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Measuring moral distress in nurses during a pandemic: Development and validation of the COVID-MDS

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Abstract

The COVID-19 pandemic created novel patient care circumstances that may have increased nurses' moral distress, including COVID-19 transmission risk and end-of-life care without family present. Well-established moral distress instruments do not capture these novel aspects of pandemic nursing care. The purpose of this study was to develop and evaluate the psychometric properties of the COVID-19 Moral Distress Scale (COVID-MDS), which was designed to provide a short MDS that includes both general and COVID-19-specific content. Researcher-developed COVID-19 items were evaluated for content validity by six nurse ethicist experts. This study comprised a pilot phase and a validation phase. The pilot sample comprised 329 respondents from inpatient practice settings and the emergency department in two academic medical centers. Exploratory factor analysis (EFA) was conducted with the pilot data. The EFA results were tested in a confirmatory factor analysis (CFA) using the validation data. The validation sample comprised 5042 nurses in 107 hospitals throughout the United States. Construct validity was evaluated through CFA and known groups comparisons. Reliability was assessed by the omega coefficient from the CFA and Cronbach's alpha. A two-factor CFA model had good model fit and strong loadings, providing evidence of a COVID-19-specific dimension of moral distress. Reliability for both the general and COVID-19-specific moral distress subscales was satisfactory. Known groups comparisons identified statistically significant correlations as theorized. The COVID-MDS is a valid and reliable short tool for measuring moral distress in nurses including both broad systemic sources and COVID-19 specific sources.

KEYWORDS

environment and health, ethical issues, infectious diseases, instrument development and validation, methodological research, organizational structure, professional issues, systems research/multi-system issues, systems research

1 | INTRODUCTION AND BACKGROUND

During the COVID-19 pandemic, nurses were required to care for acutely ill patients with an infectious, potentially fatal, and disease, at a time of worldwide resource scarcity. The unique challenges of pandemic nursing care may have increased moral

distress among nurses. Proper measurement of moral distress in a pandemic requires instruments that capture these unique circumstances. Such an instrument was not available when the study team began an inquiry on hospital nurses' moral distress related to COVID-19. This study was designed to fill that measurement gap.

Moral distress is a widely studied phenomenon with a myriad of definitions (Morley et al., 2019). It is commonly defined by situations in which an individual's professional ethics are situationally constrained, such as when a provider feels unable to provide the quality or level of care aligned with their professional standards or ethics (Hamric, 2014; Jameton, 1993; Varcoe et al., 2012). Conflict between the individual's internal moral compass and the external work environment is a premise of moral distress. The provider may feel pressured to act in a way they feel is unethical, and they feel powerless to change the situation. Under this definition, the required elements are the moral judgment of the individual and a constrained ability to act on that judgment (Morley et al., 2019).

Recent work by Epstein et al. (2019) highlights five key components of moral distress that have been identified across a number of research studies (Epstein & Hamric, 2009; Hamric, 2014; Hamric & Epstein, 2017; Jameton, 1993; Sinclair, 2000; Varcoe et al., 2012). These are a feeling of complicity in wrongdoing (Hamric, 2014; Jameton, 1993; Varcoe et al., 2012), a lack of voice to change the situation (Sinclair, 2000), the wrongdoing is of a professional, not personal, nature (Varcoe et al., 2012), the situations are recurring—not limited to a single instance (Epstein & Hamric, 2009), and there are three levels of root causes (Hamric & Epstein, 2017). Moral distress is a strong negative emotional state, which may manifest in a variety of biopsychosocial ways. In this study it was operationalized as the extent of distress reported in response to situations that are expected to cause moral concern.

The root cause of moral distress may occur at one (or more) levels (Hamric & Epstein, 2017), including the patient/family, care team, or system (Epstein et al., 2019). Epstein et al found that the three highest ranked causes of moral distress reflected these levels. The patient-level source of moral distress ranked the highest was following the family's insistence to continue care that is not in the best interest of the patient. The second highest ranked source reflected a team source of distress: providing aggressive treatments for a patient who is likely to die when no one is taking steps to decide if withdrawing care should be considered. The third highest ranked source, reflecting system factors was caring for more patients than is safe.

In addition to usual patient care situations that result in moral distress, there are unique ethical challenges that healthcare providers face during a pandemic. Often nurses were providing care to patients who were isolated from families as a result of restricted visitation policies. This lack of family emotional support for patients caused moral distress in nurses (Jia et al., 2021).

