



Impact of the COVID–19 Pandemic on the Professional Training of Student Nurses from Universities in Ghana

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Abstract

On December 31, 2019, the World Health Organization (WHO) was informed of cases of pneumonia of unknown cause in Wuhan City, Hubei Province, China (WHO, 2020). Initial viral testing detected a novel coronavirus in these patients. Subsequently, the disease progressed into a pandemic. The novel coronavirus disease is caused by the SARS-CoV2 (WHO, 2020). To curb the spread of the disease in Ghana, the government announced a series of comprehensive measures, including the closure of all schools; Basic, Junior High, Senior High and Universities. The health care workforce-in-training have been affected by this move, including student nurses who were just about to write their licensure examinations and continuing students. This study therefore sought to investigate the impact of the COVID-19 pandemic on the professional training of student nurses from Universities in Ghana. Regarding the current level of knowledge of the pandemic, student nurses showed average knowledge of the dynamics of the disease. More than half of student nurses were able to tell how the disease is transmitted, how the disease is tested and how the disease is prevented. However, there was deficient knowledge in the causative agent of the disease, who was at greater risk of acquiring the disease and the recent emergency signs and symptoms of the disease. The major impact of the pandemic on the nurses is the online learning medium which was adopted as the means of teaching and learning in the period. The students concur that the online medium of instruction is deficient of the standard method the nursing education programme is to be tutored. Results showed a significant difference ($P=0.014$) of the impact of the pandemic among the student nurses from the various Universities. The nursing profession continues to attract those who strive to help mankind, even in its darkest hours. Student nurses are no exception, as evidenced by their choice and determination to study and practice nursing.

Keywords: COVID-19, Ghana, Online Learning, Student Nurses, Universities.

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INTRODUCTION

The World Health Organization (WHO) declared a global health emergency of international concern on January 30, 2020 due to the novel coronavirus disease. On February 11, 2020, WHO announced a name for the new coronavirus disease as COVID-19 (WHO, Coronavirus disease (COVID-19) pandemic, 2020). Apropos, this time in history is scary, and we are facing many unknowns. The entire world is struggling against the virulent pandemic. We are witnessing an extraordinary global spread of the disease and unfortunately, each of us is affected either overtly or covertly. As such, the race is on throughout the world to develop COVID-19 therapeutics and vaccines and end a contagion that threatens to infect a substantial portion of human population and perhaps kill millions of people. As billions of dollars flow into research and development efforts aimed at controlling the virus, the pandemic response remains blur by our limited understanding of how to generate effective preventive measures.

Coronaviruses (CoVs) are enveloped, positive-sense, single-stranded RNA viruses that belong to the subfamily Coronavirinae, family Coronaviridae, order Nidovirales. There are four genera of CoVs, namely, *Alphacoronavirus* (α CoV), *Betacoronavirus* (β CoV), *Deltacoronavirus* (δ CoV), and *Gammacoronavirus* (γ CoV) (Chan et al., 2013). Evolutionary analyses have shown that bats and rodents are the gene sources of most α CoVs and β CoVs, while avian species are the gene sources of most δ CoVs and γ CoVs. (Chan et al., 2013). CoVs have repeatedly crossed species barriers and some have emerged as important human pathogens. The best-known examples include severe acute respiratory syndrome CoV (SARS-CoV) which emerged in China in 2002–2003 to cause a large-scale epidemic with about 8000 infections and 800 deaths, and Middle East respiratory syndrome CoV (MERS-CoV) which has caused a persistent epidemic in the Arabian Peninsula since 2012 (Chan et al., 2015; Cheng et al., 2007). In both of these epidemics, these viruses have likely originated from bats and then jumped into another amplification mammalian host, the Himalayan palm civet (*Paguma larvata*) for SARS-CoV and the dromedary camel (*Camelus dromedarius*) for MERS-CoV before crossing species barriers to infect humans (Chan et al., 2020).

