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Home Health Nursing Information Behavior in a Historic Time of Pandemic: Shifting Taxonomic Facets

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Abstract: The COVID-19 pandemic affected information-based applications that became critical tools for survival. Nursing information behavior (NIB) during the pandemic was analyzed through textual data culled from news videos and interviews with frontline homecare nurses in terms of how they practiced home care in the midst of COVID-19. Did the NIB conceptual framework change for nurses during COVID-19? There were shifts in concentrations in the taxonomic facets during the pandemic. The present study aimed to explain the contextual changes in emphasis in the various processes and taxonomic facets in home health nursing, as influenced by the pandemic. Outcomes of the qualitative analysis of video transcripts offer the readers an understanding of how nurses adapted to the pandemic. Co-word analysis of the video transcripts was used to map twenty new terms to the Core Taxonomy-NIB (CT-NIB). The addition to the core taxonomy of an emotive layer combined with pandemic-specific nursing practices suggests certain

shifts, cultural and otherwise, in NIB. The significance of this research lies in the "intertwining" of knowledge organization (KO) and NIB—two disciplines creating a synergistic effect to not only describe the effect of the pandemic but also to advance the knowledge base of home health nursing.

1.0 COVID-19, Information, Taxonomy

The world continues to experience the long-term effects of the global COVID-19 pandemic, affecting every aspect of life—social, economic, academic, and even health (Singh and Singh 2020). Early on it was clear that information-based applications were not only affected but would be critical tools for survival. Our research was focused on the continuing shifting of taxonomies in front-line essential home health nursing. [1] In particular, the authors of this current research looked at nursing information behavior (NIB) during the pandemic through textual data culled from news videos and interviews with frontline homecare nurses in terms of how they practiced home care in the midst of COVID-19. There is a well-documented history of decades of home health nursing (Pajarillo 2005). As the prominent role of home health nurses became apparent early in the pandemic, we sought to visit the conceptual framework of nursing information behavior (NIB) presented by Pajarillo (2005) and extracted a NIB taxonomy, which we then used as a guide to follow pandemic-fueled changes in home health nurses' perspectives of home care and the manner in which they practiced home health nursing.

1.1 Nursing Information Behavior (NIB)

Nursing information behavior or NIB (Pajarillo, 2020a; Pajarillo, 2020b; Pajarillo, 2008) is a conceptual framework used to collectively describe the actions and steps taken by nurses to fulfill information needs encountered in their daily professional responsibilities in order to provide safe and quality care. Nurses collect, organize, manage and interpret data and information in almost 90% of what they do. Examples of these are shift-to-shift reports regarding physiologic, hematologic, neuropsychologic, nutritional, fluid and electrolyte, integumentary, mobility, prognosis, crises or fluctuations in health conditions of patients under their watch; assessments of patients during the start of their shift, intermittent periods of the day, transfer, or discharge; and, gathering information and data prior to a procedure, medication administration, or consult. This is an important concept as it provides guidance and structure to nurses as they conduct their daily business of providing nursing care to different types of populations, particularly in the challeng-

ing context of the COVID-19 pandemic, its variants and sub-variants. Did the NIB process change for nurses as they go about their professional work?

The NIB conceptual framework, after the identification of information needs, consists of finding appropriate resources (whether Internet sites, electronic databases, books, unit protocols or colleagues and other healthcare professionals). The advent of computer-tablets that nurses carry while working in the community serve as their electronic medical record and access to the Internet to search for relevant information needs. The information is then sifted and organized, for the rest of the process to proceed, e.g., analysis, interpretation and use.

In a prior study, Pajarillo (2020a, 23) described these actions to take place in a professional environmental space (PES), or the setting where the patient-provider interaction occurs. Depending on the type of community where the homecare nurse works, the conditions and circumstances within the PES can change. Examples of variations in the PES are not having a readily accessible pharmacy, an increased crime rate, etc. Nurses adopt to the particular PES and consequently in how they conduct their NIB. Some nurses might not sit in their car to access information using their computer-tablet or showing medications and syringes in a PES where there are many individuals behaving suspiciously. At the height of COVID-19, the PES was likewise extremely affected when streets were deserted, patients leery about letting homecare nurses come into their homes, and there was hesitance to touch doorknobs for fear of getting contaminated (particularly at the time when the mode of transmission was not well known). These steps are in the nub of NIB, namely: uncovering, discovery, and recovery (62). Briefly, uncovering is the moment when the nurse realizes there is a knowledge gap that requires information to be accessed. The action of looking, searching and accessing information, also referred to as discovery, leads the nurse to various sources and finds the appropriate information. Other steps come into play until this information is at the level and format that it is useful to bridge the knowledge gap. Once the information is used and applied to the situation, the next step is recovery, or the culmination of the information behavior process. The nub of NIB continues, once the nurse encounters a new information driver. Conducting the nub of NIB in a PES affected by COVID-19 af-

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fected the cognitive, behavioral and emotional aspects of the homecare nurse. There was fear, paranoia, hesitation, anger, indecision, and other behaviors. These resulted in nurses changing usual protocol, activities and tasks in order to adopt to the shifts in the PES. It took a lot of creativity and resourcefulness to make these variations without compromising the care and safety of their patients.

2.0 NIB Taxonomy

A prior study (Smiraglia et al., 2020) examined video recordings of news reports regarding the work of home health nurses, and compared these with the core taxonomy (CT) developed by the same research team from Pajarillo's (2008) original study. The concepts were predominantly stable between the analysis conducted by Smiraglia et al. (2020) and the Pajarillo (2008) research. However, there was evidence that there were shifts in concentrations in the taxonomic facets identified in the former study. This present research aimed to explain the contextual changes in emphasis on the various processes and taxonomic facets in home health nursing, as influenced by the pandemic. The outcomes of the qualitative analysis of video transcripts will offer the readers an understanding of how nurses adapted to the pandemic through the thematic analysis of qualitative data obtained from the video recordings. Results offer recommendations on what actions nurses use to become more resilient in order to address disruptions in their care of patients.

Detailed reports of our work appear in Milonas et al. (2020; 2022) and Smiraglia et al. (2020; 2021; 2022). The "Core Taxonomy of Nursing Information Behavior (CT-NIB)" was published on IKOS' website on 12 May 2020. Subsequently, the professional *NANDA International Nursing Diagnoses and Classification* was used to map our taxonomy (https://knoworg.org/a-core-taxonomy-of-nursing-information-behavior-ct-nib-version-1-1/). Figures 1 and 2 provide a partial glimpse of the CT-NIB Taxonomy.

