

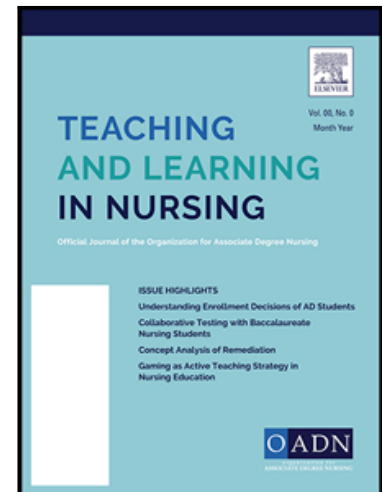


Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Journal Pre-proof

How Has the Covid-19 Pandemic Influenced Nursing Students' Academic Experience and Career Choices? A Qualitative Descriptive Analysis



Masamitsu Kobayashi PhD, RN, OCNS ,
Yuji Koga PhD, RN, CCNS , Jun Kako PhD, RN, OCNS ,
Takahiro Kakeda PhD, RN , Hana Kiyohara MSN, RN ,
Yasutaka Kimura PhD, RN, OCNS , Michiko Ishida PhD, RN ,
Michihiro Tsubaki PhD, RN , Yoko Nishida MSN, RN ,
Kimie Harada MSN, RN , Yuki Wakiguchi MSN, RN, OCNS ,
Yoji Endo MSN, RN , Yoshiyasu Ito MA, RN ,
Shinsuke Sasaki PhD, RN , Kohei Kajiwara PhD, RN ,
Seiji Hamanishi PhD, RN , Makoto Yamanaka PhD, RN

PII: S1557-3087(22)00132-9
DOI: <https://doi.org/10.1016/j.teln.2022.10.009>
Reference: TELN 982

To appear in: *Teaching and Learning in Nursing*

Accepted date: 30 October 2022

Please cite this article as: Masamitsu Kobayashi PhD, RN, OCNS , Yuji Koga PhD, RN, CCNS , Jun Kako PhD, RN, OCNS , Takahiro Kakeda PhD, RN , Hana Kiyohara MSN, RN , Yasutaka Kimura PhD, RN, OCNS , Michiko Ishida PhD, RN , Michihiro Tsubaki PhD, RN , Yoko Nishida MSN, RN , Kimie Harada MSN, RN , Yuki Wakiguchi MSN, RN, OCNS , Yoji Endo MSN, RN , Yoshiyasu Ito MA, RN , Shinsuke Sasaki PhD, RN , Kohei Kajiwara PhD, RN , Seiji Hamanishi PhD, RN , Makoto Yamanaka PhD, RN , How Has the Covid-19 Pandemic Influenced Nursing Students' Academic Experience and Career Choices? A Qualitative Descriptive Analysis, *Teaching and Learning in Nursing* (2022), doi: <https://doi.org/10.1016/j.teln.2022.10.009>

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2022 Published by Elsevier Inc. on behalf of Organization for Associate Degree Nursing.

Research

HOW HAS THE COVID-19 PANDEMIC INFLUENCED NURSING STUDENTS' ACADEMIC EXPERIENCE AND CAREER CHOICES? A QUALITATIVE DESCRIPTIVE ANALYSIS

Authors: Masamitsu Kobayashi^a, PhD, RN, OCNS; Yuji Koga^b, PhD, RN, CCNS; Jun Kako^c, PhD, RN, OCNS; Takahiro Kakeda^d, PhD, RN; Hana Kiyohara^c, MSN, RN; Yasutaka Kimura^e, PhD, RN, OCNS; Michiko Ishida^b, PhD, RN; Michihiro Tsubaki^f, PhD, RN; Yoko Nishida^b, MSN, RN; Kimie Harada^g, MSN, RN; Yuki Wakiguchi^c, MSN, RN, OCNS; Yoji Endo^d, MSN, RN; Yoshiyasu Ito^c, MA, RN; Shinsuke Sasaki^h, PhD, RN; Kohei Kajiwara^g, PhD, RN; Seiji Hamanishi^d, PhD, RN; Makoto Yamanakaⁱ, PhD, RN

Affiliations:

^a *Graduate School of Nursing Science, St. Luke's International University, Chuo-ku, 104-0044, Japan*

^b *Faculty of Nursing, Kawasaki University of Medical Welfare, Kurashiki, 701-0193 Japan*

^c *College of Nursing Art and Science, University of Hyogo, Akashi, 673-8588 Japan*

^d *Faculty of Nursing, Kansai University of Social Welfare, Ako, 678-0255 Japan*

^e *Department of Nursing, Meio University, Nago, 905-8585 Japan*

^f *School of Nursing, Kitasato University, Sagamihara, 252-0329 Japan*

^g *Japanese Red Cross Kyushu International College of Nursing, Munakata, 811-4157 Japan*

