
Original Article

The Changing Job of School Nurses during the COVID-19 Pandemic: A Media Content Analysis of Contributions to Stress

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Abstract

School nurses and unlicensed assistive personnel (UAPs) are essential to the health and wellness of school children. However, most US schools do not have a full-time licensed nurse. During the COVID-19 pandemic, school nurses and UAPs have been integral in ensuring that the health needs of students were met. They have seen a marked increase in their responsibilities included implementing COVID-19 mitigation strategies, screening for symptoms, testing students and staff, conducting contact tracing and data collection, and ensuring the implementation of rapidly changing COVID-19 guidelines and protocols for schools. The objective of this study was to explore COVID-19 occupational changes and their contributions to stress among school nurses and UAPs through a content analysis of local and national media articles. A Google search of articles published between February 2020 and September 2021 was conducted using the following search terms: ‘school nurse’, ‘COVID-19’, ‘health aide’, ‘stress’, and ‘experiences’. A search was also conducted in Nexis Uni. Articles were included if the topic discussed school nurses or UAPs and COVID-19. All articles that examined nurses in other settings were excluded from the review. We examined topics and themes temporally (from February 2020 to September 2021) and spatially (i.e. the frequency by US state). Overall, 496 media articles discussing school nurses and COVID-19 were included in our review. The highest volume of articles was from September 2021 (22%, 111/496). Other months with relatively high volume of articles included August 2020 (9%, 43/496), January 2021 (10%, 47/496), February 2021 (9%, 44/496), and August 2021 (8%, 39/496). These larger article volumes coincided with notable COVID-19 events, including returning to school in the fall (August 2020 and August 2021), school nurses assisting with vaccine rollouts among adults in the USA (January/February 2021), concerns regarding the delta variant (August/September 2021), and vaccine rollouts for children ages 12–15 (September 2021). The representation of articles spatially (national, state, regional, or local) was 66 (13%) articles at

national level, 217 (44%) state level, 25 (5%) regional level, and 188 (38%) local news at the city and/or village level. Pennsylvania had the highest frequency of articles, but when standardized to the state population, Alaska had the highest rate of media per 100 000 people. Three major themes were identified in our analysis: (i) safety; (ii) pandemic-related fatigue/stress; and (iii) nursing shortage/budget. The most represented theme for articles before September 2021 was that of safety. Over time, the themes of pandemic-related fatigue/stress and nursing shortage/budget increased with the most notable increase being in September 2021. The COVID-19 pandemic has resulted in new occupational risks, burdens, and stressors experienced by school nurses and UAPs. School nurses play a critical role in disease surveillance, disaster preparedness, wellness and chronic disease prevention interventions, immunizations, mental health screening, and chronic disease education. Furthermore, they provide a safety net for our most vulnerable children. Given that school nurses were already over-burdened and under-resourced prior to the pandemic, characterization of these new burdens and stressors will inform emergency preparedness resources for school health personnel during future pandemics or outbreaks.

Keywords: content analysis; emergency preparedness; pandemic; school nurse

What's important about this paper?

School nurses have faced tremendous occupational changes and challenges during the pandemic, including: new job responsibilities, managing conflict with parents and administrators, and working extra hours in part due to budgeting and staff limitations. This study characterizes these challenges through a review of media articles covering these experiences. The collective insights from this review will inform emergency preparedness for school nurse support during future pandemics and outbreaks.

Introduction

Professional nurses are the largest occupational group in the healthcare sector, accounting for 59% of healthcare workers worldwide (World Health Organization, 2020). Nurses remain critical for providing mental health, communicable and non-communicable disease care, emergency preparedness and response, and the delivery of integrated and people-centered healthcare (World Health Organization, 2020). While the equitable distribution and retention of professional nurses remain an important global priority (World Health Organization, 2020), the COVID-19 pandemic greatly reduced workforce capacity (Shaffer *et al.*, 2020). Further, a global nursing shortage exists where approximately 80% of nurses reside in densely populated countries, resulting in increased nurse-to-population ratios (Maré *et al.*, 2019; The McGill Nursing Collaborative for Education and Innovation in Patient- and Family-Centered Care, 2019; World Health Organization, 2020). School-based settings (K-12th grades) have been greatly impacted by the global nursing shortage as licensed nurses remain in short supply (Nwabuzor, 2007; Galemor *et al.*, 2019). School nurses have an essential role as a trusted source for health information, and the primary healthcare provider during school hours (Bannister and Kelts, 2011).

Full-time licensed nurses are associated with improved student health and educational outcomes, and reduced absenteeism (Bannister and Kelts, 2011; Jacobsen *et al.*, 2016; Yoder, 2020; Rankine *et al.*, 2021).

In the USA, most private and public schools do not have a full-time licensed nurse (National Center for Education Statistics, 2020; Howard, 2021) and shortages of school nurses have been anticipated due to an aging workforce (Galemor *et al.*, 2019). Many schools use hybrid health models that include full-time unlicensed assistive personnel (UAP) or multiple UAPs who manage student health, often under the supervision of a licensed nurse. Outside of pandemic responsibilities, school health staff serve several important roles, including attending to student health needs (i.e. physical and psychosocial support), administering medications, and completing administrative tasks.

At the beginning of the COVID-19 pandemic in the USA (February–March 2020), states began enacting school closures (Rothstein and Olympia, 2020; Yong, 2021). Many of these closures lasted through the remainder of the academic year (Rothstein and Olympia, 2020). For schools that reopened for in-person instruction during the 2020–2021 academic year, licensed school nurses and UAPs took on additional

pandemic-related responsibilities with new guidelines and protocols for disease mitigation, case identification, contact tracing, and quarantine and isolation procedures being released (Maughan *et al.*, 2021). A national survey of school employees representing 45 states in the USA reported social distancing, resurgence of COVID-19, and availability of supplies as the top concerns among school employees including school nurses (Pattison *et al.*, 2021). A survey conducted among the school nurses in Pennsylvania reported almost half of the nurses handling communication with parents and students regarding COVID-19 guidance (Hoke *et al.*, 2021). Assessments of the occupational risks and burdens placed on school nurses and UAPs related to the COVID-19 pandemic and emergency are limited, especially for US school nurses and UAPs.

Understanding the occupational risks and burdens faced by school nurses and UAPs, including the psychological stressors, will be important for preparing this workforce for future outbreaks or pandemics. Even before the pandemic, stress among school nurses has been observed, where school nurses face challenges including not having enough time or resources to address students with chronic illnesses, a high workload and ‘pressure from administration’ (Powell *et al.*, 2018). Powell *et al.* (2018) found that the greatest contributor to distress was being unable to ‘provide adequate care to students with chronic illness because of time constraints’ (Powell *et al.*, 2018). In a survey of school nurses in 2016, workload was identified as the main occupational stressor (Jameson and Bowen, 2020). While the American Academy of Pediatrics recommends at least one full-time registered nurse per school (Council on School Health *et al.*, 2016), this standard is not met in many schools across the country. Furthermore, school nursing budgets are often one of the first sections to be reduced within a school budget, increasing workloads (Jameson and Bowen, 2020). This prepandemic history of budgeting issues and high workloads for school nurses has raised concerns about the mental wellbeing of school nurses during the COVID-19 pandemic, during which workloads have been higher and resources even more constrained.

