ORIGINAL REPORT

Nurse-sensitive indicators during COVID-19

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Abstract

Purpose: Nurses are on the forefront of delivering care to patients hospitalized with COVID-19. Nurses' impact on patient care can be discerned through assessment and documentation strategies, including structured and unstructured narratives, clinical pathways, flowsheets, and problem-based approaches. To date, there are no published reports regarding nursing assessment and documentation during the COVID-19 pandemic using an assessment framework to capture clinical decision making, nursing diagnoses, and key social determinant of health (SDoH) data. Hence, the purpose of this investigation was to conduct an exploratory nursing documentation audit of patients hospitalized with COVID-19 during the first surge to identify types and frequency of nurse-sensitive indicators, including SDoH.

Method: This pilot study utilized a retrospective chart review design at a single academic medical center, utilizing Gordon's Eleven Functional Health Patterns (FHP) framework to extract clinical, social, and nursing assessment data for patients hospitalized with COVID-19. Descriptive statistics were computed for continuous variables and counts/percentages for categorical variables.

Findings: Data from 94 patient records were analyzed. Most patients were male (59.6%), with a mean age of 58 years. Nearly 15% of patients were Black and 12.8% were Hispanic, most residing in four geographic areas. Nine of the 11 FHPs were reflected in nurse-sensitive indicators documented in the electronic health record. SDoH data were inconsistently documented, including race, education, history of neglect/abuse, and occupation.

Conclusion: The FHP framework captured many nurse-sensitive indicators during the first COVID-19 surge, although screening for and documenting SDoH data were limited.

Implications for nursing practice: Findings can influence the development of nursing assessment and documentation during crisis care delivery that are inclusive of distinct sociodemographic factors, in addition to clinical factors, to provide comprehensive, culturally sensitive care. Such documentation will enhance the use of nursing knowledge

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guided by a nursing framework to make visible the essential contributions of nurses to healthcare delivery.

INTRODUCTION

Several reports have addressed the impact of the COVID-19 pandemic on nurses, especially in relation to stress and burnout. Ample research has described nurses' responsibilities during COVID-19 as focusing on testing, isolating, and triaging patients, while providing intensive, supportive, and palliative care (Sharma et al., 2020), overlooking the central tenet of nursing practice as holistically caring for patients' diverse biopsychosocial needs. Nursing practice is grounded in the patient–nurse relationship, the exploration of pattern, meaning-making, humanization, transformation, and healing, with caring for clinical and social needs alike being the organizing principle (Newman et al., 2008; Willis et al., 2008). As such, throughout the pandemic, nurses have been on the forefront of responding to patients' entire COVID-19 illness experience—extending beyond immediate clinical needs to address all features of patients' experiences. In doing so, nurses holistically care for the multifaceted needs of patients, both in real-time, through, until, and beyond recovery. That is, nurses transcend the more clinically oriented activities of nursing practice to comprehensively recognize and act upon all biopsychosocial needs with patients, families, and communities. However, limited research has explored the features of nursing care delivered to patients hospitalized with COVID-19 during the first surge, de-emphasizing the invaluable role of the nurse in adapting and swiftly responding to complex and changing patient needs.

In April 2020, during the initial surge of the COVID-19 pandemic, one Boston-based academic medical center admitted both the highest volume and the most medically complex patients from across the Northeast United States. Staff at this medical center also evaluated and triaged patients within the Greater Boston area, an epicenter of the COVID-19 outbreak in Massachusetts (Jassar et al., 2021; Samuels-Kalow et al., 2021). Similar to national trends, the first COVID-19 surge disproportionately impacted communities of color, particularly Black/African American and Hispanic/Latino communities (Boston Public Health Commission, 2020). Owing to historical patterns of neighborhood racial/ethnic segregation and inequitable hospital access, this academic medical center historically and presently serves a majority of White patients, caring for a substantially lower proportion of patients from racial/ethnic minority groups that were impacted by COVID-19 across the region (Samuels-Kalow et al., 2021).

An increase in emergency department volume unprecedented at this institution (Baugh et al., 2020), in tandem with other complexities presented by the pandemic, necessitated rapid and coordinated responses to new needs. For example, there was an urgent need for language interpretation services, especially Spanish language interpreters, related to the high incidence of COVID-19 in Spanish-speaking communities (Samuels-Kalow et al., 2021). Additionally, multiple strategies were employed to adapt preexisting nursing documentation standards for electronic health record system (EHR) charting to decrease data collection burden and expedite care delivery (Moy et al., 2021). As a result, standard nursing admission templates were temporarily replaced with shortened assessment forms, many with predetermined, highly structured response choices to refocus the types of data collected to address immediate concerns related to COVID-19. Nursing care plans and daily charting largely concentrated on COVID-associated assessment.