Prior to December 2019, 6 CoVs were known to infect human, including 2 α CoV (HCoV-229E and HKU-NL63) and 4 β CoV (HCoV-OC43 [lineage A], HCoV-HKU1 [lineage A], SARS-CoV [lineage B] and MERS-CoV [lineage C]). The β CoV lineage A HCoV-OC43 and HCoV-HKU1 usually cause self-limiting upper respiratory infections in immunocompetent hosts and occasionally lower respiratory tract infections in immunocompromised hosts and the elderly (Chan et al., 2015). In contrast, SARS-CoV (lineage B β CoV) and MERS-CoV (lineage C β CoV) may cause severe lower respiratory tract infections with acute respiratory distress syndrome and extrapulmonary manifestations, such as diarrhea, lymphopenia, deranged liver and renal function tests, and multiorgan dysfunction syndrome, among both immunocompetent and immunocompromised hosts with mortality rates of ~10% and ~35%, respectively (Yeung et al., 2016).

On December 31, 2019, the WHO country office in China was informed of cases of pneumonia of unknown cause in Wuhan City, Hubei Province. Initial virologic testing detected a novel coronavirus in these patients. The novel coronavirus is caused by the SARS-CoV2 (WHO, 2020).

The worldwide statistics (as at June 28, 2020) reported over 10 million confirmed cases, 5.09 million recovered cases and over 500, 000 deaths from 216 countries, areas or territories with Brazil being the new epicenter of the disease (WHO, 2020). The statistics for Ghana (as at June 28, 2020) reported 16, 742 confirmed cases, 12, 720 recovered cases and 112 deaths with the Greater Accra Region having the highest number of cases, 9,326 (<https://www.ghanahealthservice.org/covid19>). To wit, nurses, physicians and other

healthcare professionals are working around the clock to care for an ever-growing number of patients.

To curb the spread of the disease in Ghana, on March 15, 2020, the government announced a series of comprehensive measures, including the closure of all schools; Basic, Junior High, Senior High and Universities. However, the measures taken to contain the virus are impacting schooling in a negative way. The closure of schools has disrupted learning across the country impacting students and student nurses alike including students who were just about to write their licensure examinations. Globally, more than 1.6 billion students are out of school (UNICEF, 2020). Ongoing studies have been interrupted and upcoming semesters and studies cannot begin until they are adapted to the new reality. Hospitals across the country cancelled clinical rotation for student nurses, consequently, all nursing schools also suspended clinical rotations for their students. Nonetheless, there was the need to limit hospital access to essential staff and to ensure that all resources are focused on fighting the pandemic.

The impact of this discontinuity in the training of nurses has the tendency to lead to forgetfulness and loss of proficiency, since nursing practice is a hands-on and continuing process. This study therefore sought to investigate the impact of the COVID-19 pandemic on the professional training of student nurses from universities in Ghana.

METHODS

Research design

This cross-sectional study sought to investigate the impact of COVID-19 on the professional training of student nurses from Universities in Ghana, using a descriptive design.

Study sample

The study sample included student nurses from Universities in Ghana with nursing education accreditation who are training student nurses who had recently finished their nursing education training and waiting to write their licensure examination, level 400 and level 300 student nurses.

Sample Size

The single population proportion was used to determine the sample size. Thus, the estimated minimum sample size was 384. At the start of data analysis, 505 responses had been received giving an allowable addition of 31%.

Sampling Procedure

The convenience sampling procedure was used to include student nurses from Universities in Ghana. The students were reached through the leaders of the Nursing and Midwifery Student Association (NAMSA) of the various universities. The leaders were tasked to ensure the questionnaires were received by only eligible students. This was done through personal contacts and via various WhatsApp group platforms and email addresses.

Data Collecting Instrument

A structured electronic questionnaire was prepared for data collection using Google forms (<https://forms.gle/kVnBWakyoZAJ2D1DA>). The questionnaire comprised 3 sections including the demographic details of the study sample, the level of knowledge on the COVID-19 pandemic and the impact of the pandemic on the professional training of the student nurses. Question items comprised close-ended questions that empirically answer the study objectives.

Data Collection Procedure

Data collection took place from April 30 to June 30, 2020. The e-questionnaire comprising the research study information and the consent form were emailed and/or sent via WhatsApp to student nurses of various universities to complete. Completed e-questionnaires were received into a newly created Gmail account.