^h *Department of Nursing Science, Okayama Prefectural University, Soja, 719-1197 Japan*

ⁱ *School of Nursing, Aichi Medical University, Nagakute, 480-1195 Japan*

Corresponding author:

Prof. Masamitsu Kobayashi, *PhD, RN, OCNS*

Graduate School of Nursing Science, St. Luke's International University,

10-1 Akashi-cho, Chuo-ku, Tokyo, 104-0044, Japan

Phone: +81-3-3543-6391

E-mail: masamitsu4k26@gmail.com

Manuscript type

Research Paper

Page count: 15 pages

No. of tables/figures/references/ Supplementary Table: 0/0/30/1

Declarations of interest: None

Acknowledgements

We thank Editage (www.editage.jp) for English-language editing.

Highlights

- The COVID-19 pandemic impacted nursing students' academic experience and career.
- Semi-structured interviews were conducted with 14 nursing students.
- Nursing students need psychological support, employment information, and feedback.

Abstract

COVID-19 control measures influenced education and training environments and profoundly impacted nursing students' career prospects and academic lives. This study intends to elucidate the impact of the COVID-19 pandemic on nursing students' academic experience and career choices. A qualitative descriptive study was conducted at a four-year university in Japan, using semi-structured interviews with 14 nursing students. Sandelowski's qualitative descriptive analysis was conducted. We identified 11 categories that summarize COVID-19's influence on students' academic experience and career choices: "Forced change to a new learning system," "Difficult learning thoroughly with

restricted face-to-face interactions,” “Worries regarding teacher evaluations when face-to-face interactions are restricted,” “Adapting to changes in the learning environment,” “Finding new ways to learn due to the different learning environment,” “Worries regarding career decision-making after losing opportunities to obtain career information”, “Fully utilizing limited information resources in deciding where to work while being influenced by others,” “Coping with a confusing new job hunting system,” “Worries about becoming a nurse without enough practical experience,” “Conscious of working as a nurse while facing infections,” and “Support from those around me is helpful in an unfamiliar environment.” The categories comprised four elements: academic impact, employment/career impact, future impact on working as a nurse, and environmental support. Building an online education/training program, ensuring the availability of regular psychological support, providing abundant information on employment, installing an information desk, and providing regular feedback were considered imperative for supporting nursing students.

Keywords: academic, COVID-19, future career, experience, nursing student, qualitative study

1. INTRODUCTION

The coronavirus disease (COVID-19) emerged in Wuhan, China, in December 2019 and spread worldwide (Wang et al., 2020). On March 11, 2020, the World Health Organization declared a pandemic, leading to travel restrictions, social distancing, and quarantine measures, which had varied socio-economic and educational effects. With more than 1.7 million cumulative infections as of December 2021 (World Health Organization, 2021), any affected region in Japan was declared to be in a “quasi-state of emergency” or “state of emergency,” requiring even stricter infection control measures (Cabinet Secretariat [Japan], 2021).

Globally, the pandemic’s spread has considerably impacted mental health (Vindegaard & Benros, 2020), with a high prevalence of anxiety, depression, insomnia, and stress among workers, particularly healthcare professionals (Vizheh et al., 2020) and students. Nursing students are experiencing pandemic-related adverse mental health effects, including anxiety, stress, and fatigue (Mulyadi et al., 2021). Furthermore, deteriorating mental health is associated with obstacles to nursing students’ learning and negative feelings about becoming nurses (Cici & Yilmazel, 2021; Turner & McCarthy, 2017).

Nursing students have been forced to change to remote learning, and clinical education has been cancelled or changed because of infection control policies (Cabinet Secretariat [Japan], 2021). Although online learning is reportedly useful in nursing education (McCutcheon et al., 2015), sudden and unexpected

changes to learning methods without proper infrastructure and learning systems may be less effective (Radu et al., 2020). As clinical education is extremely important for acquiring practical nursing skills, cancellation or modifications to clinical education may lead to students harboring negative feelings (Ramos-Morcillo et al., 2020). Additionally, attending university helps nursing students connect with classmates and teachers; losing this opportunity may be detrimental (Radu et al., 2020; Usher et al., 2020). Nursing students also acquire knowledge about hospital systems and information that facilitates career choices by attending hospital-sponsored internships and hospital briefings (Ooi et al., 2009; Park & Ko, 2016), which are limited due to the pandemic.

Therefore, the COVID-19 pandemic is evidently impacting nursing students' academic experiences and career choices. Thus, this study aimed to gain insight into nursing students' individual experiences, clarify the pandemic's impact on their academic experience and career paths, and identify their foremost psychological and employment support needs.