Healthcare providers during COVID-19 were also required to balance their moral obligation to care for the self, family, and the public with high risk of contracting a contagious, potentially fatal disease in the process, a traumatic choice (Zuzelo, 2020). The nurse/family focus is unique to the COVID-19 pandemic respiratory transmission risk and introduces conflict between the nurse's professional obligation to care and personal obligation to protect self/family. The conflict arises when protection of self may diminish care quality. For example, having to wear a mask diminishes clarity of

communication and the nurse has a reduced number of times going to the patient's bedside. In this case, the nurse protects themselves and their family at the expense of the desired nursing interaction with the patient. Care delays due to donning personal protective equipment (PPE) could possibly delay a medication or treatment.

Moral distress is a growing concern in healthcare and a growing focus of research. It has been linked to provider burnout and intention to leave (Trautmann et al., 2015). Moral distress is often the result of modifiable unit/team and system characteristics, such as overly prescriptive organizational policies that reduce provider autonomy, poor interprofessional relationships, or a lack of adequate resources to provide the quality of care that meets a provider's professional standard of care (Epstein et al., 2019). Therefore, it is important to continue to measure moral distress and understand the implications of moral distress for both provider and patient outcomes. The pandemic heightened the need for research on moral distress to address the unique challenges that nurses faced during the COVID-19 emergency.

The measurement of moral distress among healthcare professionals spans two decades and includes 16 instruments (10 original and 6 adapted) used across 9 countries, including the United States, Sweden, Israel, Japan, Italy, Iran, Brazil, Portugal, and Canada (Tian et al., 2021). The Moral Distress Scale (MDS) has been the most widely adapted and validated measure of moral distress and was first developed and tested by Corley et al. (2001) to measure moral distress in intensive care unit (ICU) nurses. The MDS was modified (MDS-R) in 2012 to be inclusive of all healthcare professionals (Hamric et al., 2012). In 2019, Epstein and colleagues further revised the instrument to address the multilevel root causes of moral distress and created the Measure of Moral Distress for Healthcare Professionals (MMD-HP) (Epstein et al., 2019). The MMD-HP was adapted from the MDS-R to account for a more nuanced lens of potential root causes of moral distress among healthcare providers, including team-level and system-level root causes (Epstein et al., 2019). Despite advances in measuring moral distress, none of the existing measures have pandemic-specific content, that is, circumstances that are common in a pandemic but uncommon in nonpandemic times.

The moral distress suffered by nurses during COVID-19 care differs conceptually and operationally from moral distress experienced by nurses caring for patients in other instances of contagious illness (e.g., HIV/AIDS) or in other clinically intensive settings (e.g., emergency department, intensive care, palliative care, battlefield triage, and natural disaster trauma). The moral distress was different because the clinical conditions differed from prior infectious disease epidemics as well as natural disasters. As compared to HIV/AIDS, the COVID-19 respiratory transmission risk introduced danger of a threat of near-term death to caregivers and potentially their families. The transmission risk required complete personal protective equipment for caregivers and no visitation by family members or clergy, including during end-of-life situations. Patients did not have the social support they needed due to safety concerns with visitors. A relatively high death rate for an infectious disease within days to weeks meant that end-of-life situations were more common during a

short-term hospitalization rather than over a longer term as compared to HIV/AIDS. Due to the widespread shortages of beds and ventilators, nurses experienced the moral distress of a crisis standard of care, which requires resource allocation given scarcity. For instance, treating patients in beds placed in hallways was not an expected care setting for a severely ill patient, compromising nurses' care standards.

Additionally, conducting research with frontline providers during a pandemic requires minimally burdensome instruments given the providers are already overtaxed within the crisis. To respect providers' limited availability and to improve response rates, a short instrument is a priority. A short form moral distress instrument, however, was not available.

The COVID-MDS was developed to address these two gaps: the lack of pandemic-specific content and the need for a short instrument. The COVID-MDS supplements "general" moral distress content, as defined by Epstein et al. (2019) and earlier theorists and researchers, with situations unique to caring for COVID-19 positive patients. One key dimension of moral distress is that it involves repeated experiences, so adaptations for unique events would not ordinarily be an appropriate path. The length and intensity of the pandemic, however, gave rise to several novel situations that did occur on a regular basis. Therefore, the aim of the current study was to develop and validate a short measure of moral distress that incorporates the unique bases of moral distress that emerged from pandemic nursing care. The knowledge gained from this psychometric evaluation of the instrument will advance efforts to identify areas for intervention to prevent or mitigate moral distress.

