SPECIAL FEATURES - EDUCATION

COVID-19 updates: Real-time epidemiology for BSN community/public health nursing course

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Abstract

Teaching nursing students about epidemiology is often a daunting task, with many lacking the knowledge and application of and interest in epidemiological elements. Baccalaureate science nursing (BSN) essentials state that BSN nursing students need educational applications for health promotion and disease prevention for effective population-based communities. The COVID-19 pandemic data have allowed for real-time analysis and synthesis of live application of data which meets the specific requirements on current and future epidemiological problems. Nursing students can monitor weekly trends through disease surveillance and application to the surrounding community, providing for effective critical thinking and clinical judgment. Comparing weekly changes in data assists in developing interest on applying this information for practice. Discussion about background evidence, valid national, regional, and local websites, specific implementation steps, and overall student reflection feedback will be discussed.

KEYWORDS
community nursing, COVID-19, epidemiology, health promotion, public health nursing, reflection

1 | BACKGROUND

The spring semester of 2020 in nursing education was forever changed by the COVID-19 pandemic. Changing the format from face-to-face to online in the middle of the semester presented multiple challenges for nursing students. Community and Public Health nursing content in BSN programs can be seen by nursing students as not applicable to their future in the nursing profession. However, COVID-19 data have provided the perfect avenue to apply epidemiological, statistical, and evidence-based elements to the didactic online classroom.

The Essentials of Baccalaureate Education for Professional Nursing Practice provide a curriculum framework for BSN nursing programs. Essential VII, Clinical Prevention, and Population Health are directly related to components of the community and public health nursing course. Health promotion and disease prevention are needed to improve population-based health throughout the lifespan and include assisting all components of the population-based community for preparation of the consequences of emergencies, such as seen with the COVID-19 epidemic (AACN, 2008).

A baccalaureate program must provide the nursing student educational population-based opportunities. Since health promotion and disease prevention are the key components of population-based health, BSN nursing students need specific education on essential skills that relate to today's world. One clear need is the knowledge to use evidence-based practices to guide disease and outbreak investigation throughout the lifespan. Another applicable point is nursing students must use effective and appropriate nursing judgment during disasters and other emergency situations. Providing for content related to epidemiology and biostatistics (distribution, incidence, prevalence, rates, risk factors, health status indicators, and control of disease in populations) as well as global health are examples of sample content that meets the expectations of this essential component (AACN, 2008).

In 2013, the American Association of College of Nursing (AACN) published a supplemental document to the BSN Essentials that was directed toward recommended competencies and curricular guidelines for public health nursing. Each one of the BSN Essentials was further developed past the generic competency statements to include rationale, suggested content, and suggested teaching to encompass public health nursing perspectives. BSN Essential III, Scholarship of Evidence-based Practice specifically contains further rationale on the baccalaureate nurse to have a foundation of epidemiology to evaluate evidence from population-based data. Content suggestions were the need for effective assessment and planning of population health services using vital statistics and other population data for assessment and planning of health services. Suggested teaching strategies included the introduction to the National Center for Health Statistics datasets and reports and illustrate their use in working with communities and populations (AACN, 2013).

A Future of Nursing report (2019) examined several nursing curriculums throughout the United States specifically analyzing the concept of population health. The report finding identified the need to thread the concept of population health throughout the BSN curriculum. Specific content was identified as relevant content to include is epidemiology and biostatistics. Further specific clarification illustrated a need for basic understanding of the distribution and determinants of health and illness across populations. An additional emphasis was the ability to use basic terms to describe health and illness across a population.

Due to content and number of topics to be covered, BSN nursing students may only receive 1–2 hr on responding to a public health emergency or disaster. Nursing educators must make sure that nursing students are able to have the knowledge, the skills, and the abilities during clinical rotations or as future nurses practicing in the profession to keep both themselves and the client safe (Redden, 2020). As disasters with accompanying communicable components and epidemiological components emerge in the United States and around the globe, threats to community and public health will increase in nature. The demand will grow for nurses who are better prepared to understand surveillance and outbreak investigation skills as well as how to handle these types of complex disasters (Downes, 2015).