2. METHODS

2.1. Study design and participants

We employed a qualitative and descriptive study design because there is a lack of qualitative research on the investigated topic. The COREQ (COnsolidated criteria for REporting Qualitative research) checklist (Tong et al., 2007) was used for reporting. The inclusion criteria were: (1) being a nursing

student in a Japanese four-year university, (2) being in the program's final year, and (3), having experience with job search activities. There were no limitations of age or gender or exclusion criteria. Semi-structured interviews were conducted from August 1 through October 31, 2021.

2.2. Data collection

Participants were selected using snowball sampling wherein researchers introduced students attending their affiliated university to the interviewer, but the researcher(s) had no involvement in the subsequent interview.

The study briefing session included a written document; return of the document implied consent to be interviewed. Thereafter, participants scheduled their interview according to their convenience. Considering COVID-19 infection control measures, all processes—including the briefing, consent confirmation, and study implementation—were available online upon request. For those who participated online, documents were exchanged via mail, or the data were scanned.

Interviews were semi-structured based on researcher-created interview guides. Due to COVID-19 measures, individual interviews (30–60 min each) were conducted online. With participants' permission, interviews were recorded with an IC recorder and transcribed verbatim. Interviews were conducted by YK, HK, YK, MI, YN, and KH. None of the participants refused to participate.

The sample size was determined by data saturation and by the number of participants required to assure result validity (Creswell, 2007).

2.3. Interview contents

The interview questions were designed by the researchers, and the interview questions were refined by pre-interviewing three students. The items asked in the semi-structured interview comprised two components: participants' basic information and COVID-19's impact on their academic experience and future career paths. The impact on academics was explored through questions regarding learning methods, such as class format and changes in on-site education sites and teachers, as well as participants' frequency of commuting to school, knowledge and skills, and the physical and mental strain experienced by them. The impact on career paths was assessed through items related to career choices, such as changes in job placement, further education, and interest in new career opportunities, as well as changes in the support system that was needed to make career choices. Examples of questions include "How has the COVID-19 pandemic affected your academic career?", "What have been some of the physical and emotional challenges in your academic career as a result of the COVID-19 pandemic?", and "How has the COVID-19 pandemic affected your future career path?"

2.4. Analysis method

Data coding was mainly conducted by MK, and six researchers with extensive qualitative research experience were consulted to ensure study reliability and validity. By referring to Sandelowski's (2000) technique, we consciously provided frank descriptions (detailed, comprehensive, and accurate) of each phenomenon. For analysis, we repeatedly and carefully read each participant's verbatim interview transcript to ensure we fully understood the contents. Next, we extracted sentences reflecting "the COVID-19 pandemic's influence on nursing students' academic experiences and future career choices" while reading the content before and after each of those sentences for use as raw data. This content was expressed as a single sentence to avoid losing the meaning in the raw data and was then coded. Next, codes with similar meanings were grouped; those with common meanings were summarized into single sentences as subcategories and subcategories with similar meanings were grouped, and those with common meanings were expressed as single-sentence categories. Throughout, we considered relationships between the generated categories of "COVID-19's impact on nursing students' academic experience and future career choices," which were then further classified into the main elements of that topic. The process employed NVivo 12 software.

2.5. Ethical considerations

This study was approved by the relevant institutional review board.

Participants were informed in writing and orally that participation was entirely

voluntary, and they could refuse participation or withdraw early without consequences. Their privacy and anonymity were protected, and ample consideration was given to their psychological and physical state before seeking signed consent. All interviews were anonymized for encoding, analysis, and results presentation and numerically labeled in chronological order according to interview dates preceded by the letter S (student).

3. RESULTS

3.1. Participant characteristics and analysis results

The study participants included 14 students. Twelve participants were female with an age range of 21–23 years. The mean interview duration was 37.9 (29–77) mins. Analysis of COVID-19's impact on the participants' academic experience and career choices revealed 325 codes, 50 subcategories, and 11 categories (Supplementary Table 1).

3.2. COVID-19 pandemic: Impact on students' academic experience and future career choices

3.2.1. Academic impact

3.2.1.1. Forced change to a new learning system

Due to COVID-19, all nursing students experienced changing from conventional face-to-face lessons to an unfamiliar online format or replacing practical clinical education with online learning.

I was worried during the first month of the pandemic when lectures were not taking place and when the unfamiliar online classes started. (S13)

The biggest impact on nursing skills was due to some of the clinical education sessions being conducted online, and in some situations, classes were also conducted online as more people became sick. (S5)

3.2.1.2. Difficulty learning thoroughly in an environment with restricted face-to-face interactions

Thirteen students believed that in a learning environment where face-to-face contact was restricted due to COVID-19 and students and teachers had no interaction, they were deprived of learning opportunities. They also reported difficulties managing their time and maintaining motivation and focus while studying alone at home.