2 | METHODS

2.1 | Setting and sample

The COVID-MDS was part of a larger survey that measured hospital organizational response to the pandemic, which included items related to workflow changes, access to personal protective equipment, and communication strategies and effectiveness. The survey was administered first in a two-hospital pilot study, then in a large multihospital national sample. Instrument testing was done in the two-hospital pilot phase followed by validation in the large national sample.

The pilot target sample size was calculated to accommodate exploratory factor analysis (EFA) methods. The COVID-MDS had 13 proposed items. Assuming a rule of thumb of 15 respondents per item, a minimum sample of 195 nurses was required. Anticipating a 25% response rate, a total of 800 nurses were invited to participate to meet the minimum required sample size. To capture variation in nurse experiences, nurses in direct patient care roles were recruited from units that had admitted COVID-19 patients, as well as units that had not treated COVID-19 patients, and from the float pool and emergency department. The pilot sample comprised 329 respondents from two northeastern academic medical centers in the last week of

September 2020 (Lake et al., 2022). The number of respondents per hospital were 82 and 256.

The validation target sample was calculated to accommodate confirmatory factor analysis (CFA) methods. Using parameters from the pilot study, we conducted a power analysis for the validation study, assuming $\alpha = 0.05$, power = 0.80, model degrees of freedom = 35, and a test of close fit, the minimum required sample size was estimated to be 278 (Preacher & Coffman, 2006). Nurses on inpatient units as well as in emergency departments (ED) and ambulatory care settings attached to hospitals were invited to participate in March and April of 2021. Nurses were asked to respond about their experiences in January 2021. The validation sample comprised 3807 nurses in 107 hospitals throughout the United States that participate in the National Database of Nursing Quality Indicators® (NDNQI®). On average, 37 nurses per hospital answered the survey (range: 1–223).

2.2 | Procedures

For the pilot study, potential participants for the pilot phase were identified by nursing supervisors selecting their nursing units purposively to include units with high and low volume of COVID-19 patients. They were contacted by email and the survey was administered through REDCap. Participants were offered a \$15 Starbucks digital gift card as an incentive to participate. Potential participants for the validation phase were identified by inviting all nursing units that participate in the annual Registered Nurse survey conducted by the NDNQI. An email was sent to eligible nurses from the NDNQI site coordinator. No incentives were offered to the validation sample. The pilot and validation phases were approved by the authors' institutional review boards.

2.3 | Measures

2.3.1 | Demographic measures

Nurses were asked to report their years of experience, type of primary unit assignment, and how many COVID-positive patients they cared for during the previous month.

2.4 | The COVID-MDS measure

2.4.1 | Description and item generation

The COVID-MDS consisted of nine items developed by the research team to measure general sources of moral distress arising from patient (four items), team (two items), and system (three items) situations or circumstances based on the framework and similar items from a prior validated instrument (Epstein et al., 2019). Additionally, four items related to ethical challenges that may be unique to

providing patient care during the COVID-19 pandemic were initially proposed. COVID items were developed with input from nurse ethicists and critical care experts and included caring for patients that present a transmission risk to the nurse's family or household, being assigned to work on a different unit requiring new skills or procedures, and caring for patients who are hospitalized without family present. All items were classified into domains of patient, team, and system-level sources based on the framework by Epstein et al., 2019 (Table 1).

2.4.2 | Administration and scoring

For each moral distress item, nurses rated both the frequency of the experience (0–3; never to often), and the level of distress that experience caused them (0–3; no distress to severe distress). The two ratings were multiplied to create an item moral distress score which ranged from 0 to 9. For the total score and hypothesized subscales, the score was calculated as the mean of the items.

2.4.3 | Content validity evaluation

The general moral distress items were considered valid based on similar items in an existing, validated instrument (Epstein). The

COVID items were evaluated for content validity to the construct of moral distress and for the relevance to pandemic circumstances by six nurse ethicist experts. These experts were recruited from an academic medical center and the American Academy of Nursing Expert Panel on Ethics. A definition of moral distress was provided. Experts were asked to rate items on relevance to the construct of moral distress and relevance to unique situations nurses may encounter while providing care during a pandemic, such as COVID-19. Response categories were not, somewhat, mostly, and highly relevant. An item-level content validity index (I-CVI) and a scale CVI (S-CVI) were calculated based on these ratings.