3.0 Newscast Homecare Nursing Video Representations

To discover what was happening in home health nursing during the first year of the pandemic, an ethical approach was taken to avoid direct contact with active and overworked nurses. Instead, we discovered a rich collection of video representations, mostly interviews from newscasts (Smiraglia et al. 2021 and 2022). Through a deliberately triangulated search project we identified a set of 45 videos containing interviews and panel presentations. In effect, we employed a version of Cognitive Work Analysis (CWA), a set of qualitative techniques for analyzing a domain from its interior by observing the domain ontology literally "at work" (Smiraglia 2015, 92.). Analyzing Rassmussen and his colleagues' work on CWA, Naikar (2017) observed that "this framework considers the constraints on actors' behavior to be the primary unit of analysis for design, rather than the

2.0 Core Taxonomy

CT-NIB 1.1				NANDA-I Nursing Diagnoses			
Facets	Subfacets	Phenomena	Glossary Definitions	Domain	Class	Diagnosis	Page
actions							
	interaction	negative correlation					
		nurses agreed					
		information encountering	Information encountering – an information behavior model defined as a memorable experience of an unexpected discovery of useful or interesting information (p. 473).				
		interaction between the nurse					
		interpersonal relations		11 – Safety/protection	3 – Violence	00140 – Risk for self-directed violence	462
				11 – Safety/protection	3 – Violence	00151 – Self- mutilation	463
				11 – Safety/protection	3 – Violence	00139 – Risk for self-mutilation	465
		patient interaction					
		correlated positively					
		nurse and the patient					
	behavior	behavior of home care nurses					

Figure 1. A partial glimpse of the CT-NIB core taxonomy.

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3.0 Alphabetical list of Phenomena

Phenomena	Facets	Subfacets
adjuncts	agents	staff
agency	agents	entity
behavior of home care nurses	actions	behavior
care nurses	agents	staff
care planning	processes	processes
client	agents	patient
clinical practice	agents	governance
clinical specializations	care	skill
comfort and skill level	care	skill
comfortable and skillful	care	skill
community resources	resources	resource
components	resources	resource
computer issues	agents	influencers
conduits	agents	influencers
contextual background	care	information
core processes	processes	processes
correlated positively	actions	interaction
critical thinking	processes	processes
daily stressors	agents	influencers
data gathering	care	information
discharge	care	occurrence
discovery	care	information
drug reference	care	information
education	care	information
electronic mail	resources	tool
environmental scanning	processes	processes
expertise in other clinical	care	skill
factors	agents	influencers
family members	agents	patient
figure	care	information
findings	care	information
framework	processes	processes
frequently occurring information	care	information
full-time nurses	agents	staff

Figure 2. A partial glimpse of the CT-NIB alphabetical index of phenomena.

details of those behaviors." We evaluated the contextual vocabulary of the interview transcripts without regard to the affective dimensions of speaking. An important consideration when deciding to take this approach was the recognition that all reporters were health workers possessing in-depth professional 'background knowledge.' This phrase denotes a form of knowledge that exists in the person's mind (Rapaport 2003).

The research team conducted online searches for video content pertaining to home health nursing during the COVID pandemic utilizing slightly different methodologies as a form of triangulation. The date range used by the research team was mid-March to late May 2020. Researcher 1 searched the Google search engine using the terms "home care," nursing," and "COVID." The "Videos" option was selected from the "More" drop-down menu found at the top of the search results page and analyzed the videos returned. Only videos relevant to the topic of home health nursing during the COVID crisis were included and videos related to nursing homes or nurses in nursing homes were excluded. Researcher 2 chose YouTube as a data source due to the high representativeness of materials and the abundance of relevant videos. The query expression "home care nurses YouTube video" was used to generate over 112,000,000 results and selected a small subset of videos that met two criteria: 1) videos containing narratives describing more than one aspect of home health nursing activities, such as COVID-19, pediatric care, and geriatrics care; and 2) videos which were accompanied by a transcript. Not all selected videos met the second criterion. Researcher 3 used the Google search engine and the category for "Video." The search terms used were "COVID" and "visiting nurses." All search results were evaluated to determine their relevance.

The team compiled a list of videos and discarded duplicates, ultimately selecting a total of 42 videos for the study (see Appendix 1). Transcripts of these videos were generated, with approximately half of the videos found on YouTube, many of which had accompanying transcripts. The remaining videos were found on the websites of various news agencies and nursing organizations. When transcripts were not available, the team used the Google Docs voice transcription function. A transcript of each video was either downloaded or generated and the transcripts were then analyzed using co-word analysis and two independent rounds of open coding.

3.1 Co-Word Analysis of the Transcripts Points to New Vocabulary

Co-word analysis is a visualization technique used in domain analysis to help reveal underlying facets in a knowledge base. Terms from the domain are analyzed for co-occurrence, including proximity or distance in co-occurrence, and multidimensional scaling (MDS) is used to create three-dimensional visualizations of critically co-occurring clusters. The co-word analysis of the video transcripts was reported preliminarily in Milonas et al. (2020). The Provalis ProSuite (https://provalisresearch.com/products/prosuite-text-analytics-tools/) was used (detailed instructions appear in Smiraglia 2015). Full texts of the narratives were loaded in pdf format using the QDA Miner module, then keywords and phrases were extracted using the WordStat module. The transcripts contained over 33,000 keywords; 212 keywords occurred with a frequency of 10 or higher. Those with a frequency of 28 or higher (representing at least 0.8% of the total vocabulary) were compiled. The list was "cleaned" to remove non-words (e.g., "www"). MDS scaling produced a plot reproduced here in Figure 3.

The largest core region indicated is that in the center (home, health, people, etc.) and hospital nursing service, and care-taking. These core regions show terms that are frequently used and that co-occur in close proximity. Notice the emotional cues: "thank you," "safe," "great." On the border of the core is a cluster having to do with COVID it-

