

The Impact of COVID-19 on Medical and Registered Nurse Education



KEY FINDINGS

- The COVID-19 pandemic had substantial impacts on medical and registered nurse (RN) education
- At the beginning of the pandemic, medical and RN education programs experienced disruptions to clinical training
- Medical and RN education programs were forced to shift from in-person classes to online learning
- Despite pandemic challenges, most medical and nursing students graduated on time in 2020
- Medical and RN education programs continue to use some virtual learning strategies they developed during the pandemic

INTRODUCTION

The COVID-19 pandemic was a significant challenge for the nation's health care delivery and education systems. The pandemic exacerbated existing workforce shortages and negatively impacted clinicians' physical and mental wellbeing. Schools were forced to suspend in-person classes and shift to online learning. Health profession education programs were heavily impacted. Not only did they have to move to virtual learning, but they also lost clinical training opportunities for students when hospitals and other health care facilities were focused on pandemic response. Health profession education programs are crucial to the nation's supply of health care workers; disruptions to this pipeline could have long-term consequences on the adequacy of future supply. This research brief examines the impact of COVID-19 on undergraduate medical education and on RN education from the start of the pandemic up to the present. However, it is likely that other health profession education programs that rely on clinical training for their students were also affected.

METHODS

This mixed methods study included key informant interviews, an analysis of secondary data sources, and a literature review. Interviews took place during the fall of 2022 and focused on the following questions:

- How did COVID-19 affect your program in 2020? (eg, access to clinical training sites)
 - What steps did you take to make sure your students graduated on time?
 - Were they effective?
- Currently, how is COVID-19 affecting your program? (eg, faculty shortages, lack of clinical training sites, telehealth training)
 - What steps are you taking to address these issues? (eg, reducing the number of admissions to the program, building in telehealth training opportunities)
- As a result of these issues, have you made any long-term or permanent changes to your program?

Secondary data sources that were analyzed included:

- [United State Medical Licensing Examination \(USMLE\) Step 1 and Step 2 \(Clinical Knowledge\) Performance Data](#)
- [Integrated Postsecondary Education Data System \(IPEDS\) \(Degrees/Certificates Awarded\)](#)
- [National Residency Matching Program Data](#)
- [National Council Licensure Examination \(NCLEX\) RN Examination Statistics](#)

UNDERGRADUATE MEDICAL EDUCATION (UME)

The Impact of COVID-19 at the Start of the Pandemic

On March 17th, 2020, the Association of American Medical Colleges (AAMC) issued guidelines to medical schools that recommended temporarily suspending clinical training activities in order to preserve the supply of personal protective equipment (PPE), mitigate the spread of COVID-19, and protect students.¹ These suspensions reduced important clinical training opportunities for students.¹⁻⁶ Clinical suspensions were particularly disruptive to students who relied on rotations away from their primary institution to pursue their specialty of interest.¹

At the same time, UME quickly transitioned from in-person classes to an online format according to key informants. The lack of in-person classes led to a loss of opportunities for student collaboration with both peers and instructors. Many research conferences were also cancelled during the pandemic, leaving students with fewer opportunities to network, present their research, and learn from others.^{4,7}

Students' ability to take the United States Medical Licensing Examination (USMLE) was also affected by the pandemic. The USMLE was temporarily suspended in 2020 and many testing centers were closed due to public safety concerns.^{1,8} The closure of testing centers created confusion and delays in students' ability to take the exam.^{1,8} The percentage of people passing the USMLE Step 1 and Step 2 exams nationally remain unchanged (**Tables 1 and 2**). However, the number of exams taken in 2020 was lower than in the previous year, and there was a subsequent increase in the number of exams taken in 2021. The number of medical degrees awarded in 2020 was consistent with the number awarded in previous years (**Table 3**).

TABLE 1. Number of USMLE Step 1 Exams Administered and Percent Passing, 2018-2021

Degree	2018		2019		2020		2021	
	N	%	N	%	N	%	N	%
MD	21,611	95%	22,146	96%	20,343	97%	23,078	95%
DO	4,136	96%	4,837	96%	5,274	95%	5,365	94%
Total	25,747	95%	26,983	96%	25,617	97%	28,443	95%

Source: [United State Medical Licensing Examination \(USMLE\) Step 1 Performance Data](#).