Face-to-face lessons provide an inspiring and focused environment, but I cannot focus during online classes, especially with the camera being off. (S14)

Studying with friends and classmates was part of normal university life, but as COVID-19 forces me to study alone, my grades have dropped. (S9)

Furthermore, half of the students had difficulties actively participating in online lessons. They were reluctant to make comments or ask questions; thus, a lesson would often proceed before their doubts were resolved.

Unlike face-to-face lessons, my classmates were extremely reluctant to speak during online group work, which made things difficult. (S3)

It is difficult to get in touch with the teacher after an online lesson, so I was left with an unclear understanding of the lesson contents because I couldn't resolve my doubts. (S11)

Six students experienced physical and mental distress, such as headaches and fatigue, from facing a computer screen all day and found it difficult to progress in the restricted learning environment.

There were times when I was looking at the PC screen all day, which gave me headaches and made me feel tired. (S3)

3.2.1.3. Worries regarding teacher evaluations when face-to-face interactions are restricted

Two students were worried that because coursework for online lessons solely comprised submitted materials, they were being evaluated based on those alone. Furthermore, because they had to use an unfamiliar online attendance registration system, they worried that unintentional “absent” registrations might affect their acquisition of credits.

I am worried that the grades will be based solely on the coursework. (S2)

3.2.1.4. Adapting to changes in the learning environment

Seven students made special efforts to adapt to the changing learning environment, such as organizing the online work environment, finding ways to make the learning process smoother, and doing extra work when they believed they had not learned enough.

I arranged my online work environment after the lessons went online because, until then, I finished my reports at school or in the library. (S3)

I took the initiative to contact the university teaching staff to check with them about the practicum work that would be missed as a result of the practical sessions being cancelled. (S1)

I asked students from the practicum group of the lab I was about to go to about the COVID-19 restrictions that were in place at the fieldwork site and what the environment was like. (S8)

3.2.1.5. Finding new ways to learn due to the different learning environment

Five students acquired new skills through the frequent use of online lesson systems and the computer, with which they had minimal previous experience.

They also reviewed their self-learning strategies to effectively use the newly-available time from not having to commute to the university.

With libraries closed, the university provided us access to the Japan Medical Abstracts Society Web (literature search database); hence, we could refer online papers rather than books to write reports. (S3)

With the pandemic preventing me from commuting to school and with me still waking up at the same time, I've been studying a little more during the time made available and learning about respiratory problems using apps. (S2)

Three students believed on-campus learning afforded them time to think, deepening their understanding of what they were learning.

On-campus learning involved us students splitting into patient and nurse roles to perform role-playing, and we could search the answers to any questions we had in that situation, which makes me feel like I've acquired study skills. (S14)

3.2.2. Employment/career impact

3.2.2.1. Worries regarding career decision-making after losing opportunities to obtain career information

Eight students were worried about career decision-making. As their opportunities for clinical education were restricted, there were fewer

opportunities to participate in hospital tours, and they either did not have access to information to help them choose a hospital where they would want to work, or they could not find a nursing field that interested them.

I could not visit hospitals because of the pandemic, and I would have liked to have seen the hospitals directly and done a few internships before choosing my path. (S8)

As I wasn't able to attend most practical sessions and could not observe how nurses work, I couldn't really imagine the field of nursing that interests me the most, and I find it difficult to think about my future career path. (S9)

3.2.2.2. Fully utilizing limited informational resources in deciding where to work while being influenced by others

Ten students actively gathered employment information, thus obtaining employment-related information about hospitals online because of pandemic-related difficulties.

Since I wasn't able to directly participate in the hospital tours because of the pandemic, I participated in an online hospital briefing session conducted by a private company. (S1)

Based on advice of friends and family, three students avoided seeking employment in regions with high COVID-19 contagion levels because of their

concerns about working in such areas and in hospitals actively accepting COVID-19 patients.

When discussing where to work, my parents asked me not to go to the capital area, where several COVID-19 infections have been detected; I considered their request and avoided places with high contagion levels. (S13)

3.2.2.3. Coping with a confusing new job hunting system

Eight students had difficulty coping with job hunting, which changed to an online format. They had to navigate through an unfamiliar online environment despite their confusion.

During job hunting, in online interviews, I was worried because I was unsure whether my opinion was being conveyed. (S11)

My in-person interview was suddenly changed to an online interview because of COVID-19. I had only practiced for an in-person interview, and I wasn't aware that you need to prepare looking at the camera and the camera angle, so I was a bit flustered having to adjust these things all over again. (S13)

3.2.3. Future impact on working as a nurse

3.2.3.1. Worries regarding becoming a nurse without enough practical experience

Twelve students reported that they could not gain practical nursing knowledge and skills because practicum lessons and lectures were canceled. They were worried about whether they could work as nurses with such little practical experience.

