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Research article

Nursing students' experiences of using flipcharts as a learning tool during the COVID-19 pandemic

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ABSTRACT

Background: Building mastery of clinical skills is essential for nursing students to ensure readiness for clinical placements. During the coronavirus disease (COVID-19) pandemic, limited face-to-face teaching and student access to campus facilities, along with the rapid adoption of online methods, increased the need to develop innovative teaching tools to support students.

Objective: This study aimed to explore nursing student perceptions and experiences of using Flipcharts for learning clinical nursing skills during the COVID-19 pandemic.

Design: This study used a qualitative descriptive design.

Methods: Second-year nursing students were invited to participate at the end of the semester to share their experiences of using Flipcharts in their clinical simulation laboratory. A total of 12 nursing students participated in individual semi-structured interviews conducted between December 2020 and February 2021. Data were analysed using Braun and Clarke's six-step method of thematic analysis.

Results: The findings of the study demonstrated that students considered Flipcharts to be beneficial in developing their clinical skills and were additionally valuable in supporting students with English as a second language. Three major themes were identified: the perceived value of Flipcharts during limited face-to-face teaching, the role of Flipcharts in supporting skills acquisition across learning domains, and the practicality and accessibility of this learning resource across different mediums.

Conclusion: Students perceived the use of Flipcharts to be valuable in achieving mastery of clinical skills during COVID-19. The students' experience of using Flipcharts was positive overall and found the learning tool practical and accessible in supplementing learning.

1. Introduction

The coronavirus disease (COVID-19) pandemic-associated restrictions led to several changes in the delivery of tertiary education in Australia and globally (Blevins, 2021). With limited face-to-face teaching, academics had to re-examine teaching methods and adopt remote learning. This shift in teaching methods is even more significant in undergraduate programs such as nursing, where practical skills development is as important as expanding theoretical knowledge (Suliman et al., 2021). Mastering clinical skills is essential for nursing students to ensure safe patient care during clinical placements and in their future practice. Therefore, it was necessary to re-evaluate teaching methods during the pandemic, where face-to-face instruction was limited, to ensure that nursing students continued to build their practical skills (Blevins, 2021; Bitton and Buck, 2020).

Flipcharts are teaching tools that illustrate relevant messages and have been used in various learning contexts to aid practical skills development (Christou and Thompson, 2013). An academic team of an undergraduate nursing program designed Flipcharts as supplementary learning tools during pandemic restrictions. This paper presents findings from a descriptive qualitative study that explored student perceptions and experiences of using Flipcharts as a teaching tool during the COVID-19 pandemic.

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2. Background

Traditionally, students learn psychomotor skills from a combination of didactic teaching and practical skills demonstrations in clinical skills laboratories (Staykova et al., 2017). Nursing students benefit most from supervised hands-on practice with feedback from educators (Mehdi-pour-Rabori et al., 2021). However, limitations from the COVID-19 pandemic significantly reduced the students’ time to practice new skills and learn directly from experienced educators (Blevins, 2021).

Recent papers reported the use of technology-based teaching materials such as videos to supplement face-to-face teaching (Suliman et al., 2021; Yu et al., 2021). Multimedia learning tools can be beneficial for students but have limitations (Grierson et al., 2012) as students needed to pause and play to follow through with the demonstration of skills (Tomaszewski, 2021). Thus, videos can be useful for revision but is not ideal for students practicing in real time.

The development of multimedia learning has been influenced by Mayer’s (2005) Cognitive Theory of Multimedia Learning. The three cognitive principles of processing information include: 1) dual channels for visual and auditory processing; 2) each channel has limited processing capacity; and 3) active and coordinated cognitive processing of the information received (Mayer, 2005). Cognitive processes involve selecting relevant words and images, organising coherent verbal and visual representations, and integrating representations and prior knowledge (Mayer, 2005).