2.5 | Analysis

We computed descriptive statistics for all scale items for subsamples of nurses based on the frequency of care provided for COVID-19 patients. To examine the validity of the COVID-MDS, we first conducted an EFA on the pilot study data, followed by a CFA and known groups comparisons on the validation study data. Based on the results of the pilot study EFA and the conceptual framework, we examined a three-factor CFA to evaluate structural validity of the scale. The hypothesized three-factor model consisted of separate patient, team/system, and COVID-19 specific sources of moral distress. Each factor model was evaluated by examining overall model

TABLE 1 Proposed COVID-MDS items

Item	Domain	Included in CFA	Exclusion reason
1 Experiencing poor communication between members of the care team that adversely affects patient care.	Team	Yes	
2 Being assigned an unsafe number of patients to care for at once considering the acuity level for each patient assigned to me.	System	Yes	
3 Being asked to provide and continue aggressive and potentially futile treatments when I believe it is not in the best interest of the patient.	Patient	Yes	
4 Attempting to deliver a high standard of care with limited time, supplies, and resources.	System	Yes	
5 Using technology and documentation that burdens me and compromises patient care.	System	Yes	
6 Witnessing or experiencing uncivil behavior among members of the care team.	Team	Yes	
7 Caring for patients who must experience hospitalization without family presence.	COVID	Yes	
8 Caring for patients who die during a hospitalization without family and/or clergy present.	COVID	Yes	
9 Being assigned/floated to a new unit, requiring unfamiliar skills and procedures	COVID	No	Poor loading from EFA
10 Caring for COVID-19 patients that presents a transmission risk to you or your family/household.	COVID	Yes	
11 Witnessing orders for unnecessary or inappropriate care that do not adequately address patient needs.	System	Yes	
12 Witnessing a lack of respect among the healthcare team for patients from vulnerable populations or minority groups.	Team	Yes	
13 Providing care to patients who have not been adequately informed or included in decisions regarding their own care.	Patient	Yes	

Abbreviation: EFA, exploratory factor analysis.

fit using χ^2 , root mean square error of approximation (RMSEA), and comparative fit index (CFI) fit statistics. To examine the use of a total score measure in future applications, we also examined a higher-order factor structure where the underlying subscale domains reflect the broader construct of moral distress. A second CFA was conducted to evaluate the fit of a factor comprised solely of general moral distress items.

Internal consistency was evaluated using Cronbach's alpha. Intrarater reliability was also examined through intraclass correlations (ICC_{2,1}; [Shrout & Fleiss, 1979]). All CFA models were estimated using full information maximum likelihood (FIML) estimation using Mplus version 8 (Muthen & Muthen, 1998). Among included cases in the validation study, the amount of missing data was minimal (2%–4% for any moral distress query), and the level of coverage was 96%–98% across the covariance matrix. CFA models were estimated using FIML estimate to reduce bias from the small degree of missing data.

For known-group comparisons we examined mean scale score differences among nurses based on frequency of COVID patient care (daily, weekly, and several times during the month). Group differences were examined for the subscales defined through the CFA, as well as the total score. Concurrent validity was examined by correlation of the scale scores with related constructs: unit type, nurses' mental health, and intention to stay in their current position. Descriptive statistics and mean score difference tests were performed using analysis of variance (ANOVA) models fit through the general linear model procedure in SAS version 9.4.

3 | RESULTS

3.1 | Sample description

Of the 800 nurses invited to participate in the pilot study, 329 completed the survey. On average, respondents had nearly 9 years of experience ($M = 8.65$, $SD = 6.80$). The most common unit types were adult general intensive care units (77, 23.4%), the emergency department (77, 23.4%), medical (34, 10.3%), surgical (51, 15.5%), and medical-surgical combined (58, 17.6%). Most nurses reported having cared for at least one COVID-19 positive patient during the peak month (237, 72.3%), and caring for COVID-19 patients on a daily basis during the peak month (164, 69.8%). More than half reported care for more than 20 COVID-19 positive patients in total over the course of the peak month (122, 52.1%).