Validity and Reliability of Data Collecting Instrument

Firstly, to minimize any difficulties with the questionnaire completion in order to increase data collection accuracy, a pilot testing was conducted among 10 student nurses waiting to write their licensure examinations and 10 level 400 student nurses from the Pentecost University. Additionally, the questionnaire was emailed to 2 experts in the field of nursing at the Ghana College of Nurses and Midwifery (GCNM) and the Nurses and Midwifery Council (NMC) to evaluate its content validity. All comments/suggestions from the students and experts were effected to increase comprehension and specificity which resulted in the final e-questionnaire.

Ethical considerations

The purpose of the study was explained to respondents via the research study information sheet. Any respondent who needed further clarification on the study had the option to message or call the investigators via contact numbers that were provided on the information sheet. Safeguards for confidentiality were assured and informed consent was obtained by all respondents. Respondents were informed they could decline to answer any questions or end the session at any time.

Data Analysis

The spreadsheet from the responses to the questionnaire was downloaded from the google drive cloud storage. Data was then checked for consistency and cleaned to facilitate data analysis. Frequency tables were used to present the results of the demographic characteristics of the study sample. Charts were used to report the level of knowledge of the disease among the study sample and frequencies were used to present the impact of the pandemic on the training on the study sample. An analysis of variance (ANOVA) test was conducted to determine the significant differences of the impact of the pandemic among the student nurses from the various Universities. Results were considered significant at $p \leq 0.05$.

RESULTS

Demographic details of student nurses

A total of 505 student nurses responded to the e-questionnaire that was sent to them via email and/or WhatsApp during the period of data collection. The sample comprised 110/505 (21.8%) male student nurses and 395/505 (78.2%) female student nurses (see Table 1). Their age ranged from less than 20 years old to nurses who were older than 41 years old. Majority of the sample (418/505) were aged between 20 and 30 years and they formed 82.8% of the total sample. An impartial distribution of student nurses was received from regions of the country which have major accredited nursing training schools. They included student nurses from the University for Development Studies (UDS), Christian Service University College (CSUC), Garden City University College (GCUC), Kwame Nkrumah University of Science and Technology (KNUST), KAAF University College (KAAF), Pentecost University (PU), St. Karol School of Nursing and the Central University (CU), University of Ghana (UG) who were awaiting to write their licensure examination, those in level 400 and those in level 300 (see Table 1 for distribution).

Table 1: Demographic details of student nurses

Demographic detail	<i>f</i>	%
Gender		
Male	110	21.8
Female	395	78.2
Total	505	100
Age (years)		
< 20	24	4.8
20 – 30	418	82.8
31 – 40	61	12.1
>41	2	0.4
Total	505	505
University attending		
UDS	70	13.9
CSUC	18	3.6
GCUC	36	7.1
KNUST	60	11.9
KAAF	30	5.9
PU	200	39.6
St. Karol School of Nursing	16	3.2
CU	20	4
UG	55	10.9
Total	505	100
Level		
Completed, awaiting licensure	72	14.3
Level 400	223	44.2
Level 300	210	41.6
Total	505	100

f-Frequency

%-Percentage

Knowledge of the COVID-19 Pandemic among Student Nurses

Due to study sample's capacity as health care persons, their current knowledge on the ongoing pandemic was assessed. The nurses were asked what is COVID-19, how it is transmitted, who is at greater risk of the disease, what are the current emergency signs and symptoms of the disease, how the disease is tested and how the disease is prevented. Regarding what is COVID 19, 240/505 (47.5%) had accurate knowledge of COVID-19 (see Figure 1). Concerning how it is transmitted, 334/505 (66.1%) had accurate knowledge of how the disease is transmitted (see Figure 2). Pertaining to who is at greater risk of the disease, 152/505 (30.1%) had accurate knowledge of who is at greater risk of the disease (see Figure 3). Regarding the current emergency signs and symptoms of the disease, 162/505 (32.1%) had accurate knowledge of the current emergency signs and symptoms of the disease (see Figure 4). Concerning how the disease is tested, 255/505 (50.5%) had accurate knowledge of how the disease is tested (see Figure 5). On how the disease is prevented, 485/505 (96%) had accurate knowledge of how the disease is prevented (see Figure 6). (The green colours of the pie chart shows the proportion of student nurses who answered accurately).