Flipcharts are a simple, cost-effective strategy to aid learning (Christou and Thompson, 2013). Flipcharts have been successfully used for occupational health in nursing education in Turkey (Türk et al., 2014), diabetes-periodontitis nutrition and health education module in Malaysia (Jamil et al., 2021), and for nursing skills teaching (Mckinney et al., 2011) in the USA. In an Australian study, Yu et al. (2021) explored the use of picture-based resources for teaching clinical skills to nursing students. They reported the value of these resources in developing nursing students’ psychomotor skills, facilitating self-directed learning, and being -effective than producing videos (Yu et al., 2021). As such, developing a resource that is useful in both face-to-face, tutor-led clinical demonstrations and independent, student-led practice sessions is necessary to further support the assimilation of content and development of psychomotor skills.

The current literature indicates that flipcharts can be a helpful learning strategy in various contexts. However, its effectiveness in the context of guiding nursing students to learn new clinical skills during the COVID-19 restrictions has not been explored. This led to the research question, “What are the experiences of undergraduate nursing students in using Flipcharts to learn clinical nursing skills during the COVID-19 pandemic?”

2.1. Aim of the study

This study aimed to explore student perceptions and experiences of using Flipcharts for learning clinical nursing skills during the COVID-19 pandemic.

3. Methods

3.1. Study design

A qualitative descriptive design was used as this approach recognises the students’ different subjective perceptions and experiences (Bradshaw et al., 2017). This study adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) (Tong et al., 2007).

3.2. Setting

This study was conducted at a nursing school in Sydney, Australia. The Flipcharts were implemented as a trial resource for second-year nursing students to accommodate for the changes caused by COVID-19. Due to the enforced pandemic restrictions, all in-person classes, including lectures and tutorials, pivoted to synchronous online delivery. Face-to-face simulation laboratory sessions were permitted to continue following strict health protocols such as screening prior to entering the clinical simulation environment, reduced session times (one instead of two hours per session), smaller student numbers per class (10 instead of 20) and wearing of four-point personal protective equipment (PPE) throughout the entire session. These measures were maintained, so students continued to progress in their degree and complete the course requirements, including on-campus clinical skills assessment and off-campus clinical placement.

As a response, the Flipcharts, inspired by Mayer’s (2005) cognitive theory of multimedia learning, were developed by a group of nursing academics. The Flipcharts included clinical skills introduced to second-year students, such as the administration of intravenous (IV) medications via infusion (piggyback and burette), insertion of an indwelling urinary catheter, administration of insulin via subcutaneous route, and management of a fall incident. The images used were photographs captured in the clinical simulation laboratories, providing a more realistic and familiar learning resource. The images were organised in procedural succession with short accompanying explanations (Mayer, 2005). Critical elements of the procedures where further nursing assessments were required (e.g., assessing for signs of infection prior to connecting an IV line) were highlighted in red with added prompts.

The Flipcharts were accessible from the learning management system and were used as a primary teaching tool for tutors during skills demonstrations and for nursing students to access either in printed form or on their smart devices.

3.3. Participants and recruitment

A purposive sampling method was used to recruit the participants. The students (N = 164) were invited through email to participate in the study. The participant must meet the following inclusion criteria: completed their clinical units of study in Semesters One and Two between February and December 2020 and used Flipcharts in their simulation laboratory sessions. Recruitment ceased at the point of data saturation (Hennink et al., 2019).

3.4. Data collection

Data were collected between December 2020 and February 2021. Semi-structured interviews were conducted using an a priori interview guide. A review of the literature guided the development of the interview questions and were further refined through feedback from the pilot sessions with a small sample of students to gain feedback and ensure clarity (Sandelowski, 2000).

A trained investigator external to the teaching team (DC) conducted all interviews in English via telephone calls, as face-to-face interviews could not be conducted due to COVID-19 restrictions. Individual interviews were used to obtain more detail and insight into a participant’s personal thoughts and feelings (DeJonckheere and Vaughn, 2019). Although using focus groups can produce information that may not be gathered from an individual participant (Guest et al., 2017), it may be challenging to get an honest opinion as the participants may self-censor to avoid peers knowing their own thinking (Ching and Roberts, 2020). The discussion of the learning experience within the group context may also cause embarrassment (Sim and Waterfeld, 2019).

All interviews were 30–40 min long and were audio-recorded for transcription purposes. The interviewer used reflective probes to encourage participants to expand on their statements. This technique was employed to cover the topics of interest adequately and open the discussion for issues important to the participants. The interviewer also made detailed field notes of events and non-verbal cues during and after each interview to aid the interpretation of the data. Data were collected
until no new information arose from the data.