For the validation study, all eligible nurses within hospitals that volunteered for the study were invited to participate. Over 8000 nurses initiated the survey, and after ineligible (e.g., non-RN, nonclinical role) and incomplete (i.e., survey was open, but no questions were completed) responses were removed, there were 3807 valid responses from nurses in 107 hospitals.

Hospitals were represented from all census regions, with community (45, 44.1%) and academic medical centers and teaching hospitals (57, 55.9%). Most of the participating hospitals were general hospitals (86, 84.3%) and <300 beds (85, 83.3%). There were

relatively few rural hospitals (5, 4.9%) and a small number (6, 5.9%) of critical access hospitals.

Similar to the pilot sample, nurses worked on intensive care units (651, 17.7%) general medical surgical units (1285, 34.8%), emergency departments (389, 10.6%), and other inpatient units (1363, 37.0%). Respondents had been working in their current hospital an average of 8.5 years standard deviation ($SD = 8.58$) with 11.7 years of experience as a registered nurse (RN) ($SD = 7.63$). Nearly half (1216, 44.2%) cared for COVID positive patients on a daily basis during the month of January 2021.

EFA results from the pilot study are available from the authors.

Content Validity Results. The I-CVI scores for the three COVID scale items ranged from 83.3 to 100, and the S-CVI score was 94.4.

3.2 | Descriptive statistics for the validation study

Item means for the COVID-MDS items ranged from 0.68 ($SD = 1.48$) to 5.11 ($SD = 3.36$). Items with the lowest scores related to team interactions (e.g., "witnessing uncivil behavior among members of the care team"), while the COVID-19 specific items (e.g., "caring for COVID-19 patients that present a transmission risk") had the highest scores. Nurses that had cared for at least one COVID-19 positive patient, reported higher levels of moral distress on all 13 COVID-MDS items. Nurses who had not cared for COVID-19 positive patients still reported higher levels of moral distress on the COVID-19 specific items than on the patient and team/system factor items (See Table 3).

3.3 | CFA model results

The three-factor model specified sources of moral distress as separate patient and systems factors as well as the COVID-19 specific factor. The overall model fit for initial three-factor model was poor and examination of the standardized residual matrix indicated additional areas of association not accounted for in the model (Table 2). Specifically, associations between items on the same factors were found that were not explained by the factor loading alone. To account for these relationships, three correlated residuals were added to model. With the addition of the new parameters, the final overall fit of the three-factor model was $\chi^2 = 2332.95$, $df = 48$, $p < 0.001$; RMSEA = 0.10, CI: 0.10–0.11; SRMR = 0.06; CFI = 0.92. The standardized factor loadings for the patient factor ranged from 0.73 to 0.85, and the factor loadings on the systems factor ranged from 0.62 to 0.76. The standardized residual matrix and modification indices for the final model with additional correlated residuals did not indicate any additional areas of misfit. The factor loadings on the COVID factor ranged from 0.68 to 0.70. The α and ICC reliability statistics for all subscales exceeded 0.80. Reliability of the patient factor was $\alpha = 0.83$, ICC = 0.83, the team/systems factors were $\alpha = 0.84$, ICC = 0.83, and the COVID factors were $\alpha = 0.80$, ICC = 0.82. Reliability of the total score was $\alpha = 0.90$, ICC = 0.88.

TABLE 2 CFA results

	3 Factors		
	Team/system	Patient	COVID
Experiencing poor communication between members of the care team that adversely affects patient care.	0.76		
Being assigned an unsafe number of patients to care for at once considering the acuity level for each patient assigned to me.	0.64		
Attempting to deliver a high standard of care with limited time, supplies, and resources.	0.70		
Using technology and documentation that burdens me and compromises patient care.	0.65		
Witnessing or experiencing uncivil behavior among members of the care team.	0.62		
Witnessing a lack of respect among the healthcare team for patients from vulnerable populations or minority groups.	0.62		
Being asked to provide and continue aggressive and potentially futile treatments when I believe it is not in the best interest of the patient.		0.73	
Witnessing orders for unnecessary or inappropriate care that do not adequately address patient needs.		0.85	
Providing care to patients who have not been adequately informed or included in decisions regarding their own care.		0.80	
Caring for patients who must experience hospitalization without family presence.			0.69
Caring for patients who die during a hospitalization without family and/or clergy present.			0.70
Caring for COVID-19 patients that presents a transmission risk to you or your family/household.			0.68
Correlated Residuals			
Resources with unsafe	0.48		
Respect with uncivil	0.43		
Hospital with dying			0.53
Factor correlations			
System/team with COVID		0.71	
Patient with COVID		0.71	
System/team with Patient		0.84	
Fit Stats			
χ^2	2332.95, $df = 48$, $p < 0.001$		
CFI		0.92	
RMSEA	0.10, CI = 0.10–0.11		
SRMR		0.06	
Reliability statistics			
α (standardized)	0.84	0.83	0.80
Intraclass Correlation	0.83	0.83	0.82