TABLE 2. Number of USMLE Step 2 (Clinical Knowledge) Exams Administered and Percent Passing (July 1 to June 30)

Degree	2017-2018		2018-2019		2019-2020		2020-2021	
	N	%	N	%	N	%	N	%
MD	22,367	96%	21,721	97%	18,574	98%	24,019	98%
DO	3,076	94%	3,476	97%	3,362	97%	4,499	98%
Total	25,443	96%	25,197	97%	21,936	98%	28,518	98%

Source: [United State Medical Licensing Examination \(USMLE\) Step 2 \(Clinical Knowledge\) Performance Data](#).

TABLE 3. Number of MD/DO Degrees Awarded, 2017-2021

Degree	2017	2018	2019	2020	2021
MD and DO	25,011	25,810	26,420	27,015	28,087

Source: [Integrated Postsecondary Education Data System \(IPEDS\) \(degrees/certificates awarded\)](#).

Pandemic safety measures also added to the complexity of the highly competitive residency matching process. Key informants described the move to on-line residency recruitment interviews per AAMC and Accreditation Council for Graduate Medical Education recommendations to maximize safety.^{2,4,9} Some students encountered difficulty matching because of the disruption to clinical training. As Aiyyer (2020) explains, the suspension of clinical rotations:

- Impacted students' applications by making it more difficult for them to demonstrate their skills
- Decreased the amount of practice a student could get in a particular specialty area
 - This was especially the case if they did not have a program in that specialty at their home institution
- Eliminated valuable networking opportunities for students and decreased the pool of people from whom they could ask for a letter of recommendation

However, despite the additional challenges caused by the pandemic, the number and percent of people matching were in-line with prior years (Table 4).

TABLE 4. Number and Percent of Applicants Matching With a Program, 2018-2022

Type	2018		2019		2020		2021		2022	
	N	%	N	%	N	%	N	%	N	%
US Seniors-MD	18,818	94%	18,925	94%	19,326	94%	19,866	93%	19,902	93%
US Grads-MD	1,511	44%	1,485	45%	1,519	46%	1,672	48%	1,700	51%
US Seniors-DO	4,275	85%	5,478	88%	6,581	91%	7,101	89%	7,303	91%
Foreign	12,142	57%	11,949	59%	12,074	61%	13,238	57%	12,912	59%
Total	36,746	78%	37,837	80%	39,500	81%	41,877	79%	41,817	80%

Source: [National Residency Matching Program Data](#).

The Long-term Impact of COVID-19

While the move from in-person to virtual learning during the pandemic led to many challenges for students and faculty alike, there were also advantages to the virtual environment that led to permanent changes. Even though it often required a higher level of motivation, online learning was more flexible for students and allowed them to have greater control over their education.^{3,10} For example, students could watch recorded lectures at their own convenience. The online format was also effective in allowing and encouraging collaborations between programs.³ New teaching methods³ and virtual education materials¹⁰ could be developed and shared with a wider audience than before. Some programs continued to utilize remote learning where appropriate. In addition, some programs continue to use virtual meetings for faculty advising and mental health services because it allows for meetings on short notice and at more flexible times.

Conference cancellations also presented many challenges, but this led individuals to devise new and innovative ways of presenting their research virtually.⁷ The pandemic also led medical education programs to rethink their teaching practices. For example, in one medical school, clinical training now begins earlier than in previous years so that students have more time to decide on a specialty and begin practicing skills. In terms of patient care, innovations like telehealth and virtual rounds continue to increase patient access to services and give students, doctors, and patients alike more flexible ways of interacting with one another.^{3,10}

Residency application interviews continue to be conducted remotely in 2022.^{3,4} A benefit of virtual interviews is that it eliminates travel costs for students and allows individuals with limited financial resources to participate in more interviews. However, virtual interviews can make it more difficult for students and programs to make informed decisions about proper fit since they are not able to interact with each other in person.² Ultimately, while the pandemic presented several challenges to the medical education community, it also led to some innovations which are still in use today.