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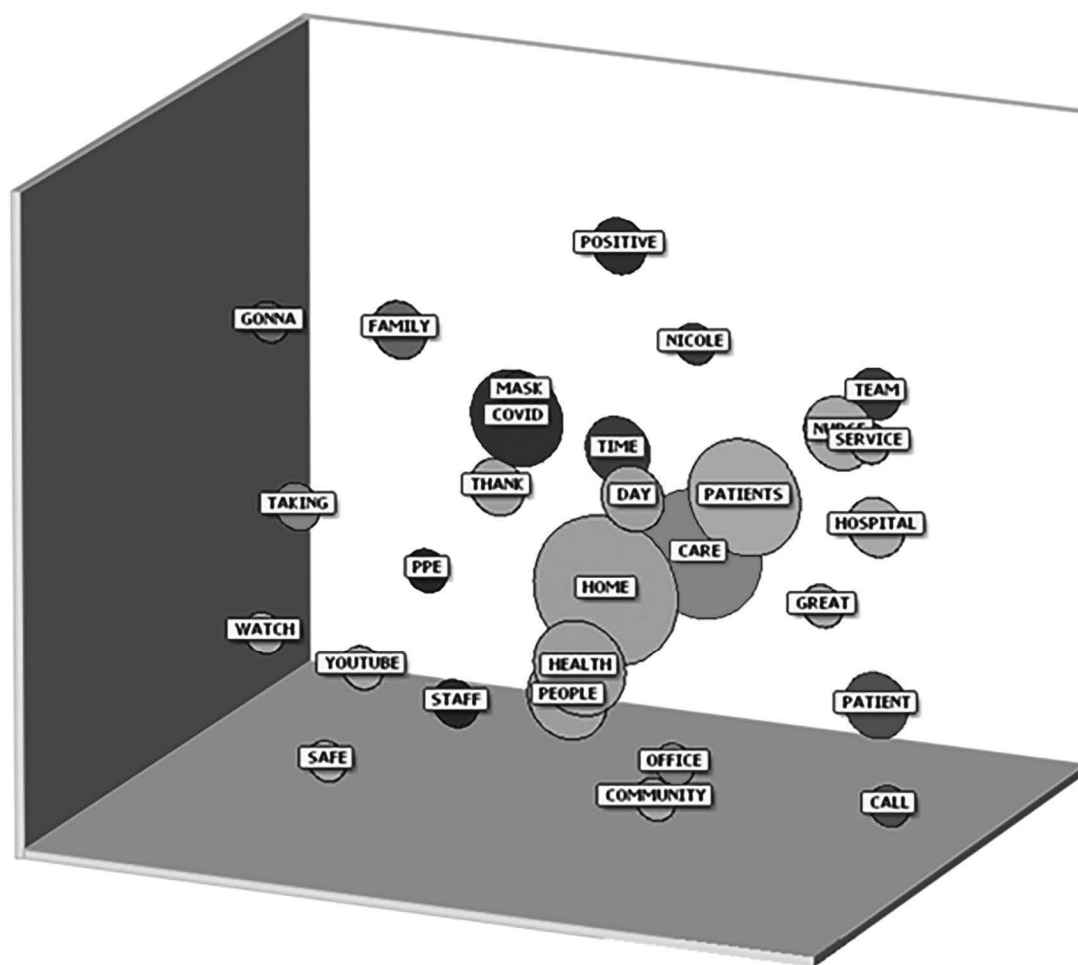
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Figure 3. MDS plot of most frequently occurring keywords (stress = .251 R^2 = 0.6456) (Milonas et al. 2020, 54).

self and PPE, obviously a critical concern for home health nursing.

A second analysis of two-to-five word phrases was similarly undertaken. There were over 11,000 such phrases; 375 occurred 3 times or more. For the MDS plot, we used those that occurred 10 times or more (Figure 4).

The core region here points to the front line of home health nurses, with a secondary region pointing to registered nurses caring specifically for COVID patients. A third region clusters around the role of visiting nurse services.

As a result of the co-word analysis, we mapped twenty new terms to the CT-NIB taxonomy. Figure 5 shows the new terms.

These mapped to phenomena in the five CT-NIB facets: action, care, resources, agents and processes. Terms that did not map, and thus pointed to a shift in the working taxonomy, were "COVID," "COVID-positive," "mask," "PPE," "Protective Equipment" and "front lines." These were elements that resulted from variations in the PES, in order to protect patients, other members of the communities and families, as well as the homecare nurses themselves.

3.2 Open Coding of Transcripts

Two independent rounds of open coding then ensued. The first round was conducted using QDA Miner, and produced the clustered code list shown in Figure 6.

The second round was conducted by a different team member using a simple spreadsheet methodology; a frequency distribution of the codes from this round is reproduced in Figure 7.

Results of the two rounds of open coding, when compared, revealed a "rich panoply of emergent vocabulary" (Smiraglia et al. 2021, 10) including, not surprisingly, emotional cues such as "ambiguity, anxiety, fear ... hope, commitment, determination" and even "moral fiber." Similar results were seen in a study that analyzed Twitter tweets in France during the same COVID time period (Tanti and Moquet 2022). Home health nursing has remained a highly information-dependent discipline during the pandemic. Nevertheless, it seems clear the addition to the core taxonomy of this emotive layer combined with pandemic-specific nursing practices suggests certain shifts, cultural and other-
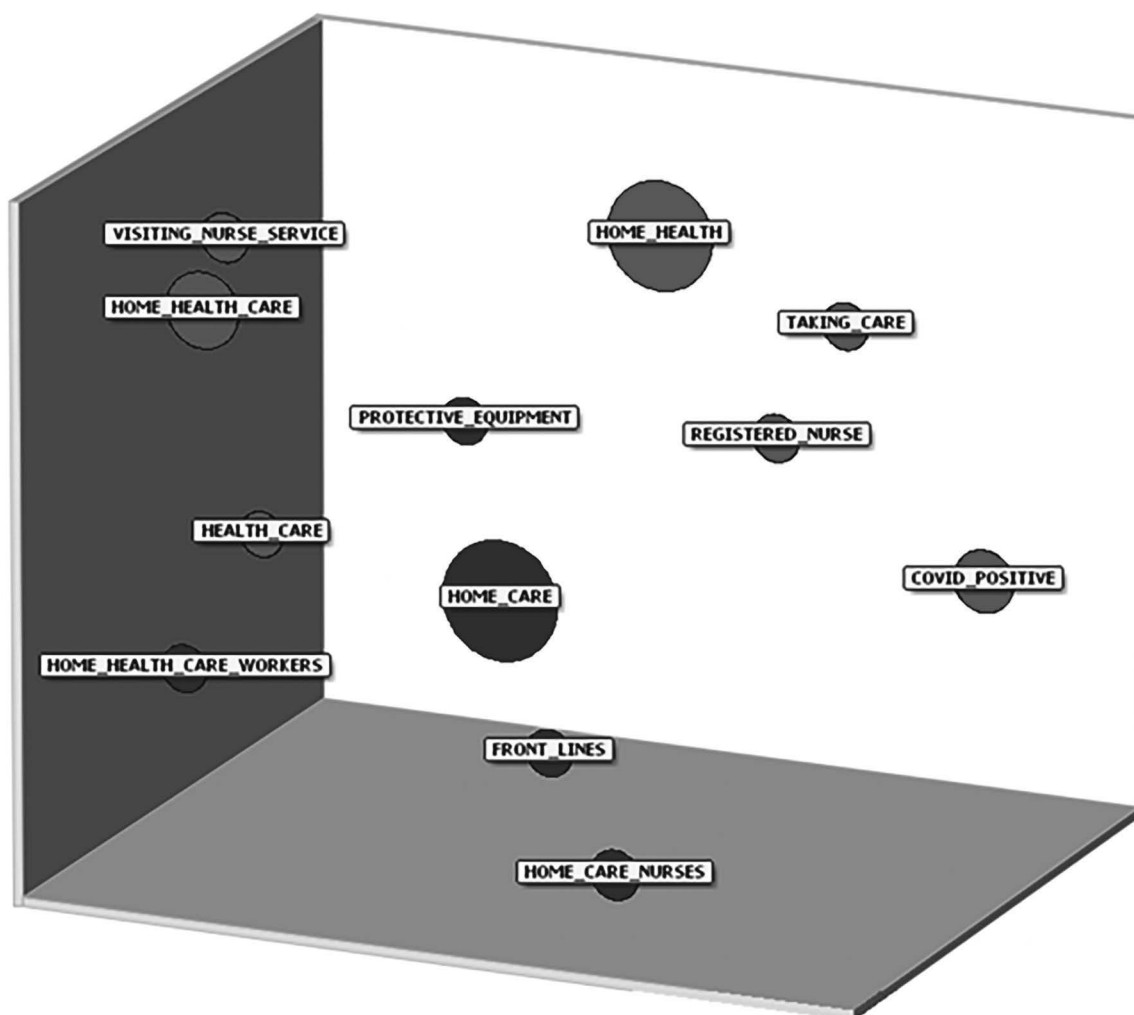
Figure 4. 3D MDS plot of most frequently occurring phrases (stress = .1723 R² = .9351) (Milonas et al. 2020, 54).