3.5. Data analysis

Thematic analysis by Braun and Clarke (2006) was used to analyse the data. All interviews were transcribed verbatim by the research team.

![Data Analysis Process Diagram]

Discussions and agreements of the transcripts, codes, and themes were made among all research team members at each step before moving forward.

Fig. 1. The data analysis process.
(FK, DP, JB). Listening to the audio recordings and reading and re-reading the transcripts facilitated the familiarisation with the content. Field notes during and after the interviews were also reviewed and allowed for reflection on developing ideas. Initial patterns were identified independently and were coded manually (FK, DC). Coded extracts were then grouped into potential themes, generating a thematic ‘map’ of the analysis (FC, DC). These preliminary themes and sub-themes were discussed with all members of the research team members to ensure that the properties of each theme clearly reflect their meaning. The relationships of the individual themes were further examined to ensure congruence between them as well as tell an overarching logical story. Themes were refined through an iterative process (summarised in Fig. 1) of discussion with all members of the research team. Examining the data thoroughly ensured that the analyses and relationships drawn from the interviews were both trustworthy and reasonable (Fig. 2). Pseudonyms were used upon transcription and throughout this paper to ensure participants’ anonymity and confidentiality.

### 3.6. Ethical consideration

Ethical approval was granted for this study by the Human and Research Committee of the University of Sydney.

The eligible students were invited via email, with the attached participant information sheet, only after the release of their grades to avoid any perception of coercion or influence. Options to discuss any questions regarding the study with a research team member were made available prior to agreeing to participate in the study. Written consent was obtained from each participant prior to their interview. Participants were made aware that they could withdraw from the study or cease their interview at any time without consequence.

In qualitative research, trustworthiness is used to assess rigour through credibility, dependability, transferability and confirmability (Morse, 2015). Credibility was established during data collection when the research team used open-ended questions allowing students to discuss their experiences, which they found particularly important, with minimal influence from the researcher. The interviewer was also not a member of the teaching team involved with the implementation of the Flipcharts. Dependability and confirmability were maintained during data analysis, where all research team members revised the transcripts and generated codes, themes and subthemes until a consensus was reached. Transferability was established through a thick description of the Flipcharts rollout and the students’ experiences which were described in the findings and supported by participant quotes.

### 4. Results

#### 4.1. Demographics

A total of 12 second-year nursing students participated in the study, four males and eight females. Participant demographics are reported in Table 1.

The analysis identified three main themes: 1) the perceived value of Flipcharts; 2) supporting skills acquisition across learning domains; and 3) practicality and accessibility and were summarised in a concept map (Fig. 3).

#### 4.2. The perceived value of Flipcharts

This theme described the participants’ perceptions of using Flipcharts in the clinical simulation labs during the pandemic. Despite the reduced face-to-face lab sessions, the participants found Flipcharts to be helpful in augmenting their clinical learning.

The participants agreed that Flipcharts complemented the limited face-to-face learning in the clinical simulation laboratory. The use of Flipcharts was considered by the participants as valuable in developing their understanding of the clinical skills taught in a clinical laboratory session. The Flipcharts allowed them to revise the clinical content in a guided manner and made their learning experience more satisfying.

| Pseudonym | Age | Student type | English as primary language |
|-----------|-----|--------------|-----------------------------|
| Annie     | 28  | International | No                          |
| Brendan   | 20  | International | No                          |
| Belle     | 36  | International | No                          |
| Carla     | 25  | Domestic      | Yes                         |
| Cathy     | 20  | Domestic      | Yes                         |
| Dianne    | 22  | Domestic      | Yes                         |
| Peter     | 20  | International | No                          |
| Randy     | 26  | Domestic      | Yes                         |
| Renz      | 21  | Domestic      | Yes                         |
| Sammy     | 20  | Domestic      | Yes                         |
| Shantelle | 21  | International | No                          |
| Shinru    | 20  | International | No                          |

### Table 1

Participant demographics.