Highlighting data that is both patient-centric and reflective of the comprehensive care delivered by nurses was therefore challenging because of these abbreviated documentation practices as well as the procedurally driven, critical aspects of care during the initial COVID-19 surge. This concern prompted us to explore the extent to which nurse-sensitive indicators were described in nursing documentation. Specifically, we sought to investigate the number and types of nurse-sensitive indicators that were documented to better synthesize and describe the characteristics of patients with COVID-19 through a more comprehensive, nurse-sensitive lens.

Screening for and documenting health-related social circumstances ("SDoH"), such as food insecurity or housing instability, continues to garner attention as a national imperative (Alley et al., 2016). While many healthcare organizations have created strategies to screen patients for SDoH, the achievement of universal documentation is scarcely realized. Indeed, screening for SDoH requires a different approach than screening for traditional clinical issues, which uses established diagnostic methods. Screening for SDoH often requires conversations that detect adverse experiences and circumstance that often require resources outside of the scope of traditional clinical care (Garg, Boynton-Jarrett, & Dworkin, 2016). SDoH—including race, socioeconomic status, and other social circumstances—significantly impact COVID-19-related outcomes. Thus, retaining assessment and documentation of critical SDoH data is not only integral for record keeping and description of disparities, but can also increase the capacity to provide best quality nursing care. However, in the setting of time pressure, uncertain conditions, and patient acuity during the first surge of COVID-19, it is possible that nursing assessment and documentation of SDoH data was overlooked.

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BACKGROUND

Nurses' role during COVID-19 as captured through documentation

Since the outset of the pandemic, nurses have been essential front-line workers responsible for the delivery of high-quality care and health education for patients, families, and communities affected by the virus (Dellasega & Kanaskie, 2021; Sharma et al., 2020). Nurses perform the majority of hands-on-care while exercising independent judgment, intervening, and judiciously reevaluating patients' health status and response to treatments and interventions. Nurses use knowledge from within their discipline, in concert with that of other disciplines, to provide patient-centered care within a defined scope of nursing practice. As integral members of the patient care team, nurses provide a unique, holistic approach to the assessment of patients with COVID-19 that is grounded in a synthesis of subjective and objective clinical data emerging from the nurse–patient relationship to document patient responses to the illness experience (Jones, 2012).

Gleaning insights from nursing assessment data from inpatients with COVID-19 may help identify phenomena of concern to nurses and enhance individualized, innovative care approaches that advance healing and health promotion for patients, families, and communities. Without an improved understanding and visibility of nursing documentation during the pandemic, patient care appears to lack a nursing focus, specifically the delivery of holistic, patient-family centered nursing care that reflects the complexity of the patients' response to illness and recovery (Flanagan, 2018). Although some have tried to identify through expert consensus, possible NANDA-I, Nursing Interventions Classification (NIC), and Nursing Outcomes Classification (NOC) linkages (Swanson et al., 2021) or to retrospectively identify nursing interventions for people admitted with COVID-19 using NIC taxonomy (Asghari et al., 2022), no studies to date have used an FHP framework to capture nursing data in the EHR. Hence, the purpose of this pilot study was to conduct a retrospective audit of the EHR in a subgroup of patients to describe their clinical and sociodemographic characteristics and identify the nurse-sensitive indicators retained within the truncated documentation strategies during the pandemic. Specifically, the study had two aims:

Study aims

1. To describe clinical characteristics and sociodemographics of patients admitted to general medical units during the initial COVID-19 surge at a large academic medical center.
2. To explore the number and type of nurse-sensitive indicators within Gordon's functional health pattern (FHP) assessment framework captured in crisis documentation templates during the initial COVID-19 surge.