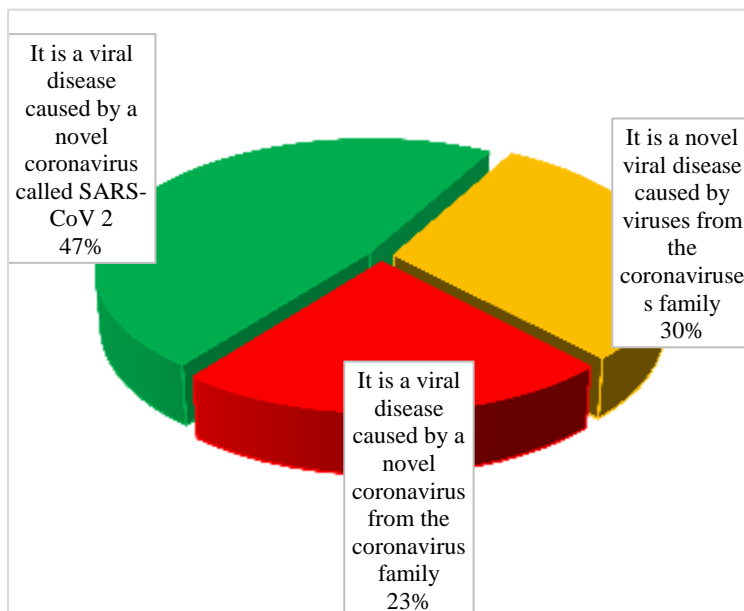


Figure 1: What is COVID-19?

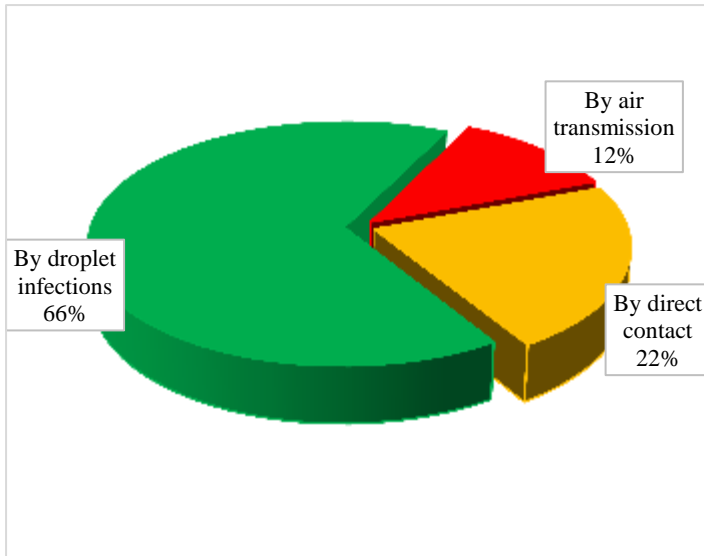


Figure 2: How is it transmitted?

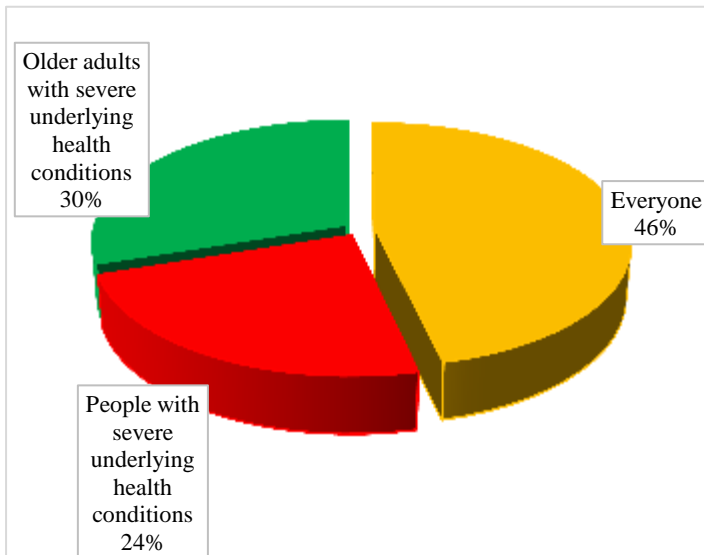


Figure 3: Who is at greater risk of the disease?