Study objective

The objective of this study was to evaluate contributions to psychological stress for licensed school nurses and health staff during the COVID-19 pandemic and to evaluate areas of needed support to inform guidance for school districts in preparation for future outbreaks or pandemics. We retrieved information from US media articles regarding changes to school health personnel

responsibilities and job experiences and resulting contributions to stress.

Methods

Search strategy/screening protocol and inclusion/exclusion criteria

After consultation with a librarian from the University of Arizona Mel and Enid Zuckerman College of Public Health, two databases were systematically searched using the following keyword search terms, ‘COVID AND (“school nurse” OR “school nurses” OR “school nurse’s” OR “unlicensed assistive personnel”)’. The first database, Nexis Uni, is an academic research tool that catalogs news articles (i.e. media), business and legal resources (LexisNexis, n.d.). We also searched Google using an identical search strategy. Articles were initially screened by one team member using a screening tool developed *a priori* (see [Supplementary Materials](#), available at *Annals of Work Exposures and Health* online). Articles were considered for full review that met the following inclusion criteria: (i) published in the USA; (ii) categorized as a newspaper, weblink, blog, news transcript, magazine, or journal; (iii) published between February 2020 and September 2021; and (iv) if the answers to the following questions were all ‘yes’:

Does the article describe school nurses or UAP within the context of new job responsibilities, stress, or risks due to COVID-19 as a contribution to stress of school health personnel?

- (1) Did the media discuss only US schools?
- (2) Did the media source specifically discuss the COVID-19 pandemic?
- (3) Was the media published in English?
- (4) Was the type of media an article, website, or transcript of a video?
- (5) Is it a unique article (i.e. not duplicated)?

Reviewers read each article in detail and removed from the sample irrelevant articles that made only passing references to school health staff or were duplicates of the same event (Fig. 1). Articles considered for full review were independently screened by at least two team members for inclusion in the review. Disagreements about whether an article should be included or excluded were settled through arbitration with the senior author. Because article links through Nexis Uni can become unavailable over time, screenshots were taken on 19 November 2021, to document the articles available at the time of our initial search. All articles that were unavailable after 19 November 2021 (or the link was broken) were excluded from review.

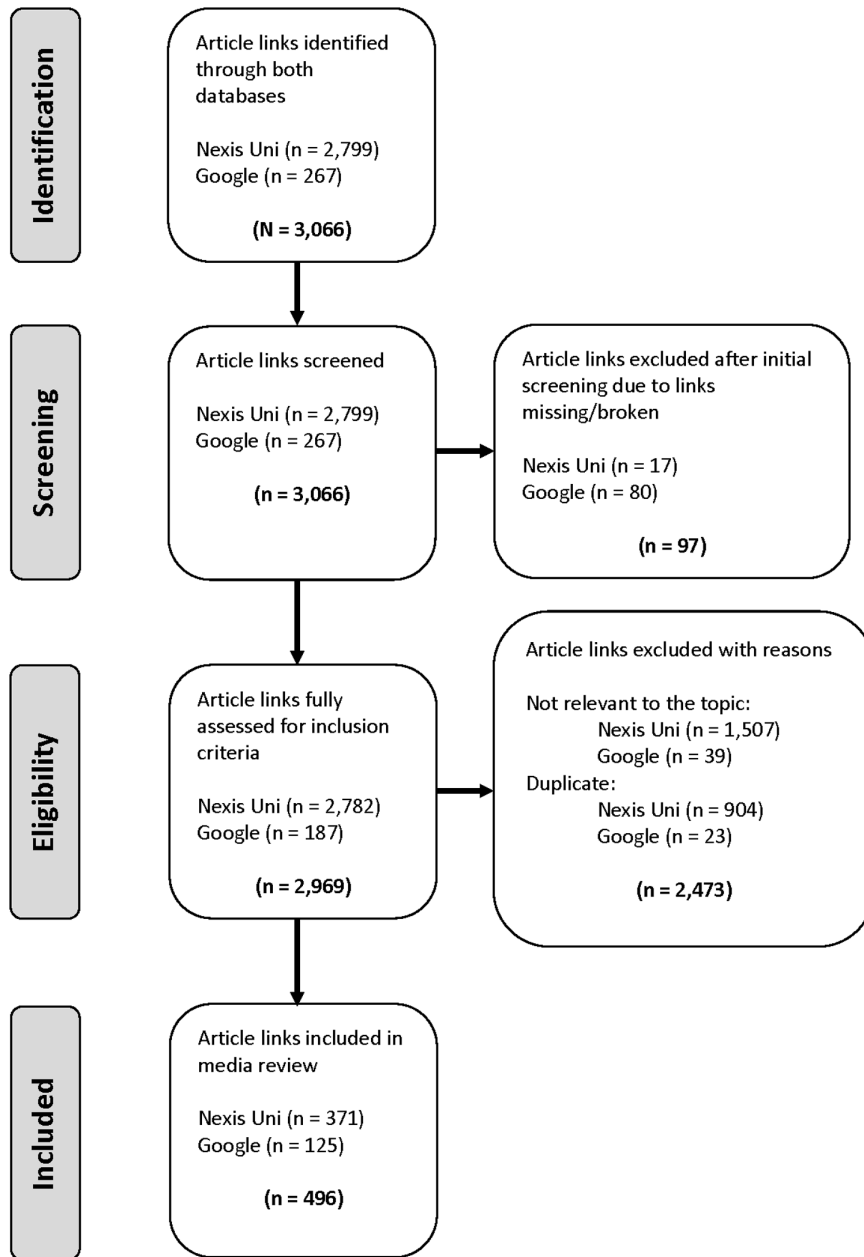


Figure 1. Flowchart of media articles included in analysis, 2020–2021.