| Meaning unit | Code | Subtheme | Theme |
|--------------|------|----------|-------|
| Before attending the lab session, I know nothing, flipcharts helped me to understand the whole of the lesson of the lab, I think the challenge is to myself ... to learn the new thing[s]. (Brendan) | Experience in using flipchart: learning and assessment | Innovative visual aid enhancing learning experience in clinical lab | The perceived value of flipcharts |
| One obvious impact [on our learning] was the COVID pandemic. But the flipcharts made it easier to bridge the gap between the theoretical standpoint of clinical skills and practising the skills in the lab. (Annie) | Experience in using flipchart: managing learning challenges | Specific role of flipchart during the pandemic | Supporting skills acquisition across learning domains |
| If I have a flipchart, I don’t need to use my computer, or I just bring my flipchart on the train to have a look, and also the flipchart is quite clear, so it is step by step, it is so clear, the photo is so clear. (Peter) | Experience in using flipchart: practicality | Practicality and ease of use | Practicality and accessibility |

**Fig. 2.** Examples of the thematic analysis process.
Before attending the lab session, I knew nothing. Flipcharts helped me to understand the whole of the lesson of the lab, I think the challenge is to learn the new thing(s).

(Brendan)

In an era wherein information can be readily sourced out through the internet, a participant elaborated that the Flipcharts complemented existing available resources that enhance clinical skills, which reduced the tendency to source information from non-reputable sources. Sourcing out information from the internet was considered a precursor to developing incorrect practices in performing clinical skills.

The Flipcharts acted as a separate reference to help further understand required clinical skills. Without access to Flipcharts in a unit of study, I would've either had to scroll through the different weeks on Canvas [learning management system] to find the specific steps which can be tedious, or I'd have to Google the steps and just reference one of the pre-existing but slightly differing steps for completing a clinical skill which ultimately breeds bad habits when being assessed.

(Annie)

Flipcharts were also perceived as beneficial in supporting students with English as a second language. Learning clinical skills and developing the required psychomotor skills from the perspective of an international student required an extensive process. This intricate process requires more time, and the use of Flipcharts was reported to have supported the participants in developing their skills effectively despite the language barrier.

It is more helpful... especially English is my second language, I need more time to understand the terms, especially medical terms [are] quite challenging for us ... It helps me to memorise, especially, the IV [intravenous injection] one... I have to prepare a lot of things, ... there is a lot of equipment for the IV medications, so if I have a Flipchart ... the Flipchart shows which equipment I need to do the medication before I go back to the patient, so I feel like it is quite useful ... in my opinion, it is easier to remember the things by looking at the photos.

(Peter)

Several participants highlighted that Flipcharts helped to prepare for their on-campus clinical skills assessments. In their narratives, they indicated using Flipcharts to practice assessable clinical skills and revise critical procedural elements.

They (Flipcharts) made it easy to remember steps when practising skills and could be used as a reference point throughout especially prior to the skills assessment day.

(Annie)

4.3. Supporting skills acquisition across learning domains

This theme described how Flipcharts supported the participants' acquisition of skills across the learning domains despite the pandemic. Several narratives depicted the impact of Flipcharts on their understanding of the concepts associated with clinical skills, developing confidence and psychomotor skills.

Most participants considered that Flipcharts helped them understand and learn the clinical skills and associated procedures. The structured, procedural imagery provided in Flipcharts allowed the participants to learn new clinical skills and augmented their memory of the required steps to undertake. A participant highlighted the impact of Flipcharts during a pandemic with limited face-to-face learning:

One obvious impact [on our learning] was the COVID pandemic. But the Flipcharts made it easier to bridge the gap between the theoretical standpoint of clinical skills and practising the skills in the lab.

(Annie)

This was supported by another two participants who elaborated on how Flipcharts were used to prompt them on the steps required, which helped them develop their psychomotor skills.

Before the lab, I got a copy I just bring in and go to [the] lab... and follow it and also do my revision for CPA [skills assessment] last semester. I just look into it and I kind of perform by myself, even without those tools and equipment, but I do follow every step according to the chart. I really help my memory.

(Belle)

I think sometimes I forget things, forget the steps... but the Flipchart is quite useful, especially I know what I should do for the skill, what should I do for IV medication, what should I prepare, how can I do it on a patient. (Peter)
Notably, the benefits of using Flipcharts were beyond the clinical lab session, such as peer learning. Several participants mentioned that the Flipcharts helped build their confidence to perform the procedure or peer-review each other’s performance.