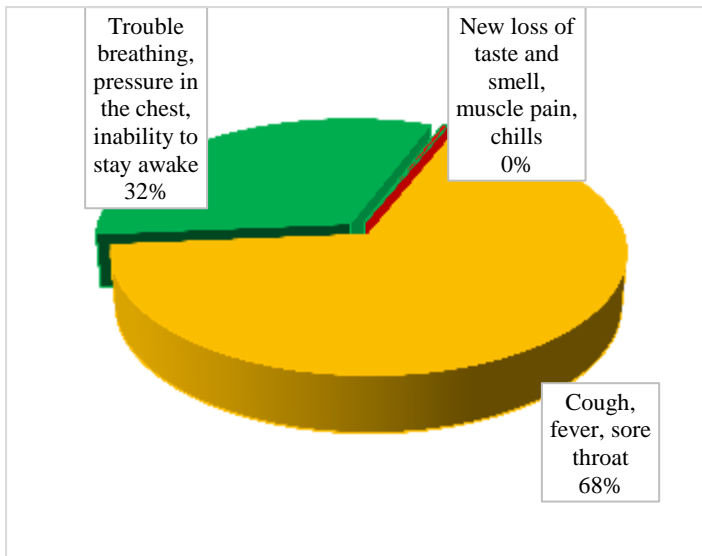


Figure 4: What are the current emergency signs and symptoms of the disease?

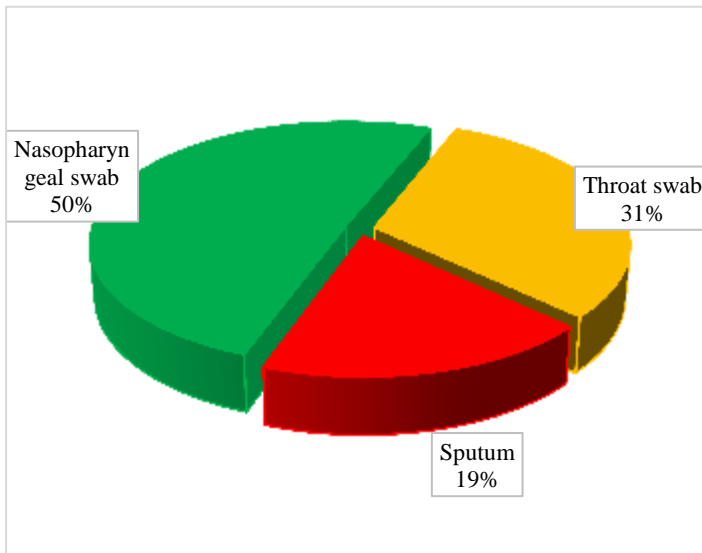


Figure 5: How is the disease tested?

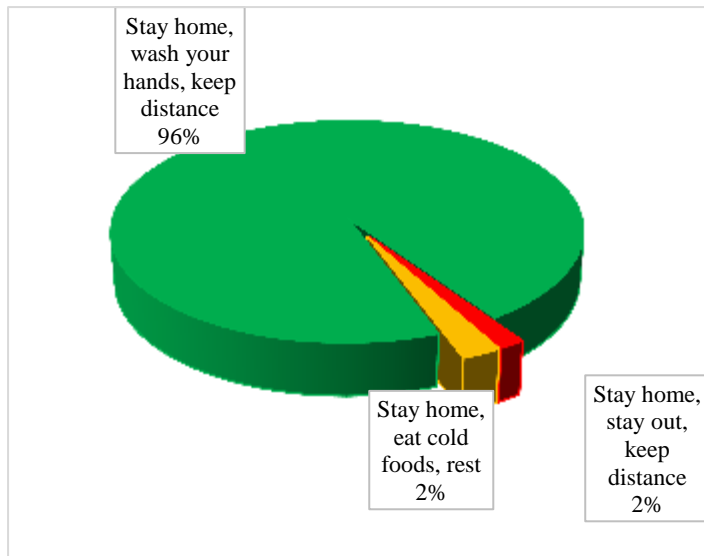


Figure 6: How is the disease prevented?