Data extraction protocol

Data were extracted using a data extraction tool developed *a priori* (see [Supplementary Materials](#), available at *Annals of Work Exposures and Health* online) by two team members. Data extracted from articles included: (i) title; (ii) date of publication; (iii) location (local, state, regional, and national); and (iv) whether

direct quotes were used and, if so, the three most pertinent direct quotes with the role of the person quoted. Location was defined as (local, state, regional, and national) and categorized using the news sources' intended audience. We categorized each media source based on their respective location and intended audience where local was categorized as news articles distributed to a

city or group of neighboring cities; state included articles that covered news across a single US state; regional included multiple US states grouped within a geographic area (e.g. tri-state area); and lastly, national news was distributed across the USA. Up to three topics were identified per article. Three topics per article was deemed an appropriate amount based on team discussion and preliminary article screening. Article topics included air quality/filtration, cases, communication/guidance, conflict, contact tracing, in-person/virtual learning, job tasks, positive acknowledgment, personal protection equipment (PPE), resources, social distancing, testing, vaccinations, and other (with an opportunity to specify the topic). These topics were chosen based on a full team discussion following screening of articles. Primary, secondary, and tertiary themes were coded, with options including (i) safety (as it relates to conflict with parents/community members and risks of COVID-19 infection or student and staff that contribute psychological stress); (ii) pandemic-related fatigue/stress; and (iii) nursing shortage/budget. These topics and themes were chosen based on a full team discussion following screening of articles and based on the experiences of two of the authors (L.B. Gerald and A.A. Lowe) who have attended meetings including school health personnel during the pandemic and/or spoken with school nurses about their experiences and stress during the pandemic. Through the third theme (nursing shortage/budget), we considered media data related to budgets, nursing shortages, and retention in US schools, since low nursing retention has implications for the stress, and therefore health, of those who continued to work and took on additional responsibilities. This informed a focus on specific contributions to stress as opposed to a full occupational hazard approach. Themes were considered primary if over 50% of the article discussed the given topic. All articles that discussed additional topics that were not the primary topic of the news article were coded as secondary and tertiary themes. Consensus in data extraction and coding among the two members was evaluated, and articles lacking in consensus were discussed by the whole team to resolve coding discrepancies. If the 2 team members could not come to a consensus, the senior author made the final decision.

Content analysis

We used a directed content analysis approach with a deductive process where themes were developed by two of the researchers who have extensive experience working with school nurses during the COVID-19 pandemic (Hickey and Kipping, 1996; Kyngäs and Vanhanen, 1999; Potter and Levine-Donnerstein, 1999). Each

media article was read in its entirety by two researchers to obtain a sense of the whole. Both researchers applied topics based on the manifest content and then classified them into themes representing the latent content. Disagreements were resolved by a third reviewer. New themes were applied when identified in the analysis. Identified themes and topics were visually inspected over the timeframe of article publication, where changes in representation of topics and themes among articles were investigated relative to the timing of start of school years, returning to school after break, vaccine roll out (for adults or children, since school nurses were involved in administering vaccines to both populations), and implementation of testing programs. Themes and topics were also visually inspected across geographical space to evaluate how the volume and content of articles in the USA varied among states. Figures for these analyses were created using R, version 4.1.0 (R Core Team, 2021); R packages 'ggplot2' (Wickham *et al.*, 2021), 'ggpubr' (Kassambara, 2020), and 'ggalluvial' (Brunson and Read, 2020); and Tableau (Version 2021.4, Tableau Software, Mountain View, CA). For articles that were especially rich with detailed quotes from school nurses or about school health personnel and their experiences, key quotes that related to each of the identified themes were extracted.

Results

The initial Nexis Uni search yielded 2799 with articles ranging in publication date from 21 February 2020 to 30 September 2021 (Fig. 1). Google was also searched using identical key search terms, which yielded $n = 267$ news articles (26 pages). A team member screened these results and identified 496 articles to be screened by a second team member for inclusion. Fig. 1 illustrates the full screening process and articles that met our inclusion criteria. The final number of included articles was 496 (125 from Google, 371 from Nexis Uni), spanning in publication date from February 2020 to September 2021 (Fig. 1). A majority of the included articles were from September 2021 (22%, 111/496) (Fig. 2A). Other months with relatively high volume of articles included August 2020 (9%, 43/496), January 2021 (10%, 47/496), February 2021 (9%, 44/496), and August 2021 (8%, 39/496) (Fig. 2A). These larger article volumes coincided with notable COVID-19 events (Fig. 2B), including returning to school in the fall (August 2020 and August 2021), school nurses assisting with vaccine rollouts among adults in the USA (January/February 2021), concerns regarding the delta variant (August/

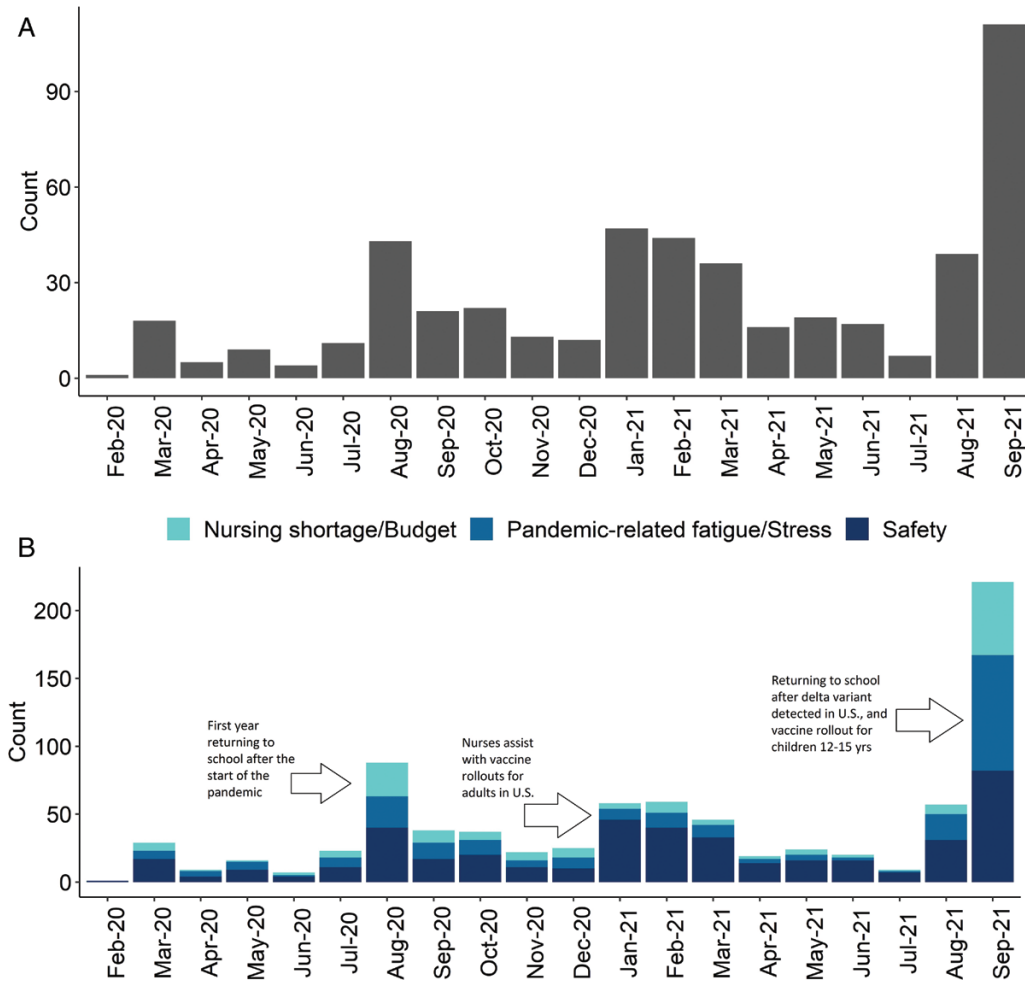


Figure 2. Themes of news articles from February 2020 to September 2021, (A) article by date and (B) article by theme (the count of articles in (B) are greater than the total *n* of articles because some articles had more than one theme identified).