I am worried about working as a nurse because I have not sufficiently understood how to interact and communicate with patients and how hospitals work. (S11)

Furthermore, three students, who regarded themselves as belonging to the “Corona generation,” were worried about colleagues in the workplace considering them useless because of having few nursing skills due to being from the “Corona generation” with limited practical nursing experience.

I would like to do my best as a nurse after I get a job, but it hurts me to be seen as someone with low work ability because I belong to the Corona generation. (S6)

3.2.3.2. Conscious of working as a nurse while facing infections

Six students described receiving COVID-19-related health advice from those around them and being more conscious of their future work as a nurse because of the pandemic; for instance, they became more aware of the importance of a nurse’s role in the COVID-19 pandemic.

While society is struggling with the COVID-19 pandemic, when considering my career path, going to a site where I am needed as

a nurse is one of the things I want to do, so I think it is good.

(S10)

Four students were trying to take precautions to prevent the spread of the infection as part of their responsibility as future nurses.

3.2.4. Environmental support

3.2.4.1. Support from those around me is helpful in an unfamiliar environment

Ten students felt supported by sharing their feelings with classmates about COVID-19's impact on school and future career choices.

I was working hard on my academic work and encouraged my classmates to work hard collectively to overcome the predicament of the COVID-19 pandemic. Sharing painful feelings with others made me feel lighter and more positive. (S4)

Conversely, three students mentioned struggling as the pandemic reduced opportunities to meet directly with classmates and teachers to discuss their concerns about academic work and future career choices.

Speaking to my classmates and teachers about employment has been difficult, and I have been worried that I am on my own as I face job hunting. (S7)

4. DISCUSSION

This study aimed to understand the personal experiences of nursing students enrolled in the final year of a four-year Japanese university program to determine the impact of the COVID-19 pandemic on their academic and career paths. Participants attended universities in regions where emergency or quasi-states of emergency were declared. Therefore, all participants were likely to have been substantially affected by the pandemic.

4.1. COVID-19's impact on academic experience and future career choices

4.1.1. Academic impact

Participants were forced to shift their learning system to online lectures and practical sessions. Globally, the rapid shift to online education has obstructed learning due to having to develop the necessary digital technology skills and infrastructure, such as available internet connectivity and digital devices (Radu et al., 2020).

Furthermore, in a learning environment devoid of face-to-face interaction, participants experienced learning-related difficulties and worried about their teachers' evaluations. Previous studies have reported that the switch to online learning reduced nursing students' motivation and focus; and caused time-management difficulties, uncertainties regarding coursework evaluation, and disappointment in losing opportunities to learn with classmates (Ramos-Morcillo et al., 2020; Rasmussen et al., 2022). Our participants experienced similar changes, thus deteriorating their learning ability. Thus, a systematic online

learning program is needed. Active learning, two-way active conversation, observing role-play, and receiving open and prompt support can help alleviate students' anxiety and increase their motivation to learn and focus (Dorrian & Wache, 2009; Jowsey et al., 2020). Additionally, mental health deterioration impedes learning in nursing students (Cici & Yilmazel, 2021; Turner & McCarthy, 2017). Therefore, addressing nursing students' mental health status and providing psychological support is necessary. Students could be screened through regular mental health checks, and psychological support could be provided by a resident counselor.

Some nursing students, however, had positive experiences, such as discovering new ways to learn by adapting to learning environment changes (or to completely different learning environments). Previous studies on nursing students have also reported that learning methods can improve, and new learning strategies can be derived through adaptation to the enforced new learning environment (Rasmussen et al., 2022). Additionally, this previous study reported that students' resilience improved in the face of pandemic-related difficulties and stress. Thus, promoting adaptation to the learning environment and flexibility with learning methods is crucial.

4.1.2. Employment/career impact

The COVID-19 pandemic caused the loss of opportunities in obtaining career information and confusion regarding career decisions. Internships and briefing

sessions hosted by hospitals provide detailed information about the hospital system and are an important source of career choice information. However, due to each hospital's policy regarding the acceptance of COVID-19 patients and concerns about infection spread, many hospitals tended to cancel or scale down the hosting of such events (Japan Association of Nursing Programs in Universities, 2022). This limited the sources of information related to career prospects for participants, leading to struggles in making career decisions. Conversely, some participants gathered diverse information from online sources to make career choice decisions. Therefore, advice and information from students' surroundings are helpful. Providing accurate information to students and connecting them with companies that provide online job-hunting support would be useful for supporting students' career decisions.