wise, in NIB. As we pointed out in Smiraglia et al. (2021) the significance of this research lies in the "intertwining" of knowledge organization (KO) and NIB—two disciplines creating a synergistic effect to not only describe the effect of the pandemic but also to advance the knowledge base of home health nursing. This synergy has been addressed by Pajarillo (2020) and in the description of the PES with varying components that influence the NIB of homecare nurses. The emotional descriptors were a result of the adoptive behaviors that nurses embraced in response to the unstable, uncertain, and changing PES.

3.3 Patients, Pandemic, Community: Axes for Taxonomic Extension

Narrative analysis was based on axial coding of our data (axes were first identified in Smiraglia et al. 2022). We merged the codes from the two rounds of open coding to create a set of categories that could be used as axes for a nar-

rative analysis. These categories likewise appear prominently in the NIB taxonomy.

Pandemic
Home
Patients
Communities
Safe
Nurses and Nursing
Emotion
COVID
PPE
Healthcare

Our analysis was constructed using contextual quotations from the video transcripts, which were easily located in Word-Stat using the KWIC (keyword in context) feature. Many of these reveal the synergistic shifting of KO and NIB (particularly with the unstable PES influencing homecare nurses).

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Phenomena	Facets	Subfacets
care nurses	agents	staff
discovery	care	information
health care	resources	domain
home care	care	patient care
home care experience	actions	behavior
home care nurses	agents	staff
home care nursing	resources	domain
home visits	care	patient care
information conduits	agents	influencers
information searching	processes	processes
information sources	resources	resource
information tools	resources	tool
nursing care	care	patient care
patient care	care	patient care
patient interaction	actions	interaction
patient logs	care	information
perception of personal and family	actions	behavior
personal and family	agents	patient
professional nursing	resources	domain
sense	actions	behavior
treatment	care	treatment

Figure 5. New terms mapped to CT-NIB Taxonomy
(Smiraglia et al. 2020, 55)

A report from News Center Maine (April 1, 2020) points to "pandemic": [2]

> So we all know nurses and doctors have been doing incredibly important work on the front lines of the coronavirus *pandemic* every single day but healthcare heroes don't always work in hospitals ... home health care workers are speaking up about the work that they're doing.

Similarly, a news report from KTIV television in Sioux City, Iowa (April 16, 2020) shows the importance of "home" care[3]

> *Health* care workers are right on the front line to the COVID-19 pandemic ... many still venture into people's *homes* to get patients the treatment they need.

"Patients" are the focus of a report about home health nurses' duties from the Worcester Mass. *Telegram & Gazette* (May 11, 2020) [4]

> They are screening people for COVID-19 and treating symptoms from the comfort and safety of *pa-

tient's* homes keeping them out of the hospital as cases surge.

A "float" nurse (a covering or replacement nurse for those who regularly cover a particular community setting) from Lenox Hill Hospital in New York (March 27, 2020) anchors her work in "community" [5]

> The *community* [is] very supportive and [it] never felt like I've been without support or help and it makes me feel like I'm in a part of a *community.*

"Safety" is a priority (Fox 8 WGHP High Point, North Carolina May 19, 2020) [6]

> Making sure that we have the proper protective personal equipment for them, making sure that they are informed, making sure that they feel *safe*, making sure that also we educate our clients so that our clients feel *safe* with the nurses coming in and out of their homes.

Continuing to face patients and the public amidst an airborne virus is described by a nurse from the Visiting Nurse Service of New York (May 19, 2020): [7]

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Pandemic
- mitigation
- transmission
- epidemiology
- outbreaks
- vaccine
- isolated
- challenging times
- frontline workers
- social distancing
- heroes
- crisis
- a pandemic
- emotional toll
- quarantine
- change
- risk
- exhausted
- community
- psychological
- emotional

emotion
- vanquish
- confusing
- careful
- anxiety
- fear
- dedicated
- committed
- anxious
- nervous
- ridiculous
- stress
- rattling
- safe
- decompress
- hope

COVID
- COVID-19
- positive
- deconditoned
- weak
- tired
- oxygen
- walkers
- disease process
- recovery process
- incubation period
- corona viruses
- droplet transmission

PPE
- masks
- gloves
- face shields
- goggles
- hazmat suits
- Personal Protective Equipment
- unconventional strategies
- shortages
- gowns

nursing
- nurse
- home care
- home nurses
- home health agency

- precaution
- education
- visiting nurses
- screening
- positive spirit
- informed
- educating
- problem solvers