The two-factor model with only general moral distress items included was specified as a patient factor and a team/system factor, and included the same correlated residuals as the three-factor model. The two-factor had similar overall model fit ($\chi^2 = 1310.04$, $df = 24$, $p < 0.001$; RMSEA = 0.11, CI: 0.11–0.12; SRMR = 0.05; CFI = 0.93). The SRMR value was indicative of good fit, while both the RMSEA and CFI were indicative of “mediocre” to “acceptable” fit (Bentler, 1990; Hu & Bentler, 1999; MacCallum et al., 1996). The standardized residual matrix and modification indices for the two-factor model with correlated residuals did not indicate any additional areas of misfit. The standardized factor loadings were essentially identical to those reported for the three-factor model (not shown in tabular form). For the patient factor these ranged from 0.72 to 0.86 and team/systems factor ranged from 0.61 to 0.78. The factor correlation between the patient factor and team/system factor was 0.83, which provides evidence that the two constructs are related but distinct. The two-factor model suggests the same items and subscales for general sources as the three-factor model, so that the internal consistency and reliability measures are the same for the patient and team/system subscales in the short form version as the three-factor version.

The higher order model was specified from the three-factor model, with loadings from each of the three factors (i.e., patient, team/system, COVID) onto a higher order factor of moral distress. The overall model fit, modification indices, and residuals are all the same as for the three-factor model. The standardized loadings for the team/system (0.91), patient (0.92), and COVID (0.78) factors are all strong, providing support for the validity of a total score measure calculating from all the items across the three underlying subscales.

3.4 | Known group analysis

Based on the results of the factor analysis, we conducted known groups testing on each of the subscales as well as the total score. Scale and item means for four groups of nurses, representing increasing frequency of COVID care (i.e., none, several times during the month, weekly, and daily) were compared using ANOVA. As expected, for the total score ($F = 95.26$, $p < 0.01$), patient factor ($F = 45.92$, $p < 0.001$), team/system factor ($F = 37.68$, $p < 0.001$), and COVID factor ($F = 166.55$, $p < 0.001$), nurses who cared for COVID patients more frequently reported higher levels of moral distress than nurses who cared or COVID-19 positive patients less frequently (see Table 3), providing additional support for the construct validity of the COVID-MDS. Furthermore, regardless of frequency of COVID care, all nurses reported higher COVID-related moral distress compared to general sources. These differences were roughly 1.5–2 times higher for the COVID-related moral distress. Notably, the item exhibiting the highest moral distress scores was caring for patients hospitalized without family members present and was the highest regardless of frequency of COVID care. On the scale, which has a hypothetical range of 0–9, the item mean was $M = 3.30$ for the total sample and

TABLE 3 Known groups analysis and scale means by COVID care frequency

	Mean (SD)	F Value	p Value
Patient score		45.92	<0.01
None	0.61 (1.26)		
Several times in the month	1.20 (1.74)		
Weekly	1.50 (1.77)		
Daily	2.03 (2.19)		
Team/system score		37.68	<0.01
None	1.04 (1.49)		
Several times in the month	1.62 (1.72)		
Weekly	1.80 (0.170)		
Daily	2.32 (1.90)		
COVID score		166.55	<0.01
None	1.23 (1.71)		
Several times in the month	2.67 (2.35)		
Weekly	3.42 (2.39)		
Daily	4.75 (2.69)		
Total score		95.26	<0.01
None	0.98 (1.27)		
Several times in the month	1.77 (1.61)		
Weekly	2.12 (1.55)		
Daily	2.82 (1.84)		

Abbreviation: SD, standard deviation.

ranged from 1.91 to 5.05 across the ordered categories of increasing COVID care frequency. By contrast, the item with the lowest reported moral distress was witnessing a lack of respect for patients from vulnerable populations, which had an overall mean of $M = 0.65$, and ranged from 0.43 to 0.93 across the COVID care frequency groups.