Furthermore, despite initial confusion, participants coped with the new job hunting system. Traditional face-to-face job hunting was shifted online by many hospitals owing to the pandemic (Cabinet Secretariat [Japan], 2022). Thus, students, particularly infrequent Internet users, needed an internet environment, prepared infrastructure (e.g., digital equipment), and digital skills. A lack of these may have impeded some students' success during job hunting. Therefore, providing additional support by setting up a consultation desk or renting out online devices may improve students' ability to prepare for job hunting.

4.1.3. Impact on working as a nurse in the future

Participants experienced anxiety about obtaining insufficient practical nursing experience. Studies suggest that without ample opportunities for clinical work, nursing students believed they did not acquire enough skills and tended to feel underprepared and lacked confidence (Ramos-Morcillo et al., 2020; Rasmussen et al., 2022); our participants reported similar experiences. Clinical education is crucial to gain practical nursing skills; hence, cancellation or shortening of it can substantially impact learning practical skills. Therefore, during pandemics, initiatives to solve these issues are needed. Specifically, highly accurate simulated learning and education utilizing virtual reality to improve practical nursing abilities may substitute clinical education (Foronda et al., 2020).

Furthermore, participants were conscious about contracting infections, as shown by their awareness of infection prevention measures. Many nursing students, even during the pandemic, viewed the nursing profession positively (Bahçecioğlu Turan et al., 2021); our participants had similar experiences possibly because the motivation to work as healthcare professionals arises from occupational, ethical, and moral values (Martin-Delgado et al., 2021). During the COVID-19 pandemic, nurses assumed great responsibility and faced a high risk of infection; the image of nurses struggling at the frontline inspired nursing students (Canet-Vélez et al., 2021). Participants had positive feelings toward nurses as well as anxiety about being labelled as the “Corona generation,”

implying they were psychologically ambivalent. Since increased anxiety during the COVID-19 pandemic adversely affects nursing students' professional identities (Sun et al., 2020), it is important to provide support for managing anxiety.

4.1.4. Environmental support

Nursing students were supported by those around them regarding academic work and career choices while coping in an unfamiliar environment. The COVID-19 pandemic has led to people having limited interactions, which can lead to adverse psychological effects, such as social isolation and loneliness (Rauschenberg et al., 2021). Hence, it is important for nursing students to interact with their classmates and teachers. Regular feedback from teachers over time motivates students to learn (Zepke et al., 2010). Therefore, frequent feedback from teachers must be promoted as an important source of support for nursing students wherein interaction with others is restricted.

4.2. Limitations

Despite the insights provided by this study, there are some limitations. First, the effects of the COVID-19 pandemic are strongly influenced by national infection control measures and cultural backgrounds; therefore, care must be taken when interpreting the study results. Second, because we used snowballing recruitment to enlist participants, we cannot rule out bias in the data.

Specifically, the data may be affected by individual student characteristics.

Third, participants were from three facilities in a limited area, and the data may be limited due to region- and facility-related characteristics. Further studies must be conducted with expanded target areas and facilities; quantitative research should also be considered.

5. CONCLUSIONS

COVID-19's impact on nursing students' academic work and career choices involved four elements: academic impact, employment and career impact, future work as a nurse, and environmental support. Concerning academics, many students found it difficult to gain a deep understanding of what they were learning; they worried about how the teaching staff would evaluate them in an environment with restricted face-to-face interactions. However, others discovered new ways to learn by adapting to the changing or entirely different learning environment. Regarding employment and career, despite being troubled with making decisions about career paths due to a lack of related information, students fully utilized the limited sources and available information. Although their surroundings influenced this effort, they also independently decided where to work. Furthermore, despite the confusion from a modified job hunting system, they attempted to cope. Despite anxiety about their future work as nurses due to concerns of insufficient practical nursing experience, students developed greater consciousness of working as nurses in the future while facing infections.

Additionally, they realized that people around them can be sources of support, even if they are in an unfamiliar environment. Building an online learning program, providing regular psychological support, offering abundant information about employment, establishing a consultation desk, and providing students with regular feedback are important elements of support for nursing students.

Author contributions

Conceptualization, Methodology: **All authors**; Validation: **Masamitsu Kobayashi, Yuji Koga, Jun Kako, Yasutaka Kimura, Michiko Ishida, Michihiro Tsubaki, Yoko Nishida**; Formal analysis, Data curation, Writing- Original draft preparation, Visualization: **Masamitsu Kobayashi**; Investigation: **Masamitsu Kobayashi, Yuji Koga, Jun Kako, Hana Kiyohara, Yasutaka Kimura, Michiko Ishida, Yoko Nishida, Kimie Harada, Yoshiyasu Ito, Shinsuke Sasaki**; Resources: **Jun Kako, Yasutaka Kimura, Yoshiyasu Ito, Shinsuke Sasaki**; Writing- Reviewing and Editing: **All authors**; Supervision, Project administration: **Masamitsu Kobayashi, Yuji Koga, Jun Kako, Takahiro Kakeda**; Funding acquisition: **Jun Kako**

Ethical Approval

This study was approved by the Institutional Review Board of the Research Ethics committee, College of Nursing Art & Science and Research Institute of Nursing Care for People and Community, University of Hyogo, Japan (approval no.: 2020F29, approval date: 3 March 2021).