New York
- Visiting Nurse Service

Health Care
- telehealth
- hospice
- provider

patients
- vulnerable
- recovery
- self isolate

infrastructure
- public transportation

hospitals
- overwhelmed
- converted floors
- ICU beds

Philadelphia
- Bayada Home Health Care
- Philadelphia Home Health Team
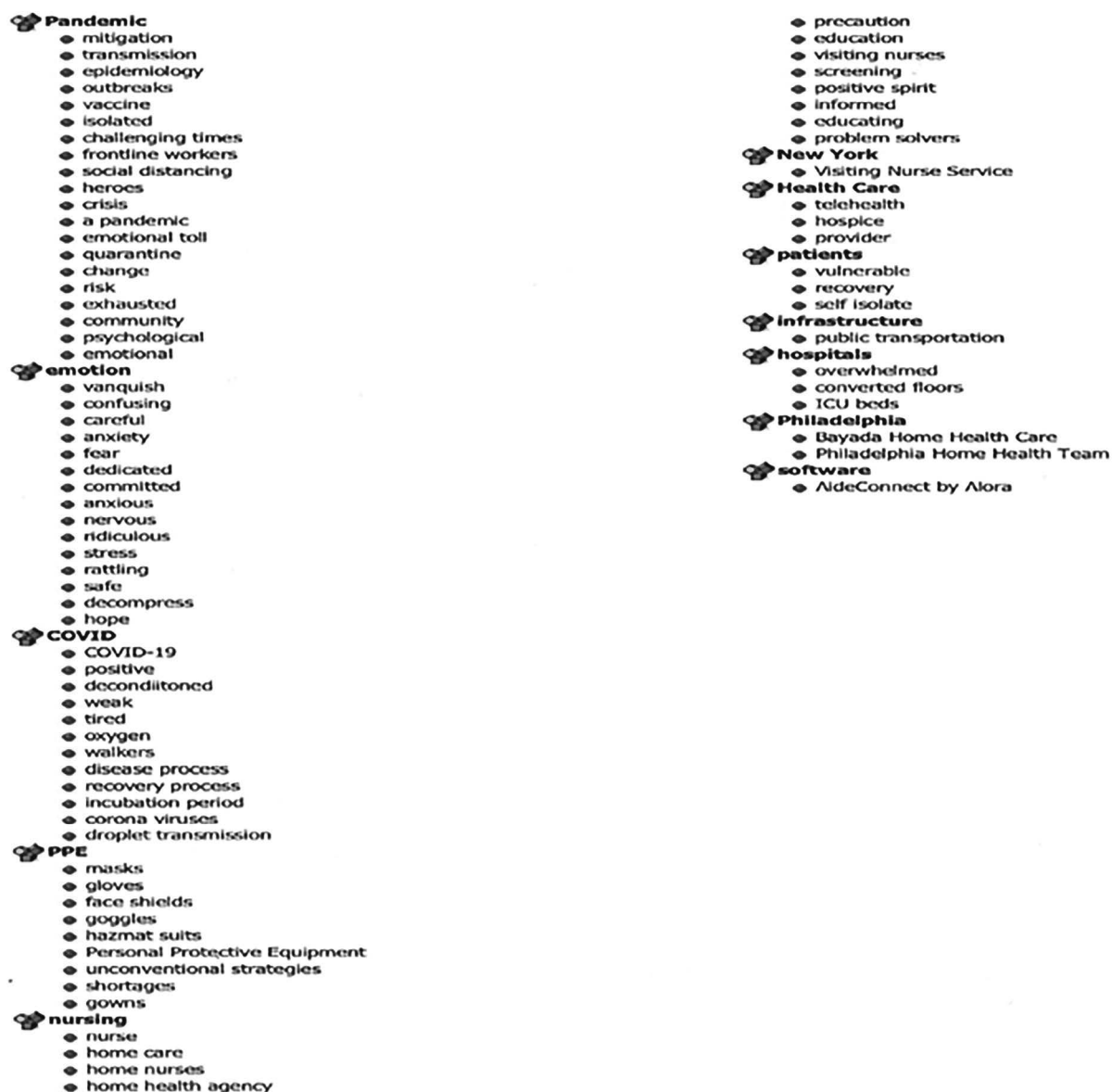
software
- AideConnect by Alora

Figure 6. Open coding using QDA Miner (Smiraglia et al. 2021).

Now we continue to see *nurses* on the frontlines at hospitals and now we're hearing from two [home health nurses] who go into homes every day to care for COVID-19 patients.

Both nurses and patients experience a mix of "emotions." Here is a nursing supervisor from Wallingford (Conn.) Home Health Care (April 14, 2020): [8]

[it] has been amazing coming to those drive-through parades handing out the little treats ... it's all those little things that have really made the difference ... the *emotional* support being there for our patients is critical.

Personal Protective Equipment "PPE" has been critical from the outset. Here is a Bayada Home Health Care nurse from Wilmington, Del.: [9]

they come out and deliver supplies straight to our cars like a drive through and it's really been helpful during this because we feel... You know we're alone anyway really when we provide care, which is part of the reason I love this job ... they've been really wonderful about making sure that we have all of the bags, the *PPE*, extra pens because you have to leave your pen there, you know?.

Code	Frequency	Code	Frequency	Code	Frequency
pandemic	14	doctors	5	emotionally	3
home	13	registered nurse	5	families	3
patients	12	clinicians	4	front line	3
communities	10	COVID	4	help	3
safe	10	Covid 19	4	home care workers	3
nurses	9	family	4	home visits	3
hospice	8	fearful	4	Homecare	3
hospital	8	gloves	4	masks	3
healthcare	7	home health	4	nurse	3
home care	6	Home Health Care	4	quarantined	3
PPE	6	nursing homes	4	risk	3
protective equipment	6	precautions	4	sick	3
rewarding	6	coronavirus pandemic	3	surgical masks	3
virus	6	discharged	3	symptoms	3
care	5	disease	3	visiting nurses	3
coronavirus	5	education	3		

Figure 7. Open coding using spreadsheet method; codes with frequency ≥3 (Smiraglia et al. 2021).

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The importance of PPE is reiterated by ABC 7 New York (April 16, 2020): [10]

> For hospital workers, *PPE* shortages are of concern but it's also a big concern for nurses and therapists working inside the homes of patients.

3.4 Thematic Analysis of Text of News Videos

A separate study involving focus group interviews of home health nurses during the pandemic resulted in overarching and recurring themes (Pajarillo 2023) (details of this study shall be presented in a future publication). In the thematic analysis of the video transcripts of news items during the height of the pandemic in 2020, three region points were noted. Smiraglia et al. (2020, 54) found "the core region points to the front line of home health care workers, a proximate second region points to registered nurses taking care of COVID-positive clients. The third region points to the role of visiting nurse services." In the focus groups, the overarching and recurring themes had clearly changed. It appeared that "there is now a different kind of home health nursing landscape." Out of this came three cluster themes: (1) patients still come first; (2) the nurse can never expect what to see upon visiting a homebound patient or who else might have COVID in the home setting; and (3) adapting one's care in the mindset of COVID.

The home health nursing landscape has indeed changed with the persistence of COVID even as we observe decreased positivity, hospitalization and death rates (Centers for Disease Control and Prevention 2023). Comparing the top three core region points extracted by Smiraglia et al. (2020) from the taxonomy analysis of the study by Pajarillo (2008), the cluster themes seemed to be about the same. What changed was the emphasis and the ordering of the region points. The 2020 study came up with the following order: healthcare workers in the frontline, registered nurses caring for COVID patients, and the role of visiting home health nurses. These three regions relate to the nurses, i.e., nurses in the frontline who provide care to patients with COVID as one of many essential roles as visiting home health nurses. Note also that these were consequential to the unstable, uncertain and COVID-19 infested PES that the overarching themes were the homecare nurses working in the front lines, their essential role in the midst of COVID, and caring for their patients in their respective homes.

The cluster themes are not any different from the core region points, with very little change in focus and order. Patients have always been the reason for having nurses. Having patients as the first priority in the cluster theme makes perfect sense. The other two cluster themes relate to home health nurses and their roles. In the preliminary thematic analysis (Smiraglia et al. 2020), COVID dominated and dic-

tated the roles of home health nurses. Nurses adapted their practice to the presence of COVID, not knowing what to expect and who they might encounter who might have COVID. Super extra precautions were made by the nurses as demonstrated by donning their protective gear as they entered the patient's home, doing the interviews over the phone either before or after the home visit, minimizing the presence of many relatives and friends when nurses visited, etc. From these adopted NIB behaviors, it was inevitable that nurses might experience a range of emotions from fear, safety, duty, uncertainty, etc.