Theoretical framework

Data collection was guided by the FHP assessment framework (Gordon, 2008), used to organize and inform nursing assessment and facilitate the progression from data to nursing diagnosis. A nursing diagnosis is a clinical judgement about individual, family, or community experiences/responses to actual or potential health problems/life processes and provides the basis for selection of nursing interventions to achieve patient outcomes for which the nurse is accountable. The FHP assessment promotes the nurse's identification of processes and interventions that integrate functional, social, psychological, and physiologic aspects of health and illness by way of 11 FHPs: (1) health perception; (2) nutrition-metabolic; (3) elimination; (4) activity/exercise; (5) sleep/rest; (6) cognitive perception; (7) roles and relationships; (8) self-perception/self-concept; (9) sexual-reproductive; (10) coping/stress tolerance; (11) values beliefs (Gordon, 2008). These patterns include key data elements (subjective and objective) that are assessed and evaluated, helping to identify tentative problems (nursing diagnoses) that are present and form a basis for holistic care planning (Jones et al., 2021). Each diagnosis informs nursing care, underscoring nurse-sensitive contributions to patient outcomes. By examining the frequency of commonly occurring diagnoses, supported by assessment data within and across patient populations (aggregate analysis), nurses may be better prepared to care for patients with specific illnesses, such as COVID-19.

METHOD

Design, sample, and setting

This exploratory pilot retrospective chart review extracted clinical, sociodemographic, and nursing assessment data from the EHRs of patients admitted with a primary diagnosis of COVID-19 from April 1 to April 30, 2020 at a large academic medical center in Boston, MA. Included patients were between the ages of 18–84 years, had a PCR-confirmed COVID-19 diagnosis, and were initially admitted to nonintensive care units. Patients were excluded if COVID-19 was not the primary diagnosis (e.g., screened positive during non-COVID-19-related admission), were directly admitted to the intensive care unit, or had clinically epidemiologically diagnosed, probable, or suspected COVID-19 not confirmed by PCR.

Sampling procedure

After receiving Institutional Review Board Approval and waiver of consent, the Research Patient Database Registry (RPDR) was used to generate a master file of patients admitted to the academic medical center with COVID-19 during the specified timeframe. The RPDR is a central, searchable electronic data warehouse containing billing and clinical records from the EHR (Epic Systems Corporation) utilized

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across the larger healthcare network (Murphy & Chueh, 2002). The RPDR is a widely used tool to identify populations of patients using International Classification of Diseases (ICD) codes and complex Boolean queries. Search terms entered in the RPDR query tool included "name of the hospital," "inpatient," "COVID-19," "ages 18–84 years," and the search was limited to the timeframe "April 1, 2020 – April 30, 2020." The RPDR yielded a sampling frame of 927 patients meeting these general criteria and provided additional patient-level data including medical record number, age, sex, race, ethnicity, primary language, marital status, zip code, and vital status.

Nurse-sensitive indicators embedded in nursing documentation could not be consistently and reliably extracted using RPDR tools because they typically are free text descriptions, which require separate natural language processing techniques to extract. To address this, we drew a proportional random pilot sample for manual EHR extraction using a random number generator (https://www.random.org/integers/). In retrospective chart review investigations, a generally recognized guideline for reliability is that pilot studies should target 10% of the overall sampling frame (Gearing et al., 2006). We conservatively estimated that a pilot sample of 12.5% would allow for attrition based on eligibility requirements, yet still be representative of the study population.

Data collection

A team of nurses and research assistants screened the EHR to confirm eligibility and extracted sociodemographic and clinical information via a preconstructed Research Electronic Data Capture (REDCap) database. Abstracted clinical data included:

1. *Demographic data*: level of education, occupation, type of housing, insurance status, need for interpreter, household composition, religious affiliation and spiritual care consult requests.
2. *Clinical information*: diagnosis, length of stay, travel history and other COVID screening factors, BMI, vital signs, oxygen requirements, comorbidities, allergies, substance use history, fall history, abuse/neglect history, functional status, mood/affect data.
3. *Outcomes*: death or discharge, and discharge disposition (e.g., home, rehabilitation, skilled nursing facility or hospice).