The World Health Organization (WHO) (2020) noted the need for future nurses to be trained more in-depth regarding infectious diseases and possible future pandemics. Increasing the curriculum content with specific importance on primary care, highlighting client safety, and preventing/controlling infection outbreaks will be critical. Nursing students need be equipped with tools on their role in managing epidemics utilizing population-based health (Morin, 2020).

Healthcare providers need to be prepared to engage in management of disasters and pandemics. Healthy People 2030 has a developmental goal that reflects the importance for individuals to be trained to meet the ever-changing global health issues that is to increase the number of individuals trained globally to prevent, detect, or respond to public health threats. The developmental goal does not have any baseline data that currently project the competent amount of training with operational evidence-based interventions. Once baseline data are available, this goal may be considered a core Healthy People 2030 objective (Health People, 2020).

Nurses have a responsibility to be knowledgeable about threats to their community no matter where they practice. Understanding how to prevent epidemics along with the spread of communicable diseases is a crucial core function of all nurses. Understanding epidemiology is a skill that all nursing students must be taught to ensure the protection of the public and the population. Critical epidemiology skills for all nurses involve the systematic analysis, interpretation, and use of health data to identify health status, plan programs, and evaluate outcomes (AACN, 2020). Infection control and prevention content can be threaded through multiple courses or offered as real time training. At a minimum, basic infection control and prevention topics related to COVID need to cover surveillance and detection, isolation, quarantine, containment, precautions (standard, contact and airborne), proper etiquette (hand washing, cough, and respiratory), and how to select and use personal protective equipment (AACN, 2020).

1.1 | Initial implementation

In mid-March 2020, classes were moved from a face-to-face platform to totally online due to the COVID-19 pandemic. Moving online presented a challenge to providing effective active learning strategies to engage the students in both didactic and clinical. COVID-19 incidence was also increasing in different areas of the country. Nursing students were presented with options to remain on-campus or move back home across the United States.

The challenge became how to effectively meet the objectives of the course in both the didactic and clinical arena using an online platform. Most students chose to leave the campus, but this allowed for students to be situated in many areas of the country. These students were very attuned to COVID-19 rates and policy changes happening in their local communities.

Understanding of the realities of COVID-19 was still emerging, and local, state, and national agencies were trying to find evidence-based knowledge and treatment. In March, DKBmed, a medical education site for healthcare providers, started a weekly video series utilizing Dr. Paul Auwaerter from Johns Hopkins University (DKBmed, 2020). A series began on DKBmed called *COVID: A moving target*. The beginning webinar consisted of an introduction to COVID-19 which all students were required to attend and to answer discussion questions about the content.

During the remainder of the spring semester, weekly COVID-19 updates were discussed in terms of overall US cases, state, and county incidence cases from Florida and Lee County (site of the university/ school of nursing) and county incidence cases. Later in the semester, incidence rates per 100,000 were added for high-incidence counties to compare different areas in Florida. DKBmed (2020) continued to provide a weekly update usually released on Wednesday. During the didactic class, specific changes in the COVID-19 rates were analyzed

and noted for changes in rates, and the DKBmed webinar was played during class with focused discussion. Following the webinar and discussion, students engaged in debate about what they saw and heard as well as utilizing the affective domain of learning.

Data regarding changes in COVID-19 rates at a global, national, state, and local level used the evidence-based, reliable websites. John Hopkins Resource Center had a dashboard with data updated daily. The John Hopkins site has evolved as the pandemic continues with more information on global country numbers, national data specifically at the state level, and further breakdown into counties (Johns Hopkins, 2020). The site provides rates per 100,000 at the county level, as well as total cases and deaths. The Florida Department of Health COVID site is updated daily with new COVID numbers for the state and county levels. Further information on positivity rates and testing numbers were available to download and share with the students (Florida Department of Health, 2020).

2 | JOURNAL REFLECTIONS

Nursing students were required to complete a weekly journal that included identifying two topics from the class, how they felt about the topics, why they chose the topics, and how they would implement in a community clinical setting. The reflective journaling had been a long-standing requirement of the course even before COVID became an issue.

Reflection is identified as an essential educational skill for all nurses (ANA, 2010). Ruiz-Lopez et al. (2015) recognize reflection as vitally important as a nurse is no longer expected to only provide technical skills but also to provide value through critical thinking and judgment. Miller (2017) discussed that reflective journal leads to development of skills for growth of personal values as well as an outlet for students to voice feelings about the topic or situation.