4.0 Limitations: Dealing with Emotion

"We see what interests us; we look with a purpose" (Pirie 1996, 3). The main reason for selecting newscasts was their relevance to the topic of the research. Technically, given the vast number of videos available on YouTube, our qualitatively-structured sample might be considered "small," which could be considered a limitation of this study. On the other hand, an attempt to analyze thousands of newscasts available on YouTube would not be feasible under any conditions. We are confident that at the time of the search we gathered the most informative qualitative data set available.

Another inherent limitation of working with YouTube newscasts was that a video could be removed and no longer available for data verification (Berger 2012). Margaret Mead, who strongly supported the use of video records in anthropological studies, acknowledged the presence of inevitable subjectivity in the process of producing video artifacts. Because of the importance of their role, video creators could infuse these products with their own "culturally biased viewpoints" (Mead 1975, 8). Regardless of whether any of the aforementioned shortcomings stood a chance of materializing, employing this study's methodological framework provided the means to minimize the potential effect of these limitations on the research findings.

In the current study, we have looked at the work of home health nurses during a pandemic. Our analysis highlighted the role of emotions experienced by professional caregivers while performing their job set in their PES. Home health nurses were at high risk for contracting COVID-19. They expressed feelings of emotional exhaustion associated with empathy and compassion for their patients, physical fatigue due to increased workloads, and concerns about personal safety and well-being of their family members. Repertoire of verbal expressions communicated in video-recorded narratives included terms describing participants' perception of events that created high levels of uncertainty and stress, and their accounts of personal experiences from being professionally involved with the day-to-day lives of people affected by the pandemic. The analysis of these data generated a group of terms describing emotions.

There are many different approaches to analyzing emotionally-laden language and emotions. A discourse on this subject matter lies outside the scope of this article; suffice it to say that selected were "emotion words" and "emotion-laden words." The first phrase "refer[s] to particular affective states ("happy," "angry") or processes ("to worry," "to rage"), and function to either describe ("she is sad") or express them ("I feel sad")." The second phrase "express[es] ("jerk," loser") or elicit[s] emotions from the interlocutors ("cancer," malignancy")" (Pavlenko 2008, 148). The selected terms were assigned to quasi-taxonomic groups for further analysis. Thus we had basic human emotions grouped under the concept of "emotion." The terms in this group described affective states and emotional processes experienced by the participants as homecare nurses' NIB were affected by their PES. Other groups contained emotion-laden terms referencing the external dimensions of nurses' reality. For instance, the term "vulnerable" was assigned to the taxonomic grouping of "patients" while "positive spirit" was mapped under the concept of "nursing." With this approach, the scope and scale of information about the nursing process, information behavior and the social impact of the pandemic did not create skewed assumptions that privilege one set of knowledge units over others.

5.0 Conclusions

5.1 Notes on Taxonomic Impact

Without a doubt our analysis of news videos and focus group interviews shows the dramatic impact of the COVID pandemic on nursing and home care. Chan et al. (2021) arrive at parallel conclusions concerning the adverse effects of the pandemic on all nursing:

> Burnout, Exhaustion and Moral Injury
> Furloughs, layoffs and leaving the professions
> Substance use disorders and diversion
> Deaths and Illnesses
> Social determinants of health affecting the nurse force

The importance of this research for knowledge organization is the understanding we develop concerning shifting taxonomies in the NIB model as influenced by the prevailing environment or PES. We see, of course, new terms describing the pandemic and nursing practices enter the vocabulary. But we also see new usages including terms describing community and emotional responses. The challenge for taxonomy evolution is to track how these terms evolve once they enter usage in the community. This, of course, will come only with time.

Our research suggests new terminology should be added provisionally to the CT-NIB taxonomy for the duration of the pandemic, with repeated research and analysis over time to meet the challenge of evolving terminology. Implications to nursing and nursing information behavior are likewise important to highlight as the pandemic continues, and results of intermittent research on their taxonomic evolution will inform the adaptations that home health nurses need to integrate into practice.

5.2 Conclusions and Recommendations

This research demonstrated the effective use of the CT-NIB to ascertain a paradigm shift in knowledge organization in home health nursing during the pandemic. Using domain analytical methods, including CWA applied to an ethically constructed set of video reports by working home care nurses, we successfully followed subtle shifts in the NIB process that could be reflected in the evolving CT-NIB taxonomy. The extenuating circumstances of a global pandemic dictated the structure of the methods we could apply. But the results demonstrated the efficacy of periodic evaluation of working knowledge organization systems. In this case, factors that affect the PES, either circumstantial or permanent, can influence the factors and processes involved in NIB. This can potentially affect the structure and outcomes of nursing care, which in turn is reflected in the taxonomy. This is an example of the synchrony of a knowledge organization system and the domain it reflects as, even in a pandemic, the system and the domain can be used mutually and reflectively to track evolution in core knowledge.

Endnotes

1. In this manuscript, the term "home health nursing" refers to the specialization of nursing that provides care to patients in their home residence. This precludes those who live in nursing homes, assisted living, rehabilitation units or other similar institutional settings. Homecare nursing refers to the therapeutic nursing interventions administered in patients' home residences by homecare nurses. Homecare (one word) is an adjective used to describe the noun, e.g., "homecare nurses" are nurses practicing home health nursing, "homecare visits" refer to home visits where care is provided by nurses in patients' home residences. Home care (two words) refers to care delivered in the patients' home residence.

2. News Center Maine. "Home Health Care Amidst COVID-19." April 21, 2020. Video. https://youtu.be/c8vlUDkr4cg††

3. KTIV. "Health Care Workers Still Providing Care at Home During Covid-19 Pandemic." April 16, 2020. https://ktiv.com/2020/04/16/health-care-workers-still-providing-care-at-home-during-covid-19-pandemic/

4. Pike-Benton, Jane. "As I See It: Supporting Home Care, Hospice Heroes Leading us through COVID-19." *Telegram & Gazette.* May 11, 2020. https://www.telegram.com/news/20200511/as-i-see-it-supporting-home-care-hospice-heroes-leading-us-through-COVID-19

5. "Front Line Nurses in COVID-19 Pandemic Find Solace in 'Hope Huddles.'" March 27, 2020. Video. https://www.youtube.com/watch?v=Bt8ZboddcB4

6. "Growing Demand for Home Health Care Workers During Coronavirus Pandemic." May 19, 2020. Video. https://www.youtube.com/watch?v=BXRW_2qhJpE

7. Visiting Nurse Service of New York Home Care. "Home Health Care Heroes Providing Care to New Yorkers with COVID-19." April 16. 2020. Video. https://youtu.be/76dXN3wiqr0††

8. Masonicare. "Being a Home Health Nurse during COVID-19" June 19, 2020. Healthcare Heroes Episode 4. Video. https://www.youtube.com/watch?v=eY7ff1lQuzY

9. Bayada Home Health Care. "COVID-19 Home Front Hero." April 14, 2020. Video. https://www.youtube.com/watch?v=_vTORfKNGzA

10. Krauth, Dan. "Coronavirus NJ: Home Nurse Says She Quit after Fighting for PPE." April 27, 2020. Video, ABC7 NY. https://abc7ny.com/7-on-your-side-investigates-home-health-aide-nurse-coronavirus-nj/6132455/

References

Berger, Israel. 2012. "YouTube as a Source of Data." *PsyPAG Quarterly* 1, no.83:9-12. https://doi.org/10.53841/bpspag.2012.1.83.9

Centers for Disease Control and Prevention. 2023. COVID data tracker. https://covid.cdc.gov/covid-data-tracker/#datatracker-home.