The team prioritized nursing-exclusive assessment templates within the EHR, including flowsheets, validated scales (e.g., Morse Fall Scale) and nursing admission, progress, and discharge notes to capture additional key nursing assessment data identified and organized by the FHP assessment (Gordon, 2008). Elements of each of the 11 FHPs were identified a priori as part of inpatient nursing assessment standards and organized according to pattern. The presence or absence of these elements as well as descriptors were additionally recorded in REDCap. REDCap entries were regularly audited for accuracy until interrater reliability reached a threshold of 85%. All missing data was audited and corrected when available.
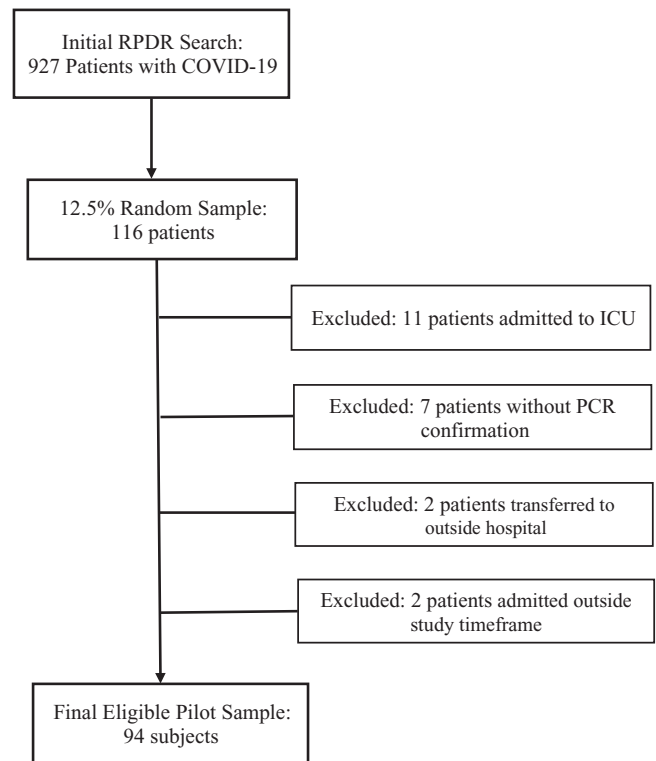
FIGURE 1 Sample determination flow diagram

Data analysis

Data were analyzed with SAS 9.4 (SAS Institute, Cary NC). Descriptive statistics (means, standard deviations, median, and range) were computed for continuous variables and counts and percentages were calculated for categorical variables.

RESULTS

Sociodemographics

A total of 927 patients identified through RPDR formed the sampling frame. One hundred and sixteen patients (12.5%) were randomly selected for further chart review; 22 of these patients were excluded upon further scrutiny of eligibility criteria (Figure 1). The final pilot sample consisted of 94 patients (10%). Pilot sample demographics did not differ significantly from the sampling frame; more than half were male (59.6%) with a mean age of 58 years (Table 1). Missing data were largely limited to race and ethnicity. More than half (58.5%) of the sample identified as belonging to a racial and/or ethnic minority background; 34.4% of the sample had documented requests for interpreter services. More than half of the sample resided in one neighborhood within Boston (East Boston) and three nearby cities outside of Boston. All but 3.2% of the sample was insured through private or public health insurance. Specific details pertaining to sociodemographic characteristics are contained in Table 1.

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TABLE 1 Admission demographics and clinical characteristics

Demographics	Total admissions N = 927 n (%) Mean [Range]	Pilot subsample N = 94 n (%) Mean [Range]	p-Value
Age (years)	57 [19-84]	58 [22–84]	0.6492
Sex			
Female	376 (40.6)	38 (40.4)	0.9797
Male	551 (59.4)	56 (59.6)	
Race/Ethnicity[a]			
White		32 (34)	0.5715
Other	398 (42.9)	24 (25.5)	
Black/African American	226 (24.4)	14 (14.9)	
Hispanic	104 (11.2)	12 (12.8)	
Unknown or missing	83 (9)	7 (7.4)	
Asian	81(8.7)	5 (5.3)	
Native Hawaiian /other Pacific Islander	30 (3.2)	0 (0)	
American Indian / Alaska Native	3 (0.3)	0 (0)	
Primary Language			
English	499 (53.8)	51 (54.4)	0.4251
Spanish	332 (35.8)	35 (37.2)	
Other Language *most frequent below	70 (7.6)	8 (8.5)	
Haitian Creole	22 (2.4)	3 (3.2)	
Khmer	7 (<1)	3 (3.2)	
Mandarin	3 (<1)	1 (1.1)	
Russian	2 (<1)	1 (1.1)	
Unknown	26 (2.8)	0 (0)	
Marital status			
Married/civil union/life partner	373 (40.2)	55 (58.5)	0.0657
Single	342 (36.9)	25 (26.6)	
Divorced	75 (8.1)	5 (5.3)	
Separated	22 (2.4)	1 (1.1)	
Widowed	44 (4.7)	5 (5.3)	
Other/declined/unknown	71 (7.6)	3 (3.2)	
Highest frequency patient zip codes[b]			
Chelsea, MA	180 (19.4)	18(19.1)	0.8723
East Boston, MA	123 (13.3)	14(14.9)	
Revere, MA	95 (10.3)	12(12.8)	
Everett, MA	61 (6.6)	5(5.3)	
Median household income by zip code[c]			
<28,000	3(0.32)	1(1)	0.4423
28,000–52,999	25(2.7)	4 (4.3)	
53,000–85,999	683(73.7)	66 (70.2)	
86,000–141,999	197(21.3)	22 (23.4)	
>142,000	19(2.1)	1 (1)	