RN EDUCATION

The Impact of COVID-19 at the Start of the Pandemic

The COVID-19 pandemic had a greater impact on RN education than on medical education according to key informants. Clinical placements were much more challenging at the beginning of the pandemic and this led to fewer opportunities for nursing students to train at the bedside.^{11,12} RN education programs relied more on simulation to help students acquire important clinical skills.¹³

Much like medical education, the pandemic also led to an abrupt shift from in-person to online learning. Many nursing students and teachers struggled with the new and unfamiliar format.^{9,11,14} Nursing students reported having less access to professors and classmates, issues with internet connectivity (which was particularly stressful in testing situations), and more distractions at home which were barriers to learning.⁹

Licensure examination testing was also affected by COVID-19. There were fewer National Council Licensure Examination (NCLEX) testing sites open due to the pandemic.¹⁵ In order to decrease the risk of infection for test takers, the maximum number of questions on the NCLEX-RN was reduced and the time limit for the exam was temporarily shortened from 6 hours to 4.¹⁶ Key informants also observed that the percent of people passing the NCLEX-RN declined during the pandemic (**Table 5**). Students reported that stress and a reduction in the number of questions hurt their scores once they were able to take the exam.¹²

TABLE 5. Number of NCLEX-RN Exams Administered to First-time Test Takers and Percent Passing (US Educated Only), 2018-2022

Degree	2018		2019		2020		2021		2022	
	N	%	N	%	N	%	N	%	N	%
RN	163,238	88%	171,387	88%	177,407	87%	182,062	82%	188,005	80%

Source: [National Council Licensure Examination \(NCLEX\) RN Examination Statistics](#).

There were higher rates of faculty attrition during the pandemic, exacerbating an existing issue. Reasons for increased attrition varied across programs, including faculty retirements, furloughs, budget cuts, and faculty leaving for better paying opportunities.

Adjusting to an online learning format was challenging, but most nursing students were able to graduate on time (**Table 6**). Programs relied more on simulation to teach important clinical skills. In addition, some programs modified their education requirements.^{11,17} For example, some classes shifted from using letter grades to pass/fail.¹⁷ Many nursing students also became involved in community care work during the pandemic.¹¹ These opportunities allowed the students to obtain valuable experience, receive course credit (for certain programs), and free up more experienced nurses for other tasks.

TABLE 6. Number of Nursing Degrees Awarded, 2017-2021^a

Degree	2017	2018	2019	2020	2021
RN	218,699	224,040	230,026	237,424	243,567

Source: [Integrated Postsecondary Education Data System \(IPEDS\) \(degrees/certificates awarded\)](#).

^a Does not include graduate level degrees.

The Long-term Impact of COVID-19

In one state, the pandemic served as a catalyst for the development of a centralized, statewide system for clinical placements, facilitating cooperation among educational programs. The transition from in-person to online learning environments also created opportunities for teachers and students to learn new educational tools (eg, Zoom) and strategies that have proved useful.

Students reported that online learning was more flexible and allowed them to have more control over their education. For example, they now had the ability to record lectures and listen to them at their convenience.⁹ The switch to online learning also led to the production and distribution of more electronic educational resources, such as instructional materials and information about specific diseases.¹⁷ Wallace et al. (2021) provided a variety of suggestions for improving online learning moving forward to capture its full educational potential:

- Utilize blended learning strategies to take advantage of the flexibility of online learning and the in-person experience of the classroom
- Use creative strategies to engage students when utilizing online formats such as:
 - Group discussion boards
 - Breakout rooms in online meetings
 - Assigning projects that require collaboration

While the pandemic led to some innovations, it also exacerbated existing issues. Key informants indicated that the pandemic increased existing faculty vacancies. The nursing faculty vacancy rates increased from 6.5% in 2020 to 8% in 2021 according to the American Association of Colleges of Nursing.¹⁸ Key informants reported concern that the disparity between academic and clinical salaries continues to make it difficult for RN education programs to compete with other employers.

CONCLUSION

The COVID-19 pandemic had a substantial impact on medical and RN education. At the beginning of the pandemic, medical and RN education programs experienced disruptions to clinical training and they were forced to abruptly shift from in-person classes to online learning environments. Overall, RN education programs were more impacted than medical education programs according to key informants. Faculty retention was already an issue for RN programs, and it worsened during the pandemic. In addition, NCLEX pass rates for RNs declined in 2021 and 2022. Despite the challenges caused by COVID-19, most medical and nursing students graduated on time. The pandemic also led to some permanent changes. Medical and RN education programs discovered that there were some advantages to the flexibility of the virtual learning environment and programs continue to use some of these strategies. But more research is needed to fully understand the long-term impact of COVID-19 on the nation's health professions education pipeline.