September 2021), and vaccine rollouts for children ages 12–15 (September 2021).

Overview of reviewed articles

The most represented theme for articles before September 2021 was that of safety, identified in 70% (347/496) of all included articles and accounting for 59% (347/587) of identified themes before September 2021 (Fig. 2B). It should be noted that because multiple themes were identified for some articles, the total counts represented by theme are greater than the number of articles (*n* = 811 theme counts versus *n* = 496 articles, with up to 3 themes per article). Job tasks including educating teachers and students, interpreting guidance, conducting temperature checks, assisting with seating charts, managing PPE enforcement (masks) and

communicating with parents about students’ health were discussed. In some cases, when schools went remote in the early months of the pandemic, school nurses experienced layoffs and others managed students’ health virtually. During this time, school nurses were concerned not only about ensuring the safety of their children from the pandemic but also how they would ensure safety of their children during virtual school. One nurse stated,

‘When we found out that our district would be remote for the rest of the year, it was as if a rug was pulled from under us. I’m the only nurse in my high school of more than 2,200 students. A large part of my role is completing Individualized Education Program (IEP) reports and case management for our special needs students, and I remember thinking to myself, “What’s going to happen to them?” I deeply worry about the mental health toll

this is taking on students who struggle to advocate for themselves. Before the pandemic, students would come to my office if they wanted to talk, but now students aren't reaching out as I hoped they would. Many of the parents in my community speak Spanish and even though I've shared that I'm bilingual, not many parents are reaching out either. As a nurse you want to save the world, but sometimes you have to do the best you can with the tools you're given' ([Unsung Heroes: School Nurses Adapting and Innovating in Response to COVID-19, 2020](#)).

Another stated,

'It was incredibly hard. As a nurse, all I could think about was how I was going to keep track of these kids. I oversee two elementary schools with more than 500 students each, and one of the schools that I take care of experiences significant rates of poverty. Many homes don't even have internet. Who's going to make sure these kids get fed? Calls to Child Protective Services have dropped over these past few months, and that's because school nurses and staff play critical roles in looking out for signs of abuse. And as we're planning to return to in-person schooling over the next few weeks, I'm thinking about new challenges around the bend, such as routine immunizations, discerning COVID-19 symptoms, navigating mask trading and even recess. We hoped to provide outdoor recess and mask breaks, but with the outbreak of forest fires in our state, we've been presented with even more new challenges' ([Unsung Heroes: School Nurses Adapting and Innovating in Response to COVID-19, 2020](#)).

Upon return to school in fall 2020, there was discussion of hiring more school nurses and budget constraints (in line with our second theme, nursing shortages and

budget constraints), with increased articles addressing resources in summer 2020 in preparation for the school year ([Fig. 3](#)).

'Currently, 25% of U.S. schools have no nurse at all. And about 40% of those schools have a nurse only part of the day—a nurse who's shared among several schools. What we know is that school nurses care for the entire student population, especially the most vulnerable students. School nurses are identifying students at risk and helping them get the care they need' ([Schools Face Shortage of Nurses as Districts Consider Reopening, 2020](#)).

Many expressed frustration that, '*There was a shortage before COVID, but COVID has made it even worse*' ([Jokich, 2021](#)), and '*It's weird that it takes a pandemic for people to be like, 'Oh, look at that, what you do is useful*' ([Levin, 2020](#)). However, the important tasks that school nurses took on during COVID shed light on the issue of the shortage. Articles highlighted this issue and the importance of school nurses not just during the pandemic:

'School nurses operate as health educators, nurse advocates, care managers, and nurse leaders. During the school day, school nurses support students with chronic health conditions such as diabetes, asthma, seizures, anaphylactic allergies, cystic fibrosis, and many others. We deliver direct care from minor injuries to emergencies, promote health and safety, provide care coordination, address social determinants of health, and develop vital school health policies, plans, and procedures. Most recently, school nurses have stood at the front-line of defense during the COVID-19 pandemic. School nurses promptly collaborated with school administration and public health officials to ensure our youth were learning in healthy school environments and all efforts were made to protect the wellbeing and safety of our

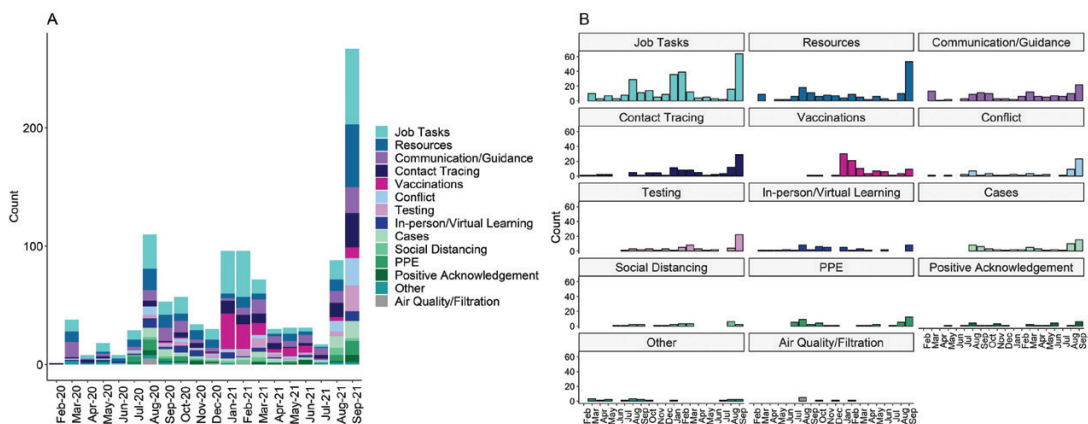


Figure 3. Topics of news articles from February 2020 to September 2021, (A) composite and (B) separated by topic (the count of articles in this figure is greater than the total n of articles because some articles had more than one topic identified).

surrounding communities' ([Tester Pushes to Hire More School Nurses, Improve Student Health in Underserved Montana Districts, 2021](#)).

As some schools returned in person in fall 2020, school nurses continued to experience new job tasks, including testing and managing conflict with administrators and parents over interpretation and/or implementation of guidance. For example, one school nurse said,

'School nurses have simply been stretched very thin, especially those of us in place in schools. We're not being able to do that which we feel called to do and being turned into contact tracers, quarantine enforcers, and all of that COVID stuff. There's no bones about it. We're exhausted. You hear about health care workers in the hospital leaving their jobs. We're just as tired from tracking students, tracking families, and living the political battles of masks or no masks. We're doing our best to maintain the physical and mental health of our students and school staff' ([Sloomaker, 2021b](#)).