Funding sources

This work was supported by the Promotion Project of The Next Generation Study, Post-Corona Field. The funding source had no involvement in the study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication.

References

Bahçecioğlu Turan, G., Özer, Z., & Çiftçi, B. (2021). Analysis of anxiety levels and attitudes of nursing students toward the nursing profession during the COVID- 19 pandemic. *Perspectives in Psychiatric Care*, 57, 1913–1921. <https://doi.org/10.1111/ppc.12766>.

Cabinet Secretariat (Japan). COVID-19 information and resources page. Measures to be taken based on the basic response. (2021). <https://corona.go.jp/emergency/> Accessed 12 January 2022.

Cabinet Secretariat (Japan). Requests for employment and recruitment activities for those who are planning to graduate or complete studies in 2021. Taking into consideration the novel coronavirus infection control measures. (2022). https://www.cas.go.jp/jp/seisaku/shushoku_katsudou_yousei/2021nendosotu/corona_yousei.html Accessed 12 January 2022.

Canet-Vélez, O., Botigué, T., Santamaría, A. L., Masot, O., Cemeli, T., & Roca, J. (2021). The perception of training and professional development according to nursing students as health workers during COVID-19: A qualitative study. *Nurse Education in Practice*, 53, 103072. <https://doi.org/10.1016/j.nepr.2021.103072>.

Cici, R., & Yilmazel, G. (2021). Determination of anxiety levels and perspectives on the nursing profession among candidate nurses with relation to the COVID- 19 pandemic. *Perspectives in Psychiatric Care*,

57, 358–362. <https://doi.org/10.1111/ppc.12601>.

Creswell, J.W. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. Sage Publications.

Dorrian, J., & Wache, D. (2009). Introduction of an online approach to flexible learning for on-campus and distance education students: Lessons learned and ways forward. *Nurse Education Today*, 29, 157–167. <https://doi.org/10.1016/j.nedt.2008.08.010>.

Foronda, C. L., Fernandez-Burgos, M., Nadeau, C., Kelley, C. N., & Henry, M. N. (2020). Virtual simulation in nursing education: A systematic review spanning 1996 to 2018. *Simulation in Healthcare*, 15, 46–54. <https://doi.org/10.1097/SIH.0000000000000411>.

Japan Association of Nursing Programs in Universities. Survey results on the impact of the spread of the novel coronavirus on nursing universities and how to deal with it (2nd ed.). (2022). <https://www.janpu.or.jp/wp/wp-content/uploads/2020/04/coronavirus-cyousakekka2nd.pdf> Accessed 12 January 2022.

Jowsey, T., Foster, G., Cooper-Ioelu, P., & Jacobs, S. (2020). Blended learning via distance in pre-registration nursing education: A scoping review. *Nurse Education in Practice*, 44, 102775. <https://doi.org/10.1016/j.nepr.2020.102775>.

Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R., Tan, H., Kang, L., Yao, L., Huang, M., Wang, H., Wang, G., Liu, Z.,

- & Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Network Open*, 3, e203976. <https://doi.org/10.1001/jamanetworkopen.2020.3976>.
- Martin-Delgado, L., Goni-Fuste, B., Alfonso-Arias, C., De Juan, M., Wennberg, L., Rodríguez, E., Fuster, P., Monforte-Royo, C., & Martin-Ferreres, M. L. (2021). Nursing students on the frontline: Impact and personal and professional gains of joining the health care workforce during the COVID-19 pandemic in Spain. *Journal of Professional Nursing*, 37, 588–597. <https://doi.org/10.1016/j.profnurs.2021.02.008>.
- McCutcheon, K., Lohan, M., Traynor, M., & Martin, D. (2015). A systematic review evaluating the impact of online or blended learning vs. face-to-face learning of clinical skills in undergraduate nurse education. *Journal of Advanced Nursing*, 71, 255–270. <https://doi.org/10.1111/jan.12509>.
- Mulyadi, M., Tonapa, S. I., Luneto, S., Lin, W. T., & Lee, B. O. (2021). Prevalence of mental health problems and sleep disturbances in nursing students during the COVID-19 pandemic: A systematic review and meta-analysis. *Nurse Education in Practice*, 57, 103228. <https://doi.org/10.1016/j.nepr.2021.103228>.
- Ooi, C., Funashima, N., & Kameoka, T. (2009). Nursing students' choice of hospitals for their first job as a nurse: A survey on nurses who have more than one year experience in one hospital. *Journal of Japan Academy of Nursing Education*. 18, 7–20. https://doi.org/10.19015/jasne.18.1_7.