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TABLE 1 (Continued)

Clinical characteristics (subsample only, N = 94)	n (%) Mean [Range] (SD)
COVID Screening factors at presentation[d]	
Trouble breathing/new cough	66 (70.21)
Fever past 24 h	62 (65.96)
Other misc. symptoms	52 (55.32)
Nausea, vomiting, or diarrhea	43 (45.74)
Rash	4 (4.26)
Travel outside US in last 30 days	2 (2.13)
Length of Stay (days)	10 [1-64] (12)
Non-English speakers (n = 43), interpreter source:	
Hospital interpreter	16 (17.2)
Mobile translation/telephone interpreter service	15 (16.1)
Other	1 (1.1)
Unknown/missing data	11
Primary Insurance	
Public	58 (61.70)
Private	33 (35.11)
No insurance	3 (3.19)
Patient status at time of discharge	
Alive	81 (86.17)
Deceased	13 (13.83)
Discharge Disposition[e]	
Home	46 (48.94)
Skilled nursing facility or rehabilitation	24 (25.53)
Home with services[f]	11 (11.70)
Known comorbidities to COVID 19 severity[d]	
Heart conditions	64 (68.09)
Obesity (BMI ≥ 30)[g]	41 (43.62)
Diabetes (type 1 or 2)	29 (30.85)
Chronic kidney disease	14 (14.89)
Dementia or other neurologic disease	14 (14.89)
Liver disease	13 (13.83)
Chronic lung disease	11 (11.70)
Hemoglobin-based blood disorders	8 (8.51)
Cancer	3 (3.19)
HIV infection	1 (1.06)
Body Mass Index (BMI)[g]	
≥30 (obese)	41 (43.62)
25.0–29.9 (overweight)	38 (40.43)
18.5–24.9 (normal)	14 (14.89)

[a]While captured in separate EMR data fields, the "race" field captures Hispanic/Latino as a racial category in addition to White, Black/African American, Asian, Native Hawaiian /other Pacific Islander, American Indian / Alaska Native while the "ethnicity" field conflates other dimensions of identity such as culture, ancestry, and country of birth. The "race" field allows for only one selected option; thus if a patient identified as "Hispanic" they were unable to additionally report their race.

[b]These towns/neighborhoods contributed ~50% of patient volume during the April 2020 surge.

[c]Median household income was computed at the zip code level; zip codes were extracted from the EHR and median household income by zip code—per the U.S. Census Bureau 2019 American Community Survey 5-year estimates/household income quintiles—is reported.

[d]Multiple possible per subject.

[e]Alive subjects only.

[f]Skilled nursing, respiratory therapy, PT/OT.

[g]Data missing on one subject.

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Clinical characteristics

The most common screening factor at arrival to the hospital was trouble breathing/new cough (70.2%), followed by fever (65.9%). The average length of stay was 10 days. The most commonly occurring comorbidities were heart conditions (68.1%) and obesity (43.6%). See Table 1 for additional clinical characteristics.

Outcomes

Most of the sample (86.2%) survived to discharge, with nearly half (48.9%) discharged home without services, followed by discharge to a skilled nursing facility or rehabilitation (25.5%) or home with skilled nursing, respiratory, or physical/occupational therapy services (11.7%).