A new job task was then added in early 2021, where school nurses were volunteering and, in some cases, pulled from schools to facilitate vaccine rollouts for adults in the USA. Some expressed that this was a rewarding experience: *'It's a really rewarding thing, because people are incredibly grateful (and) they thank us profusely, which is nice to hear'* ([Perry, 2021](#)). School nurses were responsible for other tasks, including contact tracing and managing new testing programs, often comprising a majority of their time and requiring extra hours. Contact tracing was often noted by nurses as a very time-consuming new task. One school district in Georgia estimated the hours their 18 school nurses had spent doing contact investigation using a formula developed by Neustar, Inc., a tech company that provides services for the Health and Human Services Departments in the states. According to this formula, each COVID-positive case takes nearly 130 min of time to trace (23 min for a contact exposure to a confirmed case that results in a quarantine, 30 min for a confirmed case and 72 additional minutes per case for follow-up calls and missed dials). This district has 9 elementary, 4 middle and 3 high schools and serves approximately 10 900 students. By week 40 of the 2020–2021 school year, these nurses and their support staff have invested 3004 h of contact tracing which is equivalent to 375 days of work. A school year is 180 days. The district had 652 confirmed positive cases and 4946 quarantines resulting from contact with a confirmed positive case in school during this 40-week time period.

Nurses report that just this one new duty alone has completely changed their jobs. One said,

'I kind of felt like originally the role of the school nurse was to help students and staff be healthy to stay in school. Now, it seems like we are trying to identify students and staff that are symptomatic, that we need to exclude from school—to keep those that are here, healthy and safe, which is kind of a complete turnaround from what our roles were a year ago' ([Matheson, 2021](#)).

Another commented that,

'We've really had to take on an entire new role on top of our role,' she said. 'Being a researcher, an investigator. Connecting with our (local) public health and monitoring trends and assisting our districts with protocols and ways to support students that both work educationally and in healthy and safe ways' ([Wanielista, 2020](#)).

In September 2021, the proportion of articles with a pandemic-related fatigue/stress theme greatly increased ([Fig. 2](#)). Some nurses stated increased cases and, as a result, increased burden of contact tracing:

'This has put a lot of strain on me mentally and physically. I have gained about 30 pounds and started therapy due to anxiety and depression. Contact tracing is 100 percent on me and the nursing team. Just this last week I put in 40 hours of overtime. I'll have staff members calling me at six o'clock in the morning telling me their symptoms. It is literally around the clock, all days, holidays' ([Singh-Kurtz, 2021](#)).

Political tension around the pandemic heightened, increasing conflict with parents, administrators, and politicians regarding mask usage and vaccines. Reports of pandemic-related stress greatly increased, and school nurses were in the middle of these conflicts. One nurse reported, *'We had a school board meeting pretty recently and the parents called us child abusers for having our kids wear masks'* ([Singh-Kurtz, 2021](#)). Another stated,

'Our nurses have been yelled at a lot and cussed at. That's stressful and undesirable, but it's thrown on top of all the things we already do as school nurses. In addition to the stuff we already do, having COVID placed on top of that—it's exhausting. It's physically and mentally exhausting' ([Luthra, 2021](#)).

Nurses pleaded for parents to understand that they are doing their job and following protocols:

'I've witnessed school nurses making dozens of phone calls on Saturday and Sunday afternoons informing parents that they must keep their child home for 14 days. I've heard parents yell and argue. I've heard parents call nurses liars. I've heard parents lie. I've seen nurses exhausted and in tears. They did not sign up for this, and they are not in the business of keeping kids out of the classroom. They are doing their job and it is hard.

Very hard' (Schonveld, 2021). This time period was one of greatly increased stress and one nurse summed it up by saying, 'If I had to sum up the day—check on your school nurse, because they are not OK.....don't take it out on a school nurse.....they're just trying to do the best that they can with the guidance that we have from the experts' (Crash, 2021). Additional quotes per theme can be seen in Table 1.

Temporal trends of themes and topics of reviewed articles

In September 2021, the proportion of articles discussing pandemic-related fatigue/stress (our third theme) greatly increased (Fig. 2). Because multiple topics were identified for some articles, the total counts represented by topic are greater than the number of articles ($n = 1117$ topic counts versus $n = 496$ articles, with up to 3 topics per article). Resources, job tasks, communication/guidance, and contact tracing were consistently identified topics over the entire study period (February 2020–September 2021), where vaccination was a common topic around the time of vaccination rollouts for adults in the USA (early 2021) (Fig. 3). Over the entire publication period, the topics most associated with all three themes were resources and job tasks (Supplementary Fig. S1, available at *Annals of Work Exposures and Health* online), identified in 33% (162/496) and 56% (280/496) of the 496 included articles, respectively. Topics identified as 'other' included sanitization, classroom learning time, risk of infection for workers, quarantine, fear for students, mental health, verbal abuse from parents (similar to conflict), and general comments on safety. 'Other' topics were only identified in 20 instances. The least represented topic was air quality/filtration, identified in 1.6% (8/496) articles.

Spatial trends of themes and topics of reviewed articles

Out of the total 496 included news articles, representation of school nurses and COVID-related news were found in 66 (13.3%) articles at the national level, 217 (43.8%) state level, 25 (5%) regional level (i.e. county), and 188 (37.9%) local news at the city or village level. Table 2 describes the spatial characteristic of the media articles included in this review. Out of these, Pennsylvania was the most frequently mentioned state (30 articles, 7.4% of articles with state or local level mentioned) as compared with other states. Illinois (24 articles, 5.9%) was the second most mentioned state. The next most frequently mentioned states were Texas (23 articles, 5.7%), Minnesota (22 articles, 5.4%), and

Maryland (17 articles, 4.2%). Idaho was mentioned in one news article, while Arkansas, Louisiana, Nevada, North Dakota, and West Virginia were mentioned twice. None of the articles included in this content analysis covered Delaware, Hawaii, Nebraska, South Dakota, or Utah during this timeframe. We further examined U.S. Census regions and found the South region had the greatest number of articles (153, 35.4%) as compared with other Census regions in the USA (Northeast: 91, 21.1%; Midwest: 109, 25.2%; West: 79, 18.3%). Articles were most frequent in the South Atlantic U.S. Census Division (89, 20.6%) (Table 2). Fig. 4 illustrates the frequency of media articles that discussed school nurses and COVID-19 during the specified time period. All media articles that were coded as 'National' are not included in Fig. 4. Panel A depicts the raw frequency of media articles across the USA and Panel B depicts the frequency of media articles adjusted for the population (per 100 000 individuals) of each state. Wyoming and Alaska had the highest rate of media articles (1.9 and 1.4 per 100 000 people) when controlling for population of each state.

