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Navigating nursing curriculum change during COVID-19 pandemic: A systematic review and meta-synthesis

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ABSTRACT

Aim: To consolidate the evidence around the experiences of nursing undergraduates and faculty members navigating through remote and online education during the COVID-19 pandemic.

Background: The Coronavirus disease 2019 caused by the SARS-CoV-2 Virus (COVID-19) has placed massive pressure on healthcare, economic and education systems globally. Restrictive social distancing policies and public health measures necessitated educational institutions to switch from face-to-face to remote and online education to sustain the learning process. These changes have created an uncertain path and undue stress for healthcare learners and faculty, especially for professional roles that traditionally require more hands-on and access to clinical practice particularly pre-licensure nursing students. As such, there is an urgent need to consolidate evidence on the experiences of nursing undergraduates and faculty members as they navigate the rapid transition from face-to-face to remote and online education to ensure continuity of learning in achieving optimal learning outcomes and to support them during current and future public health crises.

Design: A systematic review and meta-synthesis of the qualitative literature was undertaken using Sandelowski and Barroso's approach.

Methods: Six electronic databases, CINAHL, Embase, ERIC, PsycINFO, PubMed and Scopus, were searched systematically using the eligibility criteria from December 2019 to September 2022. The Critical Appraisal Skills Program checklist for qualitative studies was used to conduct the critical appraisal of the selected articles.

Results: Forty-seven studies were included in this review, which encapsulates the experiences of 3052 undergraduates and 241 faculty members. An overarching meta-theme 'Remote and online education: a rollercoaster ride', emerged along with three main meta-themes: (1) Transition to remote and online education: A turbulent road, (2) Acceptance of the untravelled road, (3) Hopes and recommendations for the road ahead.

Conclusion: To improve nursing undergraduates' and faculty member's navigation of remote and online education, more institutions should move towards establishing hybrid education as the new 'normal' and exercise prudence in the organisation and delivery of curriculum, teaching, well-being and clinical attachment contingencies of their healthcare courses.

1. Introduction

The Coronavirus disease 2019 caused by the SARS-CoV-2 Virus (COVID-19), was declared a pandemic by the World Health Organisation on 11th March 2020 (Anon, 2020). It placed massive pressure on

healthcare, economic and education systems globally (Byrnes et al., 2021). One area greatly affected by the pandemic is education (particularly face-to-face education) (Mian and Khan, 2020; Anon, 2020), which has been dramatically disrupted due to restrictive social distancing policies and public health measures (Byrnes et al., 2021;

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Newman and Lattouf, 2020). As school closures affected over 90% of the world's student population (Nicola et al., 2020; Taha et al., 2020), this necessitated educational institutions to switch from face-to-face to remote and online education to sustain the learning process and achieve learning goals (Byrnes et al., 2021). These changes have created an uncertain path for student roles that traditionally require more hands-on participation, particularly in nursing, where access to face-to-face learning, hands-on practice and inter-professional and intra-professional interactions are desired to prepare nursing students for their post-graduation responsibilities as qualified nurses (Dewart et al., 2020; Gruendemann, 2011). Therefore, the altered teaching and learning practices during the COVID-19 pandemic require further exploration.

2. Background

Online education, is “the method of content dissemination and rapid learning through the application of information technology” (Zhou et al., 2020, p. 502). The digitalisation of curricula is a rigorous process that can take years to refine and implement. However, the onset of the pandemic drastically compressed the timeline in online education (Williamson et al., 2020), thus placing immense pressure on both nursing undergraduates and faculty. In a study by Fitzgerald and Konrad (2021), 90% of nursing students reported difficulty in concentrating and 84% feeling anxious or overwhelmed due to this transition from a face-to-face to an online learning platform. In another study by Sacco and Kelly (2021), 75% of faculty reported their well-being was affected by this transition. Hence, there is an urgent need to consolidate evidence on the experiences of nursing undergraduates and faculty members as they navigate the rapid transition from face-to-face to remote and online education to understand their perspectives and to better support the continuity of their learning in achieving optimal learning outcomes. The knowledge gained from this review's findings may also guide educational and supportive interventions/policies to support students and faculty members better in future public health crises.