3.5 | Concurrent validity testing

Nurses who reported higher levels of moral distress also reported more days of feeling anxious, withdrawn, and having difficulty sleeping. Correlations across the subscales and total score ranged from 0.35 to 0.46 ($p < 0.001$ for all correlations). For nurses who intended to leave versus stay, moral distress was significantly higher. Point-biserial correlations between intention to leave and the moral distress subscales and total score ranged from 0.25 to 0.32 ($p < 0.001$ for all correlations).

Nurses working in more intensive settings (i.e., ICUs and emergency departments) experienced significantly higher levels of moral distress than nurses working other care settings (e.g., inpatient medical and surgical units).

4 | DISCUSSION

Moral distress among nurses was exacerbated as a consequence of caring for patients during the pandemic, when scarcity of resources and operational changes to processes of care put added stress on nurses' ability to provide the highest quality of care. The COVID-MDS instrument was developed to efficiently measure both the general and COVID-19 specific sources of moral distress. Results of this study provide evidence supporting the validity and reliability of the COVID-MDS tool.

Our CFA, which tested a three-factor structure, revealed two factors reflecting general sources (i.e., team/system and patient) of moral distress and a distinct factor for COVID-19-specific sources. Furthermore, the two-factor model examining general sources only, provides support for the validity and reliability of a short-form MDS. As compared to the MMD-HP (Epstein et al., 2019), which has four factors reflecting patient, intrateam interactions, team coordination of patient care, and system factors as separate sources of moral distress, the COVID-MDS provides a consolidated factor structure across patient, team, and system factors. Therefore, the MMD-HP may be a more useful instrument for robust measures of the four factors. The two-factor model offers a short measure of general moral distress that exhibits satisfactory psychometric properties. The COVID-MDS, on the other hand, offers an efficient three-factor measure of general moral distress content in addition to the unique COVID-19 content. Additionally, our test of a higher-order factor indicates that a measure of the entire set of items is optimal in pandemic times. A multifactor structure is common in these measures. Among the 16 moral distress instruments examined by Tian et al. (2021), 13 have a multifactor structure, including the original MDS, exhibiting the utility of these instruments for clinical setting evaluation and development of intervention strategies.

COVID-19 specific sources of moral distress as a separate construct captures the unique sources of moral distress that occurred during the pandemic. Our known groups results support the expectation that moral distress was higher for nurses who more frequently cared for COVID-19 positive patients than those with less frequent COVID patient care. On the total score and each of the hypothesized subscales, COVID-19 related moral distress was still 1.5–2 times higher than general sources of moral distress even for nurses who did not care for COVID-19 positive patients. The unique ethical challenges that emerged during the COVID-19 pandemic of balancing individual versus group needs with constrained resources (Berlinger et al., 2020), navigating personal risk while providing high quality care (Zuzelo, 2020), and changes to care processes or unit assignments which require new skills or knowledge (Jia et al., 2021), may have increased feelings of distress. Organizational changes to care process and safety protocols impacted all nurses, not just those who frequently cared for COVID-19 positive patients. For example, visitor policies that apply to all inpatient stays and ED visits affect even nurses on non-COVID-19 units. Caring for patients without family present was an important factor (i.e., the item with the highest

mean) for nurses who did not care for COVID-19 patients as well as those who did.

The COVID-specific items of the COVID-MDS were designed to measure moral distress caused by situations unique to the COVID-19 pandemic. In an effort to mitigate risk, the personal risk assumed by nurses and other providers during the COVID-19 pandemic influenced care processes and may have compromised the level of care that would have been provided under less extreme circumstances. Care processes that changed as a result of the pandemic include limiting the types and numbers of providers who could enter patient rooms (predominantly nurses only), clustering activities, and relocating equipment to reduce the number of times nurses must enter the patient room (Newby et al., 2020; Schroeder et al., 2020).

Each of the three COVID-MDS factors as well as the overall instrument exhibited satisfactory internal consistency. The overall instrument's reliability of 0.88 is quite high given the number of items (12). Notably, the three-item COVID-19 factor had a Cronbach's α of 0.80. These reliability values compare favorably with those of the original MDS instrument, which had reported values of 0.82–0.97 across the different MDS factors (Corley et al., 2001). The reported reliability of the MMD-HP, which contains 27 items, is higher at 0.93 (Epstein et al., 2019), but is the result of multiple revisions of the original MDS instrument.