Impact of the COVID-19 pandemic on the Professional Training of Student Nurses

The impact of the COVID-19 pandemic on the training of the student nurses was evaluated (see Table 2). The prime effect of the pandemic on the nurses is the online learning medium which was adopted as the means of teaching and learning in the period. The students concurred that the online medium of instruction is deficient of the standard method of nursing education. An analysis of variance (ANOVA) test was conducted to determine the significant differences of the impact of the pandemic among the student nurses from the various Universities. Results showed that, there was a significant difference ($P=0.014$) of the impact of the pandemic among the Universities (F-statistic of 2.926). This means that, the differences in the intensity of the impact of the pandemic on the student nurses from the various Universities was noteworthy. The major five effects and the rest of the effects are presented in Table 2 below.

Table 2: Impact of the COVID-19 pandemic on the professional training of student nurses

Impact of the COVID-19 pandemic on the professional training of student nurses	<i>f</i>	%
1. The online learning medium being used to teach us is affecting my professional training as a nurse since the medium of instruction of our programme is not as such	268	53.1
2. The unknown of when I am going to complete and graduate from school	266	52.7
3. I have emotional and psychological stress thinking about the effect of the pandemic on my training	168	33.3
4. The whole experience of research work and patient care study is interrupted	150	29.7
5. Loss of lives of nurses in the fight of the pandemic has made me afraid of the profession	120	23.8
6. I am afraid I won't pass the licensure examination because I cannot study as I used to	110	21.8
7. I am afraid I will lose the ability to adapt to the evolving changes in the nursing and healthcare settings	94	18.6
8. I am afraid I will lose my skills in demonstrating sound specific clinical skills when providing care to patients	76	15
9. I am afraid I will lose my skills in demonstrating sound general clinical skills when providing care to patients	72	14.3

10. I now have fear/anxiety/lack of confidence/ inferiority complex towards the nursing profession	72	14.3
11. General dissatisfaction with the nursing profession	42	8.3
12. I am afraid I won't pass the licensure examination because I have forgotten all I learnt in preparation for the examination	40	7.9
13. Generally, I am afraid I won't pass the licensure examination	38	7.5
14. I am considering quitting the nursing profession altogether	38	7.5

f-Frequency

%-Percentage

DISCUSSION

COVID-19's ripple effects extend so far beyond health and health care. Regarding education, the unplanned and unprepared move to online learning affected the learning experience of all students in the country including Basic, Junior High, Senior High and Tertiary level. However, student nurses have a distinct set of challenges related to their education in the course of the pandemic. This study therefore sought to investigate the impact of the COVID-19 pandemic on the professional training of student nurses from universities in Ghana.

On the current level of knowledge of the pandemic, the student nurses showed average knowledge of the dynamics of the disease. More than half of the student nurses were able to tell how the disease is transmitted, how the disease is tested and how the disease is prevented. It is worthy to note that 485/505 (96%) of student nurses were aware of the preventive measures of the disease. This is basically due to the mass education and preventive campaigns by various stakeholders including the Ghana Health Service (GHS), Ministry of Health (MOH), Ministry of Information (MOI), media houses and individuals about the preventive measures of the disease in Ghana. Additionally, on June 15, 2020, the president by an Executive Instrument (EI) 164, Imposition of Restrictions (Coronavirus Disease (COVID-19) Pandemic) (No. 10) Instrument, 2020 ordered that a person shall wear a face mask, face shield or any other face covering that covers his or her nose and mouth completely, when the person is in a public place or leaving or returning to his or her place of abode. This directive is to further control the spread of the disease in the country. However, there was deficient knowledge in the causative agent of the disease, who was at greater risk of acquiring the disease and the recent emergency signs and symptoms of the disease. This may also be due to the focus of the mass education campaigns on the preventive measures of the disease and thus student nurses might not have paid attention to the other specific details of the disease. Possibly, students were also not keeping themselves updated on the progress of the disease.