Journaling is an effective learning and teaching strategy within education and nursing to meet student learning outcomes. Most reflective journals are utilized in the clinical arena, but application in the didactic course is still an effective learning strategy. For this class, the reflective journal used both the cognitive and affective domains of learning. The cognitive domain allowed the student to recall, think, and understand specific topics/concepts during the course. The affective domain permitted expression of feelings and attitudes toward a particular topic/concept (Miller, 2017).

The reflective journal also had benefit for the instructor. Chng (2018) utilized a reflective component for a computer class. An important aspect for students was to understand the use of reflection. Teachers tend to rely on familiar teaching and learning assessment techniques, and students may see this reflection process as busy work. Educators need to ask themselves what they want to achieve by using reflection and relay this information onto the students. Telling the students that information noted from the reflection will provide a clarification and deeper learning of the content. Reflection can then be used as a formative assessment to direct the educator to content that is still not grasped by the student.

3 | STUDENT FEEDBACK

Most of the feedback from the students was obtained from the weekly reflective journal. Each week, most students reflected on the state of the COVID-19 pandemic. Weeks when numbers increased or there are specific updates from the DKB webcast, lively discussions occurred that allowed for debate among the class members. Many voiced concerns using the affective domain of learning about COVID, while others were able to apply solutions on how to implement changes in the community clinical arena. Providing a means for students to express their feeling about COVID promoted improved resilience and self-esteem thus possibly reducing anxiety (Savitsky et al., 2020). Monitoring student's mental health during a pandemic, such as using the reflection journal tool, also allowed the educator to intervene immediately to reduce the consequences related to the pandemic by providing social support (AACN, 2020; Cao et al., 2020).

Many of the students provided very valuable formative feedback about COVID-19 and epidemiology. Comments noted in the weekly self-reflection journals included increased understanding of epidemiology terms such as rate per 100,000, incidence, prevalence, application of statistical terms and trends, the role of educating individuals, families, the community about local COVID-19 trends, and expressing concerns about the COVID-19 pandemic. The student reflection journal comments noted the importance of knowing current data and terms to debunk the many myths of the pandemic, as well as what mitigating, and policy changes were needed to implement at the community level.

4 | ONGOING IMPLEMENTATION AND RE-EVALUATION

In both Summer and Fall 2020, the didactic class was started with discussion about weekly changes to COVID or new updated information for class discussion. The students expected the class to begin with discussion about the pandemic and to remain updated on new changes and trends. Weekly reflection journals continued to support the approval of understanding weekly changes to policies, vaccine development, and increasing COVID numbers and trends.

During the Summer, webinars on DKBmed expanded and were utilized in both the didactic and clinical arena. Webinars with individuals who are directly involved with issues related to COVID are shared with interested viewers. At first webinars were only one time a week but now have expanded to twice weekly. Topics on personal protective equipment (PPE); health inequalities for specific populations such as homeless, vaccination development, and COVID; and human immunodeficiency virus (HIV) were examples of effective webinars used to enhance interactive teaching strategies as well as appealing to different types of learners (DKBmed, 2020).

The summer and fall community classes remained online used the same format from the second half of the spring semester. This allowed for the summer group to experience changes in rates and

deaths during the peak of the summer months. As the third wave of COVID became an issue, the fall cohort examined what needs to be implemented to control the pandemic during the winter months. Familiarity with terms such as incidence and prevalence led to a better understanding of how to analyze epidemiological data in a constructive way.

As 2020 progressed, further evidence-based sites were added to provide a variety of websites. However, providing students with a structured education framework, high-quality online synchronous didactic and clinical courses, and most importantly encouraging and supporting student's anxiety and fear about their future practice provided students with the stability they have needed during the pandemic (Savitsky et. al., 2020). Consistent data from reliable websites allowed students the ability to monitor rising trends around the country as well as in the local community (Table 1).

5 | IMPLICATIONS

Using the weekly updates for COVID-19 allowed for introduction of other aspects such as global health, health disparities, and social determinants of health (SDOH). As more data were obtained, clear disparities with COVID-19 and minorities were established. Application of the SDOH categories of economics, built environments, and healthcare were noted as problems associated with COVID-19. McNiel and Elertson (2017) noted the importance of preparing nursing students for public health crisis situations. The addition of specific education on future infectious disease outbreaks highlighted the importance of faculty adjusting focus and priorities with student curriculum to meet core baccalaureate essentials and address current public health needs.