I think Flipcharts … make us more confident to teach each other (in practice lab) because they have a photo, they have photos and the words, they show how each step, how to do each step.

(Annie)

Flipcharts were considered a useful tool to consolidate clinical skills prior to students’ clinical placement. In the clinical setting, nursing students are expected to demonstrate competence and efficiency in performing clinical skills. This expectation is paramount to ensure patients’ safety. Flipcharts were regarded useful by the participants in supporting their learning in real-world settings.

They [Flipcharts] were very helpful in preparing for clinical lab sessions and were a good reference point when consolidating skills, especially when going on placement.

(Annie)

I think it is quite useful… placement is a real situation, and everything goes fast and some nurses will just have body language - ‘Come on! Do it faster!’ because not all the nurses have a lot of patience to teach students … When I’m in clinical placement, I feel quite nervous, sometimes I forget things, so the Flipchart I think is useful to learn, in real-life situation.

(Annie)

The usefulness of Flipcharts extended beyond developing clinical skills to building confidence. A participant illustrated how they felt empowered sharing concepts learned in their degree by using Flipcharts.

So, my parents really want me to show them how well I did in my school, so I sometimes try to explain [to] them, explain the content I learn from school, and watch the Flipchart. I like the way it educates other people.

(Cathy)

4.4. Practicality and accessibility

This theme synthesised the accessibility and practicality of using Flipcharts. In the participants’ narratives, they indicated the ease of access of Flipcharts and its flexibility to be accessed across different devices or mediums.

The participants noted that Flipcharts were user-friendly, easy to follow, and accessible. The Flipcharts were formatted to allow usability across various mediums as preferred by the individual user. This provided the participants with various options on how to use the learning tool, such as using portable devices such as mobile phones, tablets, or personal computers.

I feel it is very handy, and I can see it on my phone, my iPad, look at it when I want to and I just see it on my phone, so I quickly review them.

(Brendan)

Similarly, a printed version of the Flipcharts was considered handy by the participants.

If I have a Flipchart, I don’t need to use my computer, or I just bring my Flipchart on the train to have a look, and also the Flipchart is quite clear, so it is step by step, it is so clear, the photo is so clear.

(Peter)

Print the Flipcharts, take [them] with me to the lab for my lab sessions, use Flipcharts as my learning guide and reference.

(Dianne)

5. Discussion

This paper presented findings on the participants’ perceptions and experiences of using Flipcharts during the COVID-19 pandemic. The findings indicated that Flipcharts supported self-directed learning and helped the students understand the steps to perform a procedure safely and effectively, particularly for those whose first language is not English. The participants found Flipcharts beneficial in acquiring newly introduced core nursing skills. Introducing new skills and abstract concepts can initially be challenging for students; therefore, having a clear, user-friendly guide not only promotes skills acquisition but also has the potential to develop skills mastery.

Studies have shown that using multimedia and technology-based teaching tools is beneficial in supporting the students’ acquisition and mastery of clinical skills (Suliman et al., 2021; Yu et al., 2021; Grierson et al., 2012). Flipchart developers must consider how the information is cognitively processed by the learners to promote their optimal use (Mayer, 2005). This study found that Flipcharts promoted visual learning and aided memory retention, allowing students opportunities to bridge the theory and practice gap. This finding is comparable to Cuevas and Dawson’s (2018) study, which found that using diagrams, images, and photographs as teaching tools helped students remember specific content effectively. Similarly, Ganier and de Vries (2016) reported that those students who use photographic guide demonstrated higher performance quality in a procedure compared to those who watched a video with text. While it is not our intention to compare video guides, this finding indicates the positive impact of using static visuals for skills acquisition.

It is worth noting, however, that a few participants in this study indicated that some of the Flipcharts had too many slides to view, detracting from their learning experience. This perception can be attributed to cognitive overload as students may feel overwhelmed by viewing large numbers of images and accompanying texts to learn a procedure. As Sweller (2020) explained in his cognitive load theory, working memory is very limited in both capacity and duration, as such influencing the effectiveness of learning materials. Processing information that simultaneously requires multiple memory types can hinder learning due to limited memory capacity (Forbes et al., 2016). As such, careful considerations must be made when developing learning tools to ensure their efficacy, quality and, more so, their understandability, actionability and accuracy (Jami et al., 2021).