Nursing assessment by FHP

Nine of the 11 FHPs had nurse-sensitive indicators documented in the EHR with sexuality and self-perception/self-concept data consistently undocumented (100% data missing; see Table 2). While some indicators, particularly the FHP health perception/health management, were focused on COVID-19 screening such as comorbidities, recent travel, and signs and symptoms of COVID-19, many of the clinical indicators point to areas in which inpatient nursing care is also strongly focused, for example, safety, mobility, elimination, skin integrity, and activities of daily living. For example, 99% of the sample was assessed for skin issues and a history of incontinence. Between 87 and 9% of the sample were assessed for the need for support in activities of daily living. Nurses assessed and documented information on certain clinical features in 90–100% of patients, including comorbidities (100%), current fever (100%), skin condition (99%), fall history (99%), oxygen saturation (99%), pulse rate (99%), and gait assessment (99%). Nurses also assessed certain sociodemographic factors in 100% of the sample, including sex (100%), age (100%), and language spoken (100%). Nurses also assessed limited SDoH in >90% of the sample, including ethnicity (93.6%), need for an interpreter (88.3%), and household composition (93.6%). However, many critical SDoH assessment opportunities were missed. For instance, occupation was never documented, and only limited records contained education level (7.4%). Other SDoH data like race (57.7%), and queries into history of neglect (food, clothing, health care; 71.3%), history of physical/emotional abuse (66.0%), current physical/emotional abuse (74.5%), and alcohol use (88.3%) were inconsistently documented. We provide a detailed list of the 11 FHPs and key nursing assessment data found for each in Table 2.

DISCUSSION

Key results

The average age in the pilot sample was 58 years. Unfortunately, comparisons with national trends is limited because data on age dis-

tributions in the early pandemic period (January—April 2020) were excluded from national reports because of inconsistent COVID-19 testing availability (Boehmer et al., 2020). However, this sample reflected broader national norms in terms of prevalence of comorbidities such as heart conditions and obesity that have been shown to contribute to the severity of COVID-19 (Simonnet et al., 2020; Xu et al., 2021). Much of the sample resided in geographic areas that are largely comprised of people from diverse racial and ethnic backgrounds, including several minority/majority areas. Given that across the United States, racial/ethnic minority populations experienced higher rates of COVID-19 positivity, disease severity, and worse outcomes compared to White populations (Ingraham et al., 2021; Magesh et al., 2021), this demographic shift is concordant with national trends in the disproportionate impact of COVID-19 on communities of color. Of note, our data showed that racial identification was documented in just over half (57.4%) of patients in this sample. Complete documentation of race/ethnicity data represents a first step toward accurately identifying and describing disparities, and then targeting nurse-led interventions that promote racial/ethnic health equity (Flanagin et al., 2021).

Language barriers between patients and nurses impact nursing practice, influencing both patient satisfaction and quality of care (Squires, 2018). Among patients receiving care within this academic medical center, the need for interpreters increased nearly fourfold from 9% of patients accessing interpreter services prepandemic to 29–35% of patients during the surge (Betancourt, 2020; Samuels-Kalow et al., 2021). Nurses responded to this shifting need by documenting language spoken in 100% and need for an interpreter in 88.3% of this sample. Through concerted attention toward language-related needs, nurses were poised to best respond to potential language-related barriers to optimizing patient–nurse communication.

While nurses excelled in assessing and documenting language needs, equally pertinent SDoH-related needs were not as consistently documented. Specifically, education level was assessed and documented in only 7.4% of patients; occupation, often associated with education level, was never (0%) documented in our sample. Given the widening gap between educational attainment and health outcomes (Zajacova & Lawrence, 2018), particular attention to educational access and attainment as a SDoH is imperative to addressing health disparities (CDC, 2021). Nurses' contribution to educating patients about health and wellness cannot be overstated (Flanders, 2018), and assessing and tailoring educational interventions to the appropriate literacy level is critical for improved patient outcomes.

Nurses documented neglect related to food, clothing, and health care in 71.3% of patients, and current (74.5%) or past (66%) physical/emotional abuse in most patients. Nurses play a central role in identifying and intervening to address neglect and abuse in crisis and noncrisis times alike. Ensuring that nurses are universally assessing and documenting needs related to patient experience of neglect and abuse facilitates better care coordination in addressing social health needs.

Lack of documentation on occupation/employment suggests that the focus of data collection was on the critical, episodic, and more clinically oriented care versus a holistic nursing approach that may better guide decision making around suitability to return to work, short term

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TABLE 2 Nursing assessment data captured—elements documented, organized by functional health pattern

