigate moral distress. Results showed that the complex and subjective nature of moral distress makes the design of interventions difficult to evaluate. The lack in clarity regarding the concept of moral distress and the multifaceted nature of the concept also leads to problems in using singular interventions, which is addressed by many researchers as instead using "intervention bundles" (p.9) when trying to ease moral distress. CCNs' moral distress during COVID-19 pandemic is associated with negative psychological outcomes (Crowe et al., 2022; Kok et al., 2021; Petrisor et al., 2021) and increased risk for consider leaving current employment in ICUs (Petrisor et al., 2021). Through human resource management's perspective, Carnevale & Hatak, (2020) argues there is call for actions regarding moral distress despite those interventions not being sufficient evaluated.

Psychometric characteristics

The present study sample (n = 70) may be considered to be small, hence, making for an unstable solution. According to Hatcher (1994) sample size should be larger than five times the number of variables, which makes the sample in the present study large enough. Internal dropouts were low and thus there was no need for imputations, which reduces the risk of type-I errors (Newman, 2014). Lamiani et al., (2017) validated and developed the Italian version of the MDS-R on a sample of critical care clinicians, and they found it reliable and valid for assessing moral distress. In our Swedish version, face validity was enhanced by prior reviewing by four CCNs and a stepwise cross-cultural validity by adapted translation (Brislin, 1970).

Construct validity, examined in the present study by principal component analysis (PCA) using a covariance matrix, shows that the Swedish data result in a model of four factors like many others using the MDS-R (Giannetta et al., 2020). However, in the Swedish data, none of the suggested factors kept their item structure and thus could the hypothesised four-factor model developed by Lamiani et al. (2017) not be supported. The questionnaire was developed to assess moral distress and was validated for use in intensive care. However, data were collected using the Swedish version of the MDS-R in the third wave of the COVID-19 pandemic at a time when healthcare organisations and CCNs in ICUs had experienced unparalleled challenges for almost a year and a half. During the COVID-19 pandemic, intensive care has been conducted under almost warlike conditions Selman et al. (2020), with initially unknown treatment methods (Halpern et al., 2020), a lack of personal protective equipment and with insufficient suitable premises or policies and guidelines (Andersson et al., 2021; Lai et al., 2020). According to McCarthy & Gastmans (2015), moral distress arises from sources clustered in clinical situations, difficult working conditions and limited resources, structural conditions and moral sources. The results of our study can be viewed as a combined source of moral distress and might explain why further testing of the MDS-R, when the COVID-19 pandemic has settled, will preferably be done with a larger sample.

Moral distress

CCNs with experience of supervising during the COVID-19 pandemic reported higher levels of moral distress than those with no supervisory duties when a colleague made an error and did not report it. According to Andersson et al., (2021), CCNs emphasise skills and competence in caring for the critically ill patients and the CCNs felt a responsibility to introduce and supervise new colleagues. Especially during the COVID-

19 pandemic, this responsibility felt too heavy to bear.

Our results on CCNs experiencing moral distress in connection with additional changed priorities and enhanced responsibility during the pandemic relate to a study by Miljeteig et al., (2021) who correlates the moral distress of nurses and physicians with new responsibilities due to COVID-19. In the studies of Donkers et al., (2021) and Liberati et al., (2021), the participants experienced moral distress arising from priorities due to the work situation in the wards. The need to study the moral distress of individual CCNs in relation to organisational factors is highlighted by Maguen & Griffin (2022), who point out organisation and leadership as critical role players in preventing and healing the effects of moral distress. Given the great need for CCNs in intensive care, health care organisations should show great interest in preventing and reversing moral distress as health care workers work ability and productivity have been shown to be negatively affected by severe moral distress in a longitudinal study (Borges et al., 2021).

The results also show that CCNs moral distress regarding continuing care and life support when there is little hope for recovery was experienced differently depending on their type of household. CCNs moral distress regarding following the families' wishes for care, even though this is in conflict with their own perception, also differed depending on CCNs type of household. These findings were contrary to those reported by Spanish single resident ICU health care personnel who had children (Rodriguez-Ruiz et al., 2022) which further stresses that the protective role of the household type in difficult ethical situations should be further examined in future studies.

Limitations

There are limitations to this study that need to be considered. High workload pressure for a long time in ICU may have influenced the motivation to answer the questionnaire. As the study employed anonymous return, it was not possible to identify CCNs who did not answer the questionnaire to explore reasons for not participating at all and to carry out a dropout analysis. The sample was a convenience sample of CCNs completing a digitally distributed self-assessment questionnaire. Even if the sample size was enough for a validation study (Hatcher, 1994), further studies on larger samples is needed to confirm the psychometric structure. During the Covid-19 pandemic, researchers had to spare the ICU healthcare staff from being included in studies because they were so mentally and physically stressed, while the phenomenon of moral stress was important to investigate. The previous study (Andersson et al., 2022) used a convergent mix-method design and has conducted other analyses and presents other results than this psychometric and descriptive manuscript. However, this article can offer the readers completely different knowledge than Andersson et al., (2022).

Conclusion

Moral distress might have negative effects on CCNs working in ICUs. Measurement of moral distress allows hospital management to have a cross-sectional view of how CCNs experience ethical situations; thus, valid instruments are of great interest. The Swedish version of the MDS-R shows a new factor solution compared to previous studies. Our results highlighted the relations between CCNs' moral distress experiences and their working experience within ICUs, any supervising of students that they have done and the type of household they live in. Further research in this area is needed to understand the effects of household type on CCNs' moral distress experiences.

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CRediT authorship contribution statement

Anna Nordin: Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. **Åsa Engström:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. **Angelica Fredholm:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. **Mona Persenius:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. **Maria Andersson:** Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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