In a previously published study by Yu et al. (2021), they developed and implemented a ‘clinical skills storyboard’ to present a sequential pictorial guide to provide a clear and simplified guide of complex clinical skills, which is a similar approach to the Flipcharts implemented in this study. Their study generated similar findings on promoting self-directed learning, developing confidence in undertaking clinical skills, and preparing students for clinical placement. However, as acknowledged by the authors, their findings were also taken from student evaluation of teaching, which could impact their results.

One notable finding of this study was that the participants perceived Flipcharts to be helpful in improving their confidence in performing a clinical skill. The use of a self-directed learning tool has been shown to support students in developing confidence, autonomy, motivation, and skills, as well as enhance nursing students’ critical thinking skills (Tomaszewski, 2021). Moreover, the use of information technology in clinical simulation has shown a positive impact on improving nursing students’ confidence (Braunies et al., 2021; Craig et al., 2021). The use of Flipcharts allowed the participants to develop their constructs and understanding of the clinical skills, which they then assimilated into practice, both in a clinical simulation environment and in a real-world clinical setting. Entering such a process of clinical skills acquisition resulted in the participants developing their techniques and, as such, trusting in their own capabilities to perform the clinical procedure (Vabo et al., 2022).

As the participants could trust in their capabilities, this, in turn, led
to the creation of a safe environment for peer learning. As noted in the literature, learning can occur during peer interactions and through critiquing practice situations (Boehm and Bonnel, 2010). In this study, the participants could provide informal peer reviews to their classmates and review their clinical skills in a structured and supported manner by using Flipcharts.

The flexibility of accessing and using Flipcharts has been highlighted as an educational benefit in the study findings. The participants were provided with various ways to engage with their learning tool, either as a printout or in digital format (personal computer, mobile phone, and tablet), which was easily accessible in different settings, such as in class or for revision at home. These findings highlighted the students’ various learning preferences and needs. Tharani et al. (2017) identified that a lack of digital resources could become a significant factor that can impact students’ performance and as not all students have the capacity to own personal laptops or electronic devices in order to access resources or complete academic requirements which are purely available online. Moreover, limited computer access in the clinical and placement settings and limited computer skills were identified as factors inhibiting access to online accessible resources (Moule et al., 2010). Considering these factors is essential to support student learning and promote a more inclusive learning community.

Face-to-face learning is essential for students to acquire clinical skills and develop competencies. However, nursing students must be provided with a multimodal strategy to support their learning to translate this into practice. Further mixed-methods research can be made with a larger cohort of participants to elucidate the effective design and use of multimodal learning tools for clinical skills development.

6. Limitations

There were several limitations of this study. Firstly, the study was conducted in only one setting, which limits the generalisability of the findings, although the benefits of photograph-based learning resources have been supported by current literature demonstrating the value of Flipcharts as a learning resource. Another limitation was that participants were interviewed after the semesters were completed, which may have resulted in potential recall bias.

7. Conclusion

The students perceived Flipcharts to be valuable in facilitating the learning of clinical skills and improving confidence. The participants’ experience was positive overall, and using Flipcharts was found useful beyond the clinical simulation environment and in the students’ lifelong clinical experiences. The participants valued a practical and accessible multimodal learning tool for supporting them achieve their learning outcomes. The participants benefited from strategies to achieve learning outcomes, especially at a time when opportunities to practice newly acquired skills are limited, such as during a pandemic. Accessible learning tools such as Flipcharts can be used to supplement student learning.

CRediT authorship contribution statement

JB – conceptualisation, methodology, data analysis, validation, writing - original draft, writing – review & editing.
DP – conceptualisation, methodology, validation, writing - original draft, writing – review.
DC – conceptualisation, methodology, data collection, data analysis, validation, writing - original draft, writing – review & editing.
FK – conceptualisation, methodology, data analysis, validation, writing - original draft, writing – review & editing.

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Declaration of competing interest

All authors declare no conflict of interests.

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