The pandemic has also presented a unique educational crisis in recent history. Never have so many schools been closed at the same time. If school closures are extended, there is the risk of students falling behind their learning and the most vulnerable students never returning to school (UNICEF, 2020). As such, online learning has become the new medium of teaching and learning worldwide. Online learning is education that takes place over the internet (Stern, 2020). It is the umbrella term for any learning that takes place across distance and not in the traditional classroom setting. Within the past decade, it has had a major impact on postsecondary education and the trend is only increasing. Nevertheless, the results of the current study showed that the major effect of the pandemic on the training of the nurses was the use of online medium as the means of teaching and learning in the period. The students agreed that the online medium of instruction was deficient compared to the standard method of nursing education programme. The nursing education programme has criteria that has been established to meet accreditation standards for the clinical practice, academic content, and demonstration of professional outcomes set by the Ghana Nurses and Midwifery Council

(NMC). The curricula, which have been planned and designed to meet national and international education criteria, as well as professional and regulatory requirements for practice, exhibit a balance of theory and practice. The curricula establish a combination of in person pedagogy, on campus skills laboratories training, on campus simulation facilities training and the external clinical learning experience concurrently. The focus of both classroom and clinical education is to increase knowledge and practical skills needed by student nurses. This will enable graduates to meet the established competencies in nursing theory, interventions and scope of practice. This shows the current online learning technologies being used to teach among the Universities from our sample is indeed an underprovided means of training for student nurses.

Largely, the break in lectures also caused a disruption of intra-semester clinical rotations in hospitals because of the lockdown restrictions, cancellation or postponement of licensure examinations for the completed student nurses, a disruption in preparation of licensure examinations for continuing student nurses and the consequent interruption in the search for nursing job opportunities.

For the student nurses awaiting to write the licensure examination, depending on how long this pandemic last, could impact their ability to graduate; as indicated by the students as their second major effect of the pandemic on their training. In some states in the United States, test administrators of the National Council for Licensure Exam (NCLEX) came up with contingency plans for the final year student nurses. Such states e.g., Oregon, Texas, Wisconsin, temporarily waived the authority to write and pass licensure examinations before allowing student nurses to practice. They argued that it was imperative for student nurses to augment the nursing workforce and other patient care providers in the fight against the pandemic. *“These student nurses have completed their required theoretical and clinical hours and were only left to write their exams; thus, they are better positioned to help. In these critical times, a valuable source of emerging talents should not be blocked”*, said the Governor of Texas, Gregg Abbot (www.jff.org).

Clearly, we are in the middle of a pandemic, and exposing student nurses close to patients with COVID-19 against their wishes would be irresponsible. No matter how beneficial in-person training may be, student safety comes first and putting students on the front lines without their consent would be unfair. However, these aren't just any students. Student nurses set to graduate are in a unique position to observe how the profession they are entering responds to a crisis. They can learn how nurses work together to protect themselves and colleagues when faced with numerous work obstacles for the greater good of the country, how they educate the public and advocate for the health of the citizens and how they innovate in their day-to-day work. These future nurses might want the opportunity to help during a time of crisis in the health care system. Its advantage is for the student nurse to understand and appreciate the strength of the nursing profession. It might seem dangerous to allow someone to volunteer for clinical work in the middle of a pandemic, but it is partial not to give these students the opportunity. Furthermore, the understaffed health care system could certainly use the extra help.

For continuing student nurses in the various training programmes across the country, online learning could make the difference between an able future nurse and an incompetent future nurse. The online learning system has the ability to condense the standard of education for students. According to a study performed by the National Council of State Boards of Nursing (NCSBN), they found that online teaching could not entirely replace the traditional method of teaching because of the practical nature of the programme. They also found that virtual simulations and skills laboratory is not optimal in the training of future nurses (NCSBN, 2020). Applying knowledge gained over a computer is not nearly the same as applying the knowledge on a patient. No matter how much these clinical simulations

advance, no amount of online training can prepare a student to work in the intensive care units (ICU) especially, if they're planning to specialize in the care of vulnerable patients. Future nurses need a mix of hands-on experience and virtual training and it is crucial now in the history of health care that they receive it (NCSBN, 2020).