Discussion

School health staff have experienced increased occupational changes and burdens because of the COVID-19 pandemic. Particularly notable was the increase in job responsibilities, including implementing COVID-19 mitigation strategies, screening for symptoms, testing students and staff, conducting contact tracing and data collection, and ensuring the implementation of rapidly changing COVID-19 guidelines and protocols for schools and much more. In some cases, other responsibilities, such as interfacing with administration on development of COVID-19 response efforts, administering vaccines to community members and staff, educating staff, students and families on COVID-19, and mitigation/isolation/quarantining guidelines were also added. All these responsibilities were added despite limited staff and resources. In addition to new responsibilities, school nurses and UAPs faced increased risks of occupationally associated COVID-19 and emotional stress from caring for (and, in some cases, losing) students and staff with COVID-19, conflict with parents who disagreed with the schools' COVID-19 response and protocols, conflict with school administrators, and lack of funding and supplies to meet the new demands. As the COVID-19 pandemic has progressed, media coverage of the school nurse experience has increased, with a greater proportion of articles describing pandemic-related stress and fatigue (Fig. 2).

Table 1. Exemplary quotes per theme (safety, nursing shortage, pandemic-related fatigue/stress).

Theme	Quotes
Safety	<p>'I'm just going to say it, it feels like we're playing Russian roulette with our kids and our staff.' (Bolduan and Axelrod, 2020)</p> <p>'We actually did a survey of school nurses in late April to find out what equipment they had before schools closed. And 23% didn't have an isolation room. And many of them did not have the N95 masks or the PPE that you would have for health care providers. And those are pieces of equipment that are essential to have in the school building for the nurses who are health care providers.' (Schools Face Shortage of Nurses as Districts Consider Reopening, 2020)</p> <p>'We are in this continuing awful tragedy because we place little funds and muscle behind genuinely implementing and enforcing what we know works virtually absolutely—masks and eyewear, distancing, hand hygiene, avoiding large groups and to be outside. Most schools do not offer the infrastructure to employ these five simple methods well. Re-entry, as planned, is hollow, as outbreaks will occur, as said recently by state health officials. We accept this gathering inevitability too late, after the virus has found more wood to burn and cases go undetected.' (Wright, 2020)</p> <p>'School health is the hidden healthcare system. Many times school nurses are the only access to healthcare that students may have.' (Ikeeda, 2021)</p> <p>'School nurses do so much more than bandages and pills! We are the bridge for our students between safe education and management of chronic conditions. We are the voice to promote and work toward safe and healthy learning environments so teachers can do what they do best—teach!—without having to worry about how to manage student insulin pumps, inhalers, EpiPens and the like. We assess, diagnose, plan, intervene and evaluate our school students and environments in our daily professional practice. And that's why our voices should be heard in this health crisis—we understand the school setting and the needs of our education peers, yet we have the medical knowledge and perspective to bridge the two areas into the safest learning environment possible.' (Unsung Heroes: School Nurses Adapting and Innovating in Response to COVID-19, 2020)</p> <p>'Our school nurses form the frontline of the district's health services support for students. They are often the nearest and most visible health care professionals that children encounter, and they are often the first to report health related needs to parents. Our school nurses have always been essential members of the XXX team; however, these unprecedented times have highlighted just how indispensable they are in the operations of our schools. Their daily presence is a key factor in helping to keep students and staff healthy and safe every day for optimal learning.' (Tallman, 2020)</p> <p>'They're working on their school's pandemic plans, educating students and staff on COVID-19, and screening the sick—all while continuing their normal task of helping kids with chronic illnesses, checking in on the emotional health of their students, and making sure immunizations are up to date.' (Wetsman, 2020)</p> <p>'Almost all of our schools do not have full-time [health] coverage. These are the staff, the only staff in our schools, that are appropriately trained and properly equipped to deal with any symptoms or cases that appear to be COVID-like. They are absolutely essential.' (Orr, 2020)</p> <p>'That would be my magic-wand dream, because every American schoolchild deserves a school with a full-time school nurse, not just to help them navigate through a pandemic, but to support students every day with their physical and mental health and making sure that they're academically ready to learn' (Howard, 2021)</p>
Nursing shortage	<p>'Funding is a key issue. There is an inconsistent mishmash of state and local funding that puts small rural school districts with inadequate tax bases at a disadvantage.....And those areas also are likely to have a shortage of primary care pediatric health care providers as well.' (Howard, 2021)</p> <p>'When you get into a rural setting, you've got school districts, pre-pandemic, that saw a nurse once a week or once a month depending on where they were, and they share nurses with multiple districts that could be an hour away from each other—and then you get in the middle of a pandemic, and the nurses are needed, and we've never been leaned on in that way.' (Howard, 2021)</p> <p>'When I moved to the high school this year, not only did my caseload almost triple making that move, because I'm the only nurse in the high school, but we haven't seen a good majority of those kids in the building for 18 months. So, we're dealing with all of their chronic health conditions like diabetes, asthma, allergies, and then on top of that, toss in all of the mental health pieces. The anxiety about walking in the door that first time. Depression because they've been at home without any socialization with their peers. And then you've got Covid.' (Howard, 2021)</p>

Table 1. Continued

Theme	Quotes
Pandemic-related fatigue/stress	<p>'School districts are going, "Oh yeah, our nurse can do that," and just keep adding on these responsibilities. They don't understand that we don't have a nurse in every building. We don't have the staffing to cover all of these new needs, like training staff on P.P.E. and educating families on how to check for symptoms.' (Levin, 2020)</p> <p>'The testing program requires significant additional paperwork for each test, and there are plenty of competing priorities on school nurses' plates right now, from tracking and enforcing immunization requirements to caring for students with special health needs to contact tracing.' (Cohn, 2021)</p> <p>'When parents understand and keep their kids home when they are sick, it's a huge help to us, but when parents kind of fight the system and don't follow the protocol, it crushes us.' (Tooten, 2021)</p> <p>'I think last year I had said school nurses felt like the weight of the pandemic was on their shoulders. We're on our knees now with the weight of the pandemic on our shoulders. It really is a lot to bear. We are the only health care professional in the schools, and we have input and weight in on so many things.' (Caught Between Parents and Politicians, Nurses Fear Another School Year With COVID-19, 2021)</p> <p>'It's kind of like "Groundhog Day"—another year of contact tracing and vaccinating and kind of leading the kids back to school, you know, safety. So I do think we are traumatized, you know, to use that term. We are traumatized, and we—just like the children are, just like the teachers have, just like everybody has been with the pandemic. And just like our front workers in the hospital have, we do continue to do our job. We show up, and we continue to do our job. But we are feeling it.' (Caught Between Parents and Politicians, Nurses Fear Another School Year With COVID-19, 2021)</p> <p>'Because this was so new, the health departments didn't know how to navigate, and that put a lot of strain and stress on school nurses, more on school nurses than anyone would have anticipated. No one foresaw that. It was no one's fault.' (Sloomaker, 2021a)</p> <p>'The atmosphere is really awful. The teachers try really hard to stay positive, but a lot of them are scared. We've had some very, very sick staff members in the hospital. We've had some very sick nurses in the hospital too. They have all been unvaccinated with the exception of a couple who had pretty significant underlying health conditions. I try to tell them everything's going to be fine, and then I go home, and cry it out, because I have been running on fumes for about a year.' (Singh-Kurtz, 2021)</p> <p>'The number-one thing we've had lately is that parents are just sending kids to school sick. They know that they're sick, and they will downright lie. They will tell the kid to lie. We had one parent where if you mentioned COVID they just cut you off and say, I'm not going to talk about that. I don't believe in that. And they just hang up. Or they'll refuse to let the child come home, and we have to call the police to escort them home, which is such a waste of resources.' (Singh-Kurtz, 2021)</p> <p>'What COVID has done is give school nurses a second job.' (Singh-Kurtz, 2021)</p> <p>'All 500 kids came back and it's madness. I'm not sleeping. I don't get lunch breaks. I don't eat all day. I'm exhausted. What COVID has done is give school nurses a second job. You can't just say, "Oh, by the way, here's another full-time job added to your job." What? School nurses everywhere are burning out like crazy.' (Singh-Kurtz, 2021)</p> <p>'I spend every day contact tracing and implementing COVID protocols. I get phone calls all day long—"I've been exposed, my kid was exposed, this student was exposed." With all the calls and emails and forms and legwork, each case takes a couple hours, and so it's impossible to get your regular work done. I'm trying to take care of diabetics and I'm trying to distribute medication, but you can't do it, because the health room is so busy. I chart—document student symptoms, vitals, and so on—for free on weekends. I don't get paid for it at all. I'm just getting my work done so I can have some peace of mind. Otherwise I come in Monday morning and I'm so behind and it just gets worse and worse.' (Singh-Kurtz, 2021)</p> <p>'Not to mention, the school nurses here are paid terribly. When school started they told me they cut my hours because they couldn't afford to pay me a full day, so my paid hours went down from seven and a half to six and a half and I'm working for nearly nine. So I come in early and don't get paid. I stay late. I don't get paid. I need more help, but they don't have the budget to hire someone. We are on our own. That's the sad truth of it.' (Singh-Kurtz, 2021)</p> <p>'I've got angry parents because I haven't called them back, I've got parents screaming at me about the guidelines, about the timelines for quarantine. You just get browbeaten, you just get sick of it.' (Singh-Kurtz, 2021)</p>