Functional Health Pattern	Conceptual elements identified in nursing documentation	Number of records documenting concept N = 94
		n (%)
Health Perception/Health Management Describes patient's perceived pattern of health and well-being and how health is being managed.	Comorbidities	94 (100)
	Pre-admission travel	85 (90.43)
	Contact with known/suspected case	78 (83)
	Pre-admission COVID symptoms:	
	fever	87 (92.6)
	trouble breathing/new cough	86 (91.5)
	nausea, vomiting, diarrhea	84 (89.4)
	rash	84 (89.4)
	other	84 (89.4)
	Sex	94 (100)
	Ethnicity	88 (93.6)
	Race	54 (57.4)
	Language spoken	94 (100)
	Need for interpreter	83 (88.3)
	Age	94 (100)
	Occupation	0 (0)
Nutrition-Metabolic Describes pattern of food and fluid consumption relative to metabolic need and pattern; indicators of local nutrient supply.	Food allergies	94 (100)
	Current temperature	94 (100)
	BMI	93 (99)
	Alcohol use	83 (88.3)
	Presence of rash	84 (89.4)
	History of nausea, vomiting, diarrhea	84 (89.4)
	Fever history	87 (92.6)
	Skin condition	93 (99)
Elimination Describes patterns of excretory function (bowel, bladder, and skin). Includes patient's perception of "normal" function.	Presence of indwelling catheter	92 (97.9)
	History of incontinence	93 (99)
Activity – Exercise Describes patterns of exercise, activity, leisure and recreation.	Fall history	93 (99)
	Assistance level - toileting	88 (93.6)
	Assistance level - mobility	91 (96.8)
	Assistance level - hygiene	82 (87.2)
	Assistance level - feeding	87 (92.6)
	Activity level, daily typical	93 (99)
	Activity tolerance - O2 saturation	93 (99)
	Activity tolerance – pulse rate	93 (99)
	Gait assessment	93 (99)
Cognitive – Perceptual Describes sensory-perceptual and cognitive patterns.	Education level	7 (7.4)
	Level of consciousness	90 (95.7)
	Hearing	43 (45.7)
	Orientation	88 (93.6)
	Vision	40 (42.6)

(Continues)

TABLE 2 (Continued)

Functional Health Pattern	Conceptual elements identified in nursing documentation	Number of records documenting concept N = 94
	Cognition	92 (97.9)
	Speech	92 (97.9)
Sleep – Rest Describes patterns of sleep, rest, and relaxation.	Sleep quality	80 (85.1)
Self - Perception / Self – Concept Describes patient's self-concept pattern and perceptions of self.	None	0
Role – Relationship Describes patient's pattern of role engagements and relationships.	Housing type	94 (100)
	Sick contacts	78 (83)
	Marital status	91(96.8)
	Household composition	88 (93.6)
Sexuality – reproductive Describes patient's patterns of satisfaction and dissatisfaction with sexuality patterns; reproductive pattern.	None	0
Coping / Stress tolerance General coping pattern and effectiveness of pattern in stress tolerance.	Patient behavior/mood	91(96.8)
	Patient concerns	94 (100)
	Physical/emotional abuse (current)	70 (74.5)
	Physical/emotional abuse (past)	62 (66)
	Neglect (food, clothing, health care)	67 (71.3)
Value – belief Patterns of values, beliefs (including spiritual), and goals that guide patient's choices or decisions.	Religious affiliation	76 (80.9)
	Need for spiritual care visit	75 (79.8)

needs following discharge, and potential for financial strain. Despite the presence of some nurse-sensitive indicators found within most of the FHPs, there is also an absence of detail, and some FHPs such as sexuality and self-perception/self-concept are absent altogether. For example, under the FHP for value-belief (Table 2), there is no information on personal ideals that could help establish patient-centered goals of care. While household composition was assessed and documented under role/relationship it likely reflected more immediate concerns for quarantine and isolation and not a more holistic concern for place-based social, behavioral, and environmental influences on the patient's health and well-being. Altogether, although nursing care adequately addressed the immediate clinical needs of patients with COVID-19, results reflect opportunities to better address more complex biopsychosocial health needs of people who may be at higher risk for poorer outcomes.

Strengths and limitations

This study has several limitations. First, the study design was retrospective and exploratory and reflects the experience at a single academic medical center, without a comparator standard of noncrisis nursing documentation. Second, documentation of nurse-sensitive data is challenging in a crisis, extracting this data retrospectively

from charts decreases precision due to both the limited response sets in structured admission templates as well as inconsistent reporting in nontemplated, free-text narratives typical of nursing progress notes. Furthermore, due to the way that race and ethnicity data were captured in the EHR fields, the race/ethnicity data of this sample was likely underreported. While captured in separate EHR data fields, the "race" field captured Hispanic/Latinx as a racial category in addition to Black/African American, Asian, White, among others, while the "ethnicity" field conflated other dimensions of identity such as culture, ancestry, and country of birth. The "race" field allows for only one selected option, thus, if a patient identified as "Hispanic," they were unable to additionally report race. For example, a person who identified as Black AND Hispanic would be able to report one or the other identity. Still, the demonstrated racial/ethnic diversity of the sample is a strength of the study.