Additional construct validity was provided through significant associations in known groups comparisons. These comparisons, which focused on frequency of COVID-19 patient care, provide particular support for the COVID-19 factor. We believe, however, that all sources of moral distress would have been exacerbated in caring for COVID-19 patients. The results support this assertion in that even the general factor score was significantly higher among nurses who cared for COVID-19 patients. These results are consistent with literature from earlier pandemics showing significantly poorer mental health among nurses providing pandemic care (Koh et al., 2005; Lin et al., 2007; Park et al., 2018).

The COVID-MDS offers a psychometrically sound measure to address important questions regarding nurses' well-being during pandemics. Questions regarding how to mitigate moral distress as well as the links from moral distress to nurses' mental health, burnout, and turnover warrant investigation. Measuring novel sources of moral distress will be important to properly address the unique challenges presented in pandemics.

Our results have implications for nurses and nurse managers. Educating practicing nurses about the unique sources of moral distress that emerge in pandemic nursing care may alleviate some moral distress. Likewise, nurse managers may find the instrument valuable in measuring their staff's degree of moral distress and considering foci for mitigating moral distress. For nurses who exhibit a high level of moral distress, their manager may examine the separate subscales to identify the major sources and levels of the distress. The manager may focus on items rated as most distressing or most frequently occurring. The manager can begin by identifying and attempting to address items that they can

personally control. For items that require higher-level authority to address, data from a validated instrument is more persuasive than anecdotal reports.

Our results have implications for research. The COVID-MDS included items that reflect the separate dimensions of patient, team, and system factors, in addition to the COVID-19 specific factors, but in a version that is less than half the length of a prominent tool for measuring moral distress, the MMD-HP. The patient/team/system factors had high internal consistency and item factor loadings. The general MDS without the COVID items, has potential for a use as a short-form version MDS. Substantive questions that have emerged regarding moral distress during this pandemic could be examined using the COVID-MDS, including how moral distress relates to nurse intention to leave and turnover and the relationship between moral distress and the work environment during the pandemic.

While the COVID-MDS was designed to measure specific situations unique to nurses caring for patients during the COVID-19 pandemic, the COVID-19 specific items are expected to have high salience in future pandemics or other crises that result in similar changes including unit reassignments, restricted visitation policies, and risks to nurse or provider safety. In such cases, the COVID-19 specific items would continue to be applicable to measure moral distress under extreme conditions.

4.1 | Limitations

Our study had several limitations. The nurse respondents, who worked predominantly in urban hospitals, do not represent nurses working in other settings. Some sources of moral distress, both general and pandemic, are not represented due to the constraints of instrument length. The construct validity would be enhanced by comparison of the COVID-MDS performance with an existing MDS such as the MMD-HP. Although the instrument was developed based on an instrument designed for all health professionals, the COVID-MDS items were developed from the perspective of the nurse's role. The COVID-MDS may need to be adapted or tested for use with nonnurse healthcare providers.

4.2 | Conclusion

The COVID-MDS demonstrated satisfactory validity and reliability as a short measure encompassing both general and COVID-19 specific sources of nurses' moral distress. The higher levels of COVID-19-related moral distress as compared to general moral distress exhibited in this sample signal the attention of managers to mitigate these sources and policies to preserve the nursing workforce. The instrument has the promise to address multiple urgent questions that emerge from the moral distress nurses endured during the pandemic. Accounting for the unique sources of moral distress in research projects and by nurse leaders is overdue.

AUTHOR CONTRIBUTIONS

Dr. Emily Cramer initially conceptualized the study. Dr. Eileen Lake designed and conducted the pilot study. Drs. Eileen Lake and Jessica Smith provided discretionary funds to acquire the pilot data. Dr. Cramer designed and collected data for the validation study. Drs. Emily Cramer, Eileen Lake, and Jessica Smith developed and refined the survey tool with significant input from Dr. Jeanette Rogowski. Dr. Emily Cramer performed the data analysis. Drs. Emily Cramer and Jessica Smith drafted the manuscript. Drs. Eileen Lake and Jeanette Rogowski contributed significant revisions and writing to the final manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

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