Table 2. Characteristics of media articles discussing school nurses and COVID-19, 2020–2021.

Characteristics	N = 496 (%)
Location type	
National	66 (13.3)
State	217 (43.8)
Regional	25 (5.0)
Local	188 (37.9)
U.S. Census region	
Region 1 (Northeast)	91 (21.1)
Region 2 (Midwest)	109 (25.2)
Region 3 (South)	153 (35.4)
Region 4 (West)	79 (18.3)
U.S. Census Division	
Division 1 (New England)	40 (9.3)
Division 2 (Middle Atlantic)	51 (11.8)
Division 3 (East North Central)	55 (12.7)
Division 4 (West North Central)	54 (12.5)
Division 5 (South Atlantic)	89 (20.6)
Division 6 (East South Central)	30 (6.9)
Division 7 (West South Central)	34 (7.9)
Division 8 (Mountain)	32 (7.4)
Division 9 (Pacific)	47 (10.9)

Kunz *et al.* (2022) reported school nurses participating in a task force with the director of a county public health nursing department, nurses from a communicable disease department, and epidemiologists to ‘provide consistent county-wide implementation of COVID-19-related protocols’ (Kunz *et al.*, 2022). This type of communication/guidance work was also identified in our analysis, where the media articles also captured school nurse involvement in vaccination and testing outside the school environment. The new job tasks captured by our content analysis and challenges experienced by US school nurses are similar to those described in published literature for school nurses in other countries during the COVID-19 pandemic (Barbee-Lee *et al.*, 2021; Lee *et al.*, 2021; Martinsson *et al.*, 2021). In a study of school nurses in Hong Kong, semistructured interviews and qualitative analysis were used to identify and analyze three major themes: ‘managing stress’, ‘navigating the school through the pandemic’, and ‘raising the profile of the school-based school nurses professionals’ (Lee *et al.*, 2021). Some of the described challenges included lack of PPE, lack of space to implement social distancing, and lack of guidance and training specific for school nurses until May 2020 (Lee *et al.*, 2021). In Korea, researchers conducted qualitative interviews to examine school nurses’ experiences coping

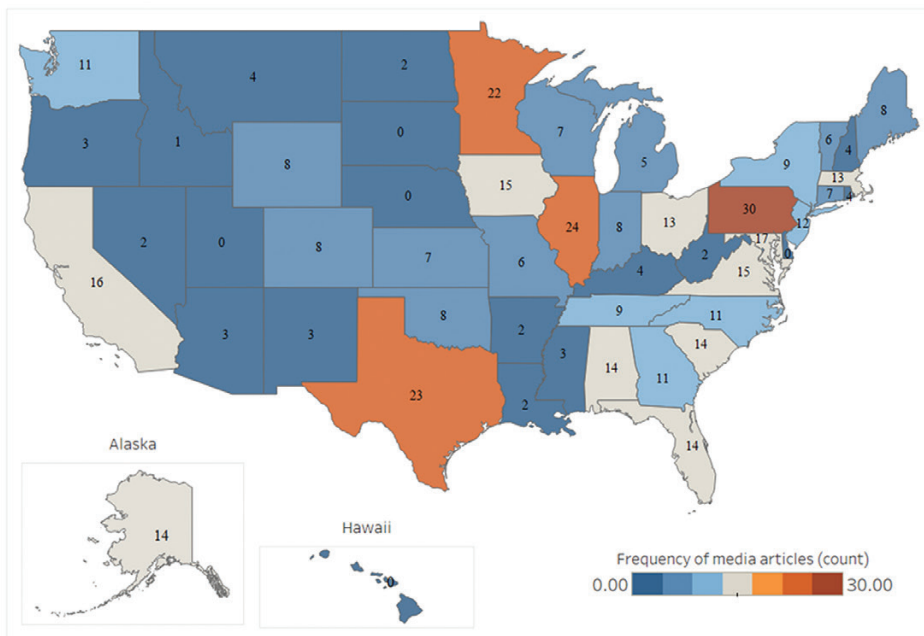
with infectious diseases while working in schools. The research team analyzed over X to understand the essence and meaning of the psychological and social experiences of school nurses during an epidemic. Results indicated the nurses experienced increasing job duties and recommended that additional school nurses be assigned to schools (Um and Choi, 2022).

In addition to similarities between our findings and other studies of school nurses during the pandemic, the identification of job tasks and lack of resources as being the two most consistent topics across themes (Fig. 3) in this study is consistent with research on school nurses before the pandemic that reported workload as a major contributor to burnout (Jameson and Bowen, 2020). This indicates that workload, lack of adequate resources (i.e. staff), and subsequent burnout may continue to be challenges for school nurses beyond the pandemic, weakening schools’ ability to respond to future pandemics or outbreaks. More recently, studies have been conducted across the world that examine the experiences of school nurses during the pandemic. The needs and experiences of school nurses captured through this content analysis can inform current and future emergency preparedness efforts to provide school nurses with the needed support to adequately address the health of school children and surrounding communities.