REFERENCES

1. Akers A, Blough C, Iyer MS. COVID-19 implications on clinical clerkships and the residency application process for medical students. *Cureus*. 2020;12(4):e7800. doi:10.7759/cureus.7800.
2. Aiyer AA, Granger CJ, McCormick KL, et al. The impact of COVID-19 on the orthopaedic surgery residency application process. *J Am Acad Orthop Surg*. Published online May 28, 2020. doi:10.5435/JAAOS-D-20-00557.
3. Blankenburg R, Gonzalez del Rey J, Aylor M, et al. The impact of the COVID-19 pandemic on pediatric graduate medical education: Lessons learned and pathways forward. *Acad Med*. 2022;97(3):S35-S39. doi:10.1097/ACM.0000000000004532.
4. Edigin E, Eseaton PO, Shaka H, Ojemolon PE, Asemota IR, Akuna E. Impact of COVID-19 pandemic on medical postgraduate training in the United States. *Med Educ Online*. 2020;25(1):1774318. doi:10.1080/10872981.2020.1774318.
5. Jones VA, Clark KA, Puyana C, Tsoukas MM. Rescuing medical education in times of COVID-19. *Clin Dermatol*. 2021;39(1):33-40. doi:10.1016/j.clindermatol.2020.12.010.
6. Rose S. Medical student education in the time of COVID-19. *JAMA*. 2020;323(21):2131-2132. doi:10.1001/jama.2020.5227.
7. Ferrel MN, Ryan JJ. The impact of COVID-19 on medical education. *Cureus*. 2020;12(3):e7492. doi:10.7759/cureus.7492.
8. Kaul V, Gallo de Moraes A, Khateeb D, et al. Medical education during the COVID-19 pandemic. *Chest*. 2021;159(5):1949-1960. doi:10.1016/j.chest.2020.12.026.
9. Wallace S, Schuler MS, Kaulback M, Hunt K, Baker M. Nursing student experiences of remote learning during the COVID-19 pandemic. *Nurs Forum (Auckl)*. 2021;56(3):612-618. doi:10.1111/nuf.12568.
10. Walters M, Alonge T, Zeller M. Impact of COVID-19 on medical education: Perspectives from students. *Acad Med*. 2022;97(3):S40-S48. doi:10.1097/ACM.0000000000004525.
11. Chan GK, Bitton JR, Allgeyer RL, Elliott D, Hudson LR, Moulton Burwell P. The impact of COVID-19 on the nursing workforce: A national overview. *Online J Issues Nurs*. 2021;26(2):Manuscript 2. doi:10.3912/OJIN.Vol26No02Man02.
12. Cox RS. *Perceived Impact of the COVID-19 Pandemic on the Development of Emotional Intelligence and Critical Thinking Skills Among Nursing Graduates and Their Success on the NCLEX Nursing Licensure Exam*. Ed.D. Indiana Wesleyan University; 2022. Accessed November 10, 2022. <https://www.proquest.com/docview/2708782496/abstract/BC321B0507E243D0PQ/1>
13. Blevins S. The impact of COVID-19 on nursing education. *MEDSURG Nurs*. 2021;30(2):145-146.
14. Singh A, Haynes M. The challenges of COVID-19 in nursing education: The time for faculty leadership training is now. *Nurse Educ Pract*. 2020;47:102831. doi:10.1016/j.nepr.2020.102831.
15. Armstrong D, Moore J, Moore D, Ziemann M, Strasser J, Westfall N, Krips M. State Responses to Address Workforce Needs in the Initial Wave of the Pandemic. Rensselaer, NY: Health Workforce Technical Assistance Center, Center for Health Workforce Studies, School of Public Health, SUNY Albany; March 2021. https://www.chwsny.org/wp-content/uploads/2021/03/HWTAC_State-Responses-to-Address-Workforce-Needs-in-the-Initial-Wave-of-the-Pandemic_2021_FINAL.pdf
16. Jenkins D. NCLEX Changes Effective Oct. 1st, 2020. The Nurse Speak website. Published September 9, 2020. Accessed March 30, 2023. <https://thenursespeak.com/nclex-changes-effective-oct-1st-2020/>
17. Beauvais A, Kazer M, Rebesch LM, Baker R, Lupinacci JH. Educating nursing students through the pandemic: The essentials of collaboration. *SAGE Open Nurs*. Published online December 8, 2021. doi:10.1177/23779608211062678.
18. Data Spotlight: Insights on the Nursing Faculty Shortage. American Association of Colleges of Nursing website. Published August 17, 2021. Accessed February 16, 2023. <https://www.aacnursing.org/News-Information/News/View/ArticleId/25043/data-spotlight-august-2021-Nursing-Faculty-Shortage>

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