Data ultimately show the ability of nurses to document key aspects of the FHP assessment framework, tailored to the unique circumstances of the pandemic. However, there is a limited approach to holistic nursing assessment as reflected in the nurse-sensitive indicators that were found, which did not consistently capture important SDoH data. While organizing the data in a nursing focused FHP framework grounded the study to focus on activities of nursing practice, the nurse-sensitive indicators suggest a lack of nursing visibility around specific phenomena of concern to nurses such as overall state of health

and wellness and SDoH, including housing availability and stability, transportation availability, health literacy, social support systems, education and employment status, and other personal and community characteristics that contribute to health outcomes. This suggests that there were either opportunities where nurses provided more comprehensive person-centered care and did not document this care or were not able to provide such care due to the potential acuity surrounding the surge in admissions of patients with COVID-19.

Implications for clinical practice

There are noteworthy clinical, education, and research implications of this pilot study. First, there is a need for critical appraisal of the patient assessment and data collection forms utilized to ensure pertinent SDoH are assessed and documented in addition to clinical health assessment. Establishing a nursing assessment form that pragmatically facilitates collection of SDoH is essential for the nurse's ability to provide comprehensive holistic care to patients from diverse racial/ethnic and socioeconomic backgrounds. Prioritizing a holistic patient assessment inclusive of sociodemographic and clinical health data, especially during the time of a health crisis, allows for transparent nursing documentation and development of care plans that are designed to promote health equity and address biopsychosocial health needs. Capturing multifaceted assessment data highlights the unique data elements that nurses utilize during their patient encounters to promote humanistic care and well-becoming.

The absence of certain nursing assessment data elements exposed in this study also highlights the need for further education on the importance of documentation of SDoH and the interface between SDoH and clinical health outcomes. Education in this regard may improve motivation and adherence to SDoH data collection and inform practice change, patient education and ultimately, successful patient outcomes. Further, many patients in the sample reported multiple, preexisting comorbidities, increasing the potential impact of COVID-19 on health outcomes. Findings signal an opportunity for nurses to reexamine their role in health promotion and illness prevention. Thus, the enhancement of nursing curriculum that reinforces the importance of recognizing the acute diagnosis in the context of the patient's past medical history and sociodemographic characteristics will optimize nursing care delivery.

Nurses play a critical role in restructuring care delivery models both in the acute care setting and in the community. The COVID-19 pandemic created an opportunity to reflect on nursing assessment and documentation for patients in all care environments. Future research should explore nurses' experiences of providing holistic care during the pandemic as well as barriers and facilitators to doing so. Consideration of nursing frameworks that facilitate the nurse–patient relationship and focus on knowing the whole person will strengthen and improve health outcomes/equity for all (Jones, 2012). This holistic approach would provide needed information to adapt EHRs to better capture the multifaceted work of nurses. Refining EHR documentation strategies

to reflect nurses' focus on the whole person may underscore nurses' unique contributions beyond the activities they complete.

Conclusion

Findings from this study are the first to describe the documentation of nurse-sensitive indicators during the initial surge of the COVID-19 pandemic. Using the FHP framework to capture clinical decision making, nursing diagnoses, and key SDoH data, we identified critical documentation gaps, including documentation of specific SDoH that are needed for nurses to continue to provide holistic, equitable care and education to patients. Findings have potential to inform strategies for nursing documentation during times of crisis care delivery that are not limited to clinical needs, and instead, inclusive of distinct sociodemographic factors needed to provide comprehensive and culturally sensitive care. Guided by a nursing framework, such documentation will enhance the use of nursing knowledge to make visible the essential contributions of nurses to healthcare delivery.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS
All authors adhered to the IJME guideline for authors and were involved in conception, analysis, and manuscript preparation and revision. Conception and design: GB, DC, KD, JF, DJ, SL, JC Acquisition of data: JC, DC, GB, KD: Analysis and interpretation of data: GB, DC, KD, JF, DJ, SL, JC Manuscript preparation and revision: GB, DC, KD, JF, DJ, SL, JC.

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