Limitations

One of the limitations of this study was analyzing news articles whose links occasionally would change or be removed from the internet. We addressed this challenge by using screenshots of available articles and regularly reviewing access to links of included articles. In some cases, articles would focus on the overall school experience during the pandemic with little information pertaining to school nurses. This created challenges when screening articles and extracting data for the purpose of capturing the school health staff experience, specifically. Few articles differentiated between school nurses and other school health staff. Despite this limitation, the review did provide useful information and direct quotes that captured school health staff’s pandemic experiences. It is unknown, however, whether these news articles capture the full breadth of the school nurse experience, especially considering that staff may be reluctant to speak freely when being interviewed for a news article. Historically, the media has emphasized positive stories of the nursing experience (Mason *et al.*, 2018). Yet, as this review demonstrates, recent media articles across the USA depict a different experience that has resulted in occupational challenges including stressors and

- A Choropleth map of United States illustrating the frequency of media articles discussing school nurses and COVID-19, 2020-2021.



- B Choropleth map of United States illustrating the frequency of media articles discussing school nurses and COVID-19 per 100,000 people, 2020-2021.

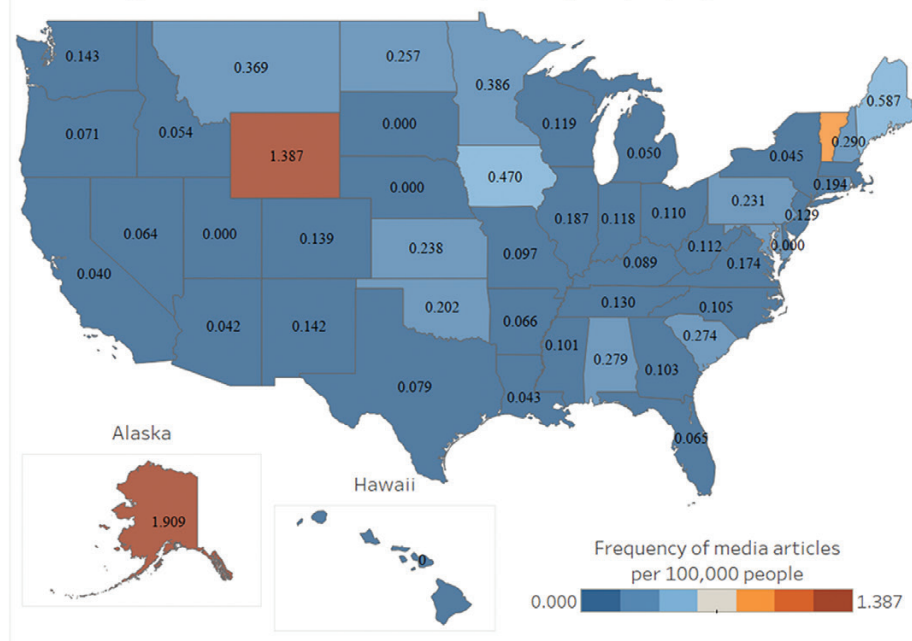


Figure 4. Maps of the USA and media articles discussing school nurses and COVID-19, 2020–2021, (A) raw frequency of articles and (B) frequency of articles adjusted for population.

fatigue. While the public can benefit from reading stories that include nurse perspectives, the limited proportion of articles discussing nurses highlighted the need for more representation of the nursing experience in the media, including opportunities to provide important health information to the general public.¹ We also did not extract data related to other hazards aside from stress that could result from changes in job responsibilities among nurses and acknowledge there were likely other effects on the occupational health of school health personnel aside from psychological ones such as increased stress.

One of the benefits of using a media analysis in this study is it allowed for a rapid analysis of themes across a large geographical space (USA) across over a year's worth of data from news outlets. This is especially a benefit when conducting time-sensitive public health research, such as during a pandemic. However, the results should be interpreted with caution due to the novelty of media analysis within occupational health and uncertainties regarding the reliability of analyzed media analysis in representing the true psychological stressors that school nurse and health personnel face. For example, individuals with overwhelmingly negative or positive experiences may be inclined to respond to media requests, introducing a bias to analyses that utilize these media sources. Negative experiences and challenges overwhelmingly outweighed positive experiences captured by the media in this study, meaning that our results likely overestimate the true burden of psychological stress on school nurses. It is also possible that school nurses in more rural settings or areas with limited media coverage are not as represented in this study as those in areas with high coverage. In general, prior to COVID-19, nurses had relatively low representation in health news stories, where only 2% of article quotes were attributable to nurses (Mason *et al.*, 2018). Lastly, confirmation bias may result from the research team's extensive experience working with school nurses during the COVID-19 pandemic. To eliminate this bias, we worked carefully to conduct a systematic review of the media using data collection tools and search methods developed *a priori*. Despite these limitations, the findings of our study are consistent with studies that implemented other methodologies that involved direct communication with school nurses, such as through focus groups (Martinsson *et al.*, 2021) and semistructured interviews (Lee *et al.*, 2021). However, more evaluation of media analysis for addressing occupational health research questions is needed in future work. Additionally, there is a need for conducting private focus groups with school nurses to gain further insights into the challenges and occupational stressors that the COVID-19 pandemic has introduced.

Conclusion

School nurses are continuing to experience growing occupational challenges during the COVID-19 pandemic that are affecting their level of stress and fatigue. This ultimately affects school nurse retention and our communities' ability to respond adequately to the pandemic needs of schools. As one nurse said, 'I've had days where I don't know if I can keep doing it.' (Cohn, 2021). One of the major needs identified in this study and in others (Powell *et al.*, 2018; Jameson and Bowen, 2020; Lee *et al.*, 2021) is greater financial resources, especially additional staffing, in order to reduce workloads and subsequent psychological stress.

'When school nurses have several schools and they're seeing 4,000 to 5,000 students in the course of a week, they're unable to do the work that they know how to do in the way in needs to be done. It's not a solution to put a Band-Aid on an issue that's so deep and meaningful for the life and learning of all students' (Sterman *et al.*, 2021).

School nurses play a critical role in disease surveillance, disaster preparedness, wellness and chronic disease prevention interventions, immunizations, mental health screening and chronic disease education. Furthermore, they provide a safety net for our most vulnerable children. A recent cost-benefit analysis of school nursing services found that for every dollar invested in school nurses, society would gain \$2.20 (Wang *et al.*, 2014). School nursing is a specialized practice that advances the wellbeing, academic success and lifelong achievement and health of students. It is essential that all students have access to a full-time school nurse all day, every day.

Supplementary data

Supplementary data are available at *Annals of Work Exposures and Health* online.

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Conflict of interest

The authors are employed by the University of Arizona who provided funding for this study. The authors declare no conflict of interest relating to the material presented in this article. Its contents, including any opinions and/or conclusions expressed, are solely those of the authors.

Data availability

No data were used in this study.

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