- Park, B. H., & Ko, Y. (2016). Hospital preferences of nursing students in Korea: A discrete choice experiment approach. *Human Resources for Health, 14*, 58. <https://doi.org/10.1186/s12960-016-0156-1>.
- Radu, M. C., Schnakovszky, C., Herghelegiu, E., Ciubotariu, V. A., & Cristea, I. (2020). The impact of the COVID-19 pandemic on the quality of educational process: A student survey. *International Journal of Environmental Research and Public Health, 17*, 7770. <https://doi.org/10.3390/ijerph17217770>.
- Ramos-Morcillo, A. J., Leal-Costa, C., Moral-García, J. E., & Ruzafa-Martínez, M. (2020). Experiences of nursing students during the abrupt change from face-to-face to e-learning education during the first month of confinement due to COVID-19 in Spain. *International Journal of Environmental Research and Public Health, 17*, 5519. <https://doi.org/10.3390/ijerph17155519>.
- Rasmussen, B., Hutchinson, A., Lowe, G., Wynter, K., Redley, B., Holton, S., Manias, E., Phillips, N., McDonall, J., McTier, L., & Kerr, D. (2022). The impact of Covid-19 on psychosocial well-being and learning for Australian nursing and midwifery undergraduate students: A cross-sectional survey. *Nurse Education in Practice, 58*, 103275. <https://doi.org/10.1016/j.nepr.2021.103275>.
- Rauschenberg, C., Schick, A., Goetzl, C., Roehr, S., Riedel-Heller, S.G., Koppe, G., Durstewitz, D., Krumm, S., & Reininghaus, U. (2021). Social

isolation, mental health, and use of digital interventions in youth during the COVID-19 pandemic: A nationally representative survey. *European Psychiatry*, 64, e20. <https://doi.org/10.1192/j.eurpsy.2021.17>.

Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing & Health*, 23, 334–340. [https://doi.org/10.1002/1098-240x\(200008\)23:4<334::aid-nur9>3.0.co;2-g](https://doi.org/10.1002/1098-240x(200008)23:4<334::aid-nur9>3.0.co;2-g).

Sun, Y., Wang, D., Han, Z., Gao, J., Zhu, S., & Zhang, H. (2020). Disease prevention knowledge, anxiety, and professional identity during COVID-19 pandemic in nursing students in Zhengzhou, China. *Journal of Korean Academy of Nursing*, 50, 533–540. <https://doi.org/10.4040/jkan.20125>.

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, 19, 349–357. <https://doi.org/10.1093/intqhc/mzm042>.

Turner, K., & McCarthy, V. L. (2017). Stress and anxiety among nursing students: A review of intervention strategies in literature between 2009 and 2015. *Nurse Education in Practice*, 22, 21–29. <https://doi.org/10.1016/j.nepr.2016.11.002>.

Usher, K., Wynaden, D., Bhullar, N., Durkin, J., & Jackson, D. (2020). The mental health impact of COVID-19 on pre-registration nursing students in Australia. *International Journal of Mental Health Nursing*, 29, 1015–

1017. <https://doi.org/10.1111/inm.12791>.

Vindegard, N., & Benros, M. E. (2020). COVID-19 pandemic and mental health consequences: Systematic review of the current evidence. *Brain, Behavior, and Immunity*, 89, 531–542. <https://doi.org/10.1016/j.bbi.2020.05.048>.

Vizheh, M., Qorbani, M., Arzaghi, S.M., Muhidin, S., Javanmard, Z., & Esmaeili, M. (2020). The mental health of healthcare workers in the COVID-19 pandemic: A systematic review. *Journal of Diabetes & Metabolic Disorders*, 19, 1–12. <https://doi.org/10.1007/s40200-020-00643-9>.

Wang, C., Horby, P. W., Hayden, F. G., & Gao, G. F. (2020). A novel coronavirus outbreak of global health concern. *The Lancet*, 395, 470–473. [https://doi.org/10.1016/S0140-6736\(20\)30185-9](https://doi.org/10.1016/S0140-6736(20)30185-9).

World Health Organization. WHO coronavirus (COVID-19) dashboard. (2021). <https://covid19.who.int/region/wpro/country/jp> Accessed 13 December 2021.

Zepke, N., Leach, L., & Butler, P. (2010). Student engagement: What is it and what influences it? <https://www.trli.org.nz> Accessed 13 December 2021.