Chan, Garret K., Jana R. Bitton, Richard L. Allgeyer, Deborah Elliott, Laura R. Hudson, and Patricia Moulton Burwell. 2021. "The Impact of COVID-19 on the Nursing Workforce: A National Overview." *OJIN: The Online Journal of Issues in Nursing* 26, no. 2. https://doi.org/10.3912/OJIN.Vol26No02Man02

Mead, Margaret. 1975. "Visual Anthropology in a Discipline of Words." In *Principles of Visual Anthropology*, edited by Paul Hockings. Mouton: The Hague, Paris, 3-10.

Milonas, Elizabeth, Sergey Zherebchevsky, and Richard P. Smiraglia. 2020. "CT-NIB Taxonomy for Nursing Information Behavior: KO in the Pandemic." *IKOS Bulletin* 2, no. 2: 13-17.

Milonas, Elizabeth, Edmund J.Y. Pajarillo, Richard P. Smiraglia and Sergey Zherebchevsky. 2022. "Taxonomies in Home Health Nursing Information Behavior: The Impact of Information in an Historic Time of Pandemic." *IKOS Bulletin* 4, no.2:46-53.

Naikar Neelam. 2017. "Cognitive Work Analysis: An Influential Legacy Extending Beyond Human Factors and Engineering." *Applied Ergonomics* 59, Part B: 528-540. https://doi.org/10.1016/j.apergo.2016.06.001

Pajarillo, Edmund J.Y. 2005. "Contextual Perspectives of Information for Home Care Nurses: Towards a Framework of Nursing Information Behavior (NIB)." PhD diss., Long Island University.

Pajarillo, Edmund J. Y. 2008. *A Conceptual Model of Nursing Information Behavior (NIB)*. Saarbrücken, Germany: VDM Verlag Dr. Müller Aktiengesellschaft & Co.

Pajarillo, Edmund J.Y. 2020a. "Nurses' Use of Data and Information to Deliver Safe and Quality Patient Care in the Context of Nursing Information Behavior". *IKOS Bulletin 2*, no.2: 22-27. https://journals.library.ualberta.ca/ojs.cais-acsi.ca/index.php/cais-asci/article/view/238/200

Pajarillo, Edmund J.Y. 2020b. "Knowledge Discovery and Development as an Ongoing Process in the Use of Data and Information by Nurses to Deliver Safe and Quality Care." *IKOS Bulletin* 2: 59-64.

Pajarillo, Edmund J.Y. 2023. "Focus Group Interviews of Home Care Nurses." Unpublished manuscript.

Pavlenko, Aneta. 2008. "Bilingualism: Language and Cognition." *Cambridge University Press*, vol. 11, no.2: 147-164. https://doi.org/10.1017/S1366728908003283

Pirie, Susan E. B. 1996. "Classroom Video-Recording: When, Why and How Does It Offer a Valuable Data Source for Qualitative Research?" Paper presented at the Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, October 14, 1996. ERIC ED401128

Rapaport, William. 2003. "What is the 'Context' for Contextual Vocabulary Acquisition?" In *Proceedings of the 4th International Conference on Cognitive Science/7th Australasian Society for Cognitive Science Conference (ICCS/ASCS-2003), 13-17 July, Sydney,* Australia*, 2003,* edited by Peter Slezak. Sydney: University of New South Wales, 1: 547-552.

Singh, Jaspreet and Jagandeep Singh. 2020. "Covid-19 and its Impact on Society." *Electronic Research Journal of Social Sciences and Humanities* 2, no. 1. https://ssrn.com/abstract=3567837

Smiraglia, Richard P. 2015. *Domain Analysis for Knowledge Organization: Tools for Ontology Extraction*. Chandos Information Professional Series. Oxford: Elsevier/Chandos.

Smiraglia, Richard P., Edmund Pajarillo, Elizabeth Milonas, and Sergey Zherebchevsky. 2020. "Home Health Care Nursing in the Pandemic: Preliminary Analysis of Video Interviews." *IKOS Bulletin* 2, no. 3: 52-55.

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E. J. Y. Pajarillo, E. Milonas, S. Zherebchevsky, R. P. Smiraglia. Home Health Nursing Information Behavior ...

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Smiraglia, Richard P., Elizabeth Milonas, Sergey Zhereb-chevsky, and Edmund Pajarillo. 2021. "Nursing Information Behavior (NIB) in the Pandemic: Resilience of a Knowledge Base." In *Proceedings from North American Symposium on Knowledge Organization*, Vol. 8. DOI: https://doi.org/10.7152/nasko.v8i1.15885

Smiraglia, Richard P., Edmund Pajarillo, Elizabeth Milonas, and Sergey Zherebchevsky. 2022. "Shifting Taxonomies in Home Case Nursing Information Behavior: Patients, Pandemic, Community." *IKOS Bulletin* 3, no. 1: 1-2.

Tanti, Marc and Hugo Moquet. "Identification of the Actors Involved in COVID-19 Discussions on Twitter at the Beginning of the Epidemic: A Study of Rumors and Tweets Posted." In *Knowledge Organization across Disciplines, Domains, Services and Technologies: Proceedings of the Seventeenth International ISKO Conference, 6-8 July, 2022, Aalborg,* Denmark, edited by Marianne Lykke, Tanja Svarre, David Haynes, Mette Skov, Martin Thellefsen, and Daniel MartÍnez-Ávila. Advances in Knowledge Organization 19. Baden-Baden: Ergon, 353-356.