Clark et al., (2016) completed a systematic review of essential global and public health core competencies for nursing education. One of the core competencies was global burden of disease. In relationship to this global competency was the public health/community health component of epidemiological skills and public health biology. Combining both core competency foci led to a new combination

named disease burden and epidemiology (Clark et al., (2016). Further, a description of this new combination stated that the nursing student should know the major disease conditions/health problems and their underlying pathophysiology and variation in global distribution. The student should be able to employ epidemiological skills in surveillance, screening, and assessment of current diseases that affect the country and global communities. Students who are knowledgeable in these global and public health competencies will be better prepared for future global disasters.

Nursing instructors can utilize current resources to provide active learning for their community health students. Allowing students to reflect on what they have learned along with feelings about the content can promote conversations. This can be accomplished using a reflection journal as well as structured discussions and debates during the class. Both the chat room and verbal responses can provide a deep discussion between the students allowing for fears, concerns, and information to be disseminated among all students. Students are fearful about practicing in an arena where COVID is present. However, if students understand what is happening and know where to go to find evidence-based information, their anxiety could be lessened.

These community health students were seniors who had their ability to do live clinical rotations stopped due to the pandemic. Preparing these students for graduate nurse life involved the need to provide evidence-based knowledge about the pandemic. Not only was the didactic class moved to a synchronous online format, but the clinical portion became a structural synchronous format. Some of the DKB webinars were used for clinical credit as real time discussion about issues related to COVID provided. Flexibility in all areas of the community health course must be the most important aspect to provide future success for graduating nurses (Zerwic et al., 2021).

As a community and public health nursing educator, the opportunity to teach real live epidemiological principles is rare. The pandemic provided the chance to delve into providing students access on a weekly basis to epidemiological terminology, principles, and application to a real live situation. The ability for nursing students

TABLE 1 Evidence-based COVID-19 resources

Name	URL	Specific information focus
johns Hopkins COVID resource center	https://coronavirus.jhu.edu/ https://coronavirus.jhu.edu/us-map	Data on United States, individual states as well as breakdowns for each county
DKB med	https://covid19.dkbmed.com/	Webinars on COVID updates
Florida department of health	https://floridahealthcovid19.gov/	Specific state statistics as well as reports on counties, pediatric data, long-term facilities data. Please refer to your own state or country site.
World health organization	https://www.who.int/emergencies/ diseases/novel-coronavirus-2019	Press conferences on updates at a global level
Center for disease control (CDC)	https://www.cdc.gov/coronaviru s/2019-ncov/index.html	Evidence-based information on vaccines, rates, etc.
AACN resources for educators	https://www.aacnnursing.org/ News-Information/COVID-19	Highlights key information for nurse educators

to articulate, understand, and apply terms such as rates per 100,000 was astonishing and rewarding. The challenge was to prepare nursing students in the future as unique challenges are continuing to emerge daily. The pandemic has shown the need for real-time education on social justice, ethics, leadership, and most of all effective patient care (Dewart et al., 2020).

COVID-19 is a turning point in how future nursing education needs to possibly change to meet student needs. Evaluation of strategies to prepare nurses for future pandemics and health service protocols needs to be established to enable formulation of effective health care professionals (Cervera-Gasch et al., 2020). Nursing instructors must take the lead and incorporate teaching strategies that provide the student with practical application. As healthcare transitions from acute care to population-based settings, undergraduate nursing programs are positioned to support the prospect of well-prepared nurses who are equipped to deliver health promotion and disease prevention interventions in those arenas (Steffy, 2019).

6 | SUMMARY

Nursing education needs to change in relationship to the changes occurring with global diseases. Nurses practicing in all setting need to be familiar with epidemiological elements and how to utilize evidence-based resources to provide the best care for the populations they serve. The current COVID-19 pandemic has provided real-time application of epidemiology skills for today's nursing students. Reflection journals provide use of the cognitive and affective domains of learning that allow a nurse educator to analyze whether students are meeting course outcomes. Nursing educators need to take full advantage of the aspects of a once in a lifetime pandemic and provide the education needed for future nurses.

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