The emotional and psychological stress experiences among the study sample is warranted. Just recently, moderate to extremely severe scores of anxiety, depression, and stress have been reported by 21.34%, 34.19% and 28.14% respectively from university students in Spain. A total of 50.43% students presented moderate to severe negative psychological impact of lockdown restrictions and the subsequent closure of schools in Spain (Odriozola-González, Planchuelo-Gómez, Irurtia, & de Luis-García, 2020). Findings from Cao et al., (2020) among medical students indicated that 0.9% of the students were experiencing severe anxiety, 2.7% moderate anxiety, and 21.3% mild anxiety during this ongoing pandemic. Correlation analysis indicated the halt in academic activities, were positively associated with anxiety symptoms.

The sense of what it means to be a University student when one is separated physically from the campus; the sad feeling of what it means to be in a class when all you see and hear are images and voices of your class mates on screens and on phone, the uncertain thoughts of whether the usual class room life would ever return again, the upsetting question of what it means to have spent four years working towards a degree only to graduate in one of the greatest recessions yet: for student nurses, there is the special concern of whether their training at the clinical learning sites would ever be the same again. All of these fears are enough to trigger an immense sense of tension for students during this time.

The interruption of the whole experience of research work and patient care study was also prominent among the effects of the pandemic on their training. These courses are designed to introduce students to the use of the scientific process in identifying, studying and finding solutions to nursing problems. They stimulate and develop in the student research consciousness and a critical and creative mind necessary for the effective solution of nursing problems, through research and utilization of research results to promote evidence-based practice in nursing, hence the break is unpleasant.

Nursing, presently seems to be one of the most dangerous jobs. The International Council of Nurses (ICN) reports that more than 600 nurses have died from the virus (www.icn.ch). Student nurses reported that loss of lives of nurses in the fight of the pandemic has made them afraid of the profession. Nurses are at the forefront of the fight against the pandemic. Death of nurses is linked to the rising number of cases globally, increase infection rates among nurses and other health care workers and the lack of optimal Personal Protective Equipment (PPE) for nurses (www.icn.ch).

The least impact of the pandemic on student nurses from the current study, is the consideration of quitting the nursing profession altogether. This is well pleasing to know. The nursing profession continues to attract those who strive to help mankind, even in its darkest hours. Student nurses are no exception, as evidenced by their choice and determination to study and practice nursing.

CONCLUSION

Deficient nursing training education at this time not only limits the health care system's ability to respond to the COVID-19 crisis, but can also have longer-term repercussions on the next generation of student nurses. COVID-19 and other future pandemics may inflict both types of pain at once if in person lectures are disrupted and clinical training cancellations put their studies and career pursuits on hold. Now more than ever, our nation cannot afford to have nursing students defer or forgo their aspirations of starting health care careers.

Implications for Practice

Globally, online learning is catalyzing a pedagogical shift in teaching and learning. A shift away from the traditional top-down lecturing and passive students to a more interactive, collaborative approach in which lecturers and students enhance the learning process. Tertiary institutions with nursing education training programmes should start and develop if they are lacking and already existing ones should boost their Learning Management Softwares (LMS) or their Course Management Systems (CMS) to make it acceptable and appropriate for instructing student nurses in preparedness for any unforeseen event. The pandemic has resulted in many quarantined and physical isolation measures designed to keep individuals distanced from each other. Although these initiatives are necessary to prevent the spread of the virus, we must guard against their potential to cause widespread mental health effects including depression, despair, anxiety, stress and loneliness among students.

Recommendations

Online learning is the future of education. Tertiary institutions in Ghana have to equip and enhance their institutions online learning environment or platforms with a combination of cutting-edge technological resources for all types of student enrollments. This has the advantage creating enormous gains for both the institutions and students in the short- and long-term strategic goals and collaborations on local and international pedestals. Furthermore, Governments and hospital managements should activate appropriate measures to protect the lives of nurses and other healthcare professionals going forward.

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