Appendix 1. Videos Included in the Analysis

Video Title	Links	Date	Source
Coronavirus Resources for Home Care & Hospice	https://homecarenh.org/covid19/	2/28/20	organization webpage
Home Health Care Adapting During COVID-19	https://www.youtube.com/watch?v=XEDP_crFjYA	4/25/20	YouTube
Episode 16 | COVID-19 Home Front Hero	https://www.youtube.com/watch?v=_vTORfKNGzA	4/14/20	YouTube
How COVID-19 Affects Home Health Aides and Visiting Nurses	https://www.youtube.com/watch?v=AuQzMkiFMhU	3/24/20	YouTube
Home Health Care Companies Adjust for Coronavirus	https://www.youtube.com/watch?v=brjCs2PyUss	3/25/20	YouTube
Home Health Care Heroes Providing Care to New Yorkers with COVID-19	https://www.youtube.com/watch?v=76dXN3wiqr0	4/16/20	YouTube
Episode 4 | Caring for COVID-19 Clients	https://www.youtube.com/watch?v=74tCwrm0LtY	3/37/20	YouTube
Coronavirus: It Could Come Back in the Fall if We Don't Have a Vaccine, Dr. Scott Gottlieb Says	https://www.youtube.com/watch?v=it0OeLZT9jw	4/14/20	YouTube
Home Health Aide – Homecare Aide Software – AideConnect by Alora	https://www.alorahealth.com/home-health-software-covid-19/	no date	organization webpage
Home Health Care Amidst COVID-19	https://www.youtube.com/watch?v=c8vlUDkr4cg	4/21/2020	YouTube
COVID-19: Visiting Nurse and Hospice for VT & NH is Here for You	https://www.youtube.com/watch?time_continue=75&v=1V7SRjIsApg&feature=emb_logo	4/17/2020	YouTube
Coronavirus NJ: Home Care Heroes	https://www.app.com/story/news/health/2020/04/14/vna-covid-home-care-nurses-coronavirus-patients/2960746001/	4/14/2020	organization webpage
Home Health Care Workers for Those With Special Needs Face Big Challenges With COVID-19	https://chicago.cbslocal.com/2020/04/09/home-health-care-workers-for-those-with-special-needs-face-big-challenges-with-covid-19/	4/9/2020	organization webpage
WNBC-TV: VNSNY on the Front Lines of Fighting COVID-19	https://www.vnsny.org/coronavirus-covid-19/vnsny-covid-19-in-the-news/wnbc-tv-vnsny-on-the-front-lines-of-fighting-covid-19/	no date	organization webpage
Health Care Workers Still Providing Care at Home During COVID-19 Pandemic	https://ktiv.com/2020/04/16/health-care-workers-still-providing-care-at-home-during-covid-19-pandemic/	4/16/2020	organization webpage
Nurses Expand Care for Home Health Patients Amid Coronavirus	https://www.youtube.com/watch?v=1xU4_i1ujps	3/24/2020	YouTube

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Video Title	Links	Date	Source
Home Health Care is New Front in Virus Fight	https://www.battlecreekenquirer.com/story/news/2020/05/08/home-care-heroes-nurses-aides-carry-amid-virus-outbreak/3032081001/	5/8/2020	organization webpage
Growing Demand for Home Health Care Workers During Coronavirus Pandemic	https://www.youtube.com/watch?v=BXRW_2qhJpE	5/29/2020	YouTube
Nurses who Go into Homes to Care for COVID-19 Patients	https://www.youtube.com/watch?v=ZaIaC9N6eI8	4/16/2020	YouTube
As Florida Struggles to Contain Coronavirus, Home Health-Care Workers Face New Risks	https://www.youtube.com/watch?v=iqguvMdBlko	3/30/2020	YouTube
Healthcare Heroes Episode 4- "Being a Home Health Nurse during COVID-19"	https://www.youtube.com/watch?v=eY7ff1lQuzY	6/19/2020	YouTube
What Life is Like For Healthcare Workers During the COVID-19 Pandemic	https://www.youtube.com/watch?v=g64z0eAapYE	4/15/2020	YouTube
Front Line Nurses in COVID-19 Pandemic Find Solace in 'Hope Huddles'	https://www.youtube.com/watch?v=Bt8ZboddcB4	3/27/2020	YouTube
What It's Like to be a Home Care Nurse	https://www.youtube.com/watch?v=MPXJj20suCg	1/19/2020	YouTube
Home Health Nurses Need to be Problem Solvers	https://www.youtube.com/watch?v=j_YKmV82yCk	11/9/2011	YouTube
Registered Nurse, Home Care	https://www.youtube.com/watch?v=wUMN0kBHtoE	3/15/2016	YouTube
What is Home Care?	https://www.youtube.com/watch?v=HvAa45mCHGQ	11/6/2018	YouTube
Home Health-Care Workers in US at Tipping Point Amid Coronavirus Outbreak	https://www.cnbc.com/2020/04/14/home-health-care-workers-at-tipping-point-amid-coronavirus-outbreak.html	4/14/2020	organization webpage
Home Health and COVID-19	https://www.youtube.com/watch?v=K9x8pgl2U04	5/6/2020	YouTube
Home Health Care Adapting During COVID-19	https://youtu.be/XEDP_crFjYA	4/25/2020	YouTube
Home Health Care Heroes Providing Care to New Yorkers with COVID-19	https://youtu.be/76dXN3wiqr0	4/26/2020	YouTube
How COVID-19 Affects Home Health Aides and Visiting Nurses	https://youtu.be/AuQzMkiFMhU	3/24/2020	YouTube
Home Health Care Amidst COVID-19	https://youtu.be/c8vlUDkr4cg	4/21/2020	YouTube
Pediatric Home Care Nurse	https://youtu.be/iqguvMdBlko	5/20/2020	YouTube
Home Health Care is New Front in Virus Fight	https://youtu.be/k39IXA44yeo	4/27/2020	YouTube
Home nurse says she quit after fighting for PPE	https://abc7ny.com/7-on-your-side-investigates-home-health-aide-nurse-coronavirus-nj/6132455/	4/27/2020	organization webpage
Home Care Nurses Admit Emotional Toll on Them has been High During Coronavirus Pandemic	https://newyork.cbslocal.com/2020/05/10/coronavirus-COVID-19-home-care-nurses-national-nurses-month/	5/10/2020	organization webpage
Home Care Nurses on the Front Lines	https://madison.com/ott/partners/madison_com/COVID-19-home-care-nurses-on-the-front-lines/video_7340a965-1623-5a8f-96cb-35f7b59b5ce3.html	5/20/2020	organization webpage
'In Harm's Way': Home ç on the Frontline Against COVID-19	https://www.witf.org/2020/03/26/in-harms-way-home-care-workers-on-the-frontline-against-COVID-19/	3/26/2020	organization webpage

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Video Title	Links	Date	Source
Pandemic Heroes: Home Health Care Nurses, Workers	https://www.keyc.com/2020/04/28/pandemic-heroes-home-health-care-nurses-workers/	4/28/2020	organization webpage
Nurses Expand Care for Home Health Patients Amid Coronavirus	https://youtu.be/1xU4_i1ujps	3/24/2020	YouTube
As I See It: Supporting Home Care, Hospice Heroes Leading us Through COVID-19	https://www.telegram.com/news/20200511/as-i-see-it-supporting-home-care-hospice-heroes-leading-us-through-COVID-19	5/11/2020	organization webpage