Due to the recency of the pandemic, only four reviews concerning teaching and learning during the COVID-19 pandemic were retrieved. A recent systematic review by Muhammad Hibatullah Romli et al. (2022a), (2022b) explored generic experiences of healthcare learners with technology-based teaching and learning, excluding the specific focus on the transition from face-to-face to online learning during the COVID-19 pandemic. Lastly, a systematic review by Goni-Fuste et al. (2021), a literature review by Nimavat et al. (2021) and a reflective study by Bezerra (2020) were uncovered. Goni-Fuste et al. mainly focused on the infection control practices among student nurses, Nimavat et al. focused only on challenges faced by medical undergraduates and faculty during online medical education, while Bezerra focused predominantly on the challenges of remote technologies for nurse education as the author's reflections. Importantly, to the best of the authors' knowledge, there were no qualitative systematic reviews consolidating the experiences of nursing undergraduates and faculty members as they navigate the rapid transition from face-to-face to remote and online education during the COVID-19 pandemic. A qualitative systematic review is required as “it addresses the “how” and “why” research questions and enables a deeper understanding of experiences, phenomena and context” (Cleland, 2017) (p. 69). As such, this review aims to be the first qualitative systematic review using the meta-synthesis approach to consolidate evidence on the experiences of nursing undergraduates and faculty members as they navigate the rapid transition from face-to-face to remote and online education during the COVID-19 pandemic.

3. Methods

3.1. Study design

A qualitative systematic review was conducted using Sandelowski and Barroso (2007)'s meta-synthesis approach. As this review aimed to consolidate evidence from qualitative research designs and mixed-methods designs (where qualitative data can be explicitly extracted), meta-synthesis was the most appropriate analysis approach (Booth et al., 2018). This review was also reported as per the Preferred Reporting Items for Systematic Review and Meta-Analysis Guidelines (PRISMA) guidelines (Page et al., 2021) (See Supplementary File S1).

3.2. Search strategy

Six electronic databases (PubMed, CINAHL, Embase, ERIC, PsycINFO and Scopus) were searched from December 2019 to September 2022. The start date of the search strategy was used as it aligns with the first recorded outbreak of COVID-19 (Anon, 2020). An academic librarian was consulted to guide the search process and an initial search was conducted on PubMed using the following main concepts: (“COVID-19” OR “Communicable disease” OR “Disease outbreak”) and (“Teaching” OR “Curriculum” OR “Nursing Students” OR “Nursing Faculty” OR “Nursing Education” OR “Education, distance”). The keywords and index terms were combined using Booleans and truncation symbols.

To ensure the comprehensibility of the reviewed literature, a thorough hand-search of the bibliographies of the included studies for any additional papers discussing the challenges and experiences of nursing undergraduates and faculty members facing transitioning to online education was conducted. The complete search strategy is presented in Supplementary File S2.

3.3. Eligibility criteria

The inclusion criteria for this review were qualitative peer-reviewed English-language studies: i) conducted during the Covid-19 pandemic; ii) focusing on nursing undergraduates' or faculty members as participants; iii) examining experiences of sudden curricular change to remote and/or online modality from face-to-face or due to the COVID-19 pandemic. Mixed method studies where qualitative data were presented, and data can be explicitly extracted were also included. The exclusion criteria were 1) studies focusing on postgraduate students; 2) studies on non-nursing undergraduates or faculty members as participants and 3) quantitative studies, case studies, conference proceedings, editorials and reports.

3.4. Search outcomes

A total of 53,822 studies from Embase, ERIC, PsycINFO, PubMed and Scopus were retrieved. Using EndNoteX9, 9739 duplicated studies were identified and removed. Two reviewers independently screened the titles and abstracts of the remaining 44,106 studies for relevance based on the review's topic and article type and a total of 43,984 studies were excluded. The same reviewers then independently screened the full texts of the remaining 122 studies against the eligibility criteria, resulting in 47 studies being identified and included in the qualitative review. During the screening process, inter-rater reliability of at least 95% was maintained between the reviewers and any conflicts that arose were discussed with the third author. The PRISMA flow diagram and reasons for exclusion are presented in Fig. 1.

3.5. Quality appraisal

All studies were critically appraised by two reviewers independently using the Critical Appraisal Skills Program (CASP) checklist for qualitative studies (Anon, 2018). The ten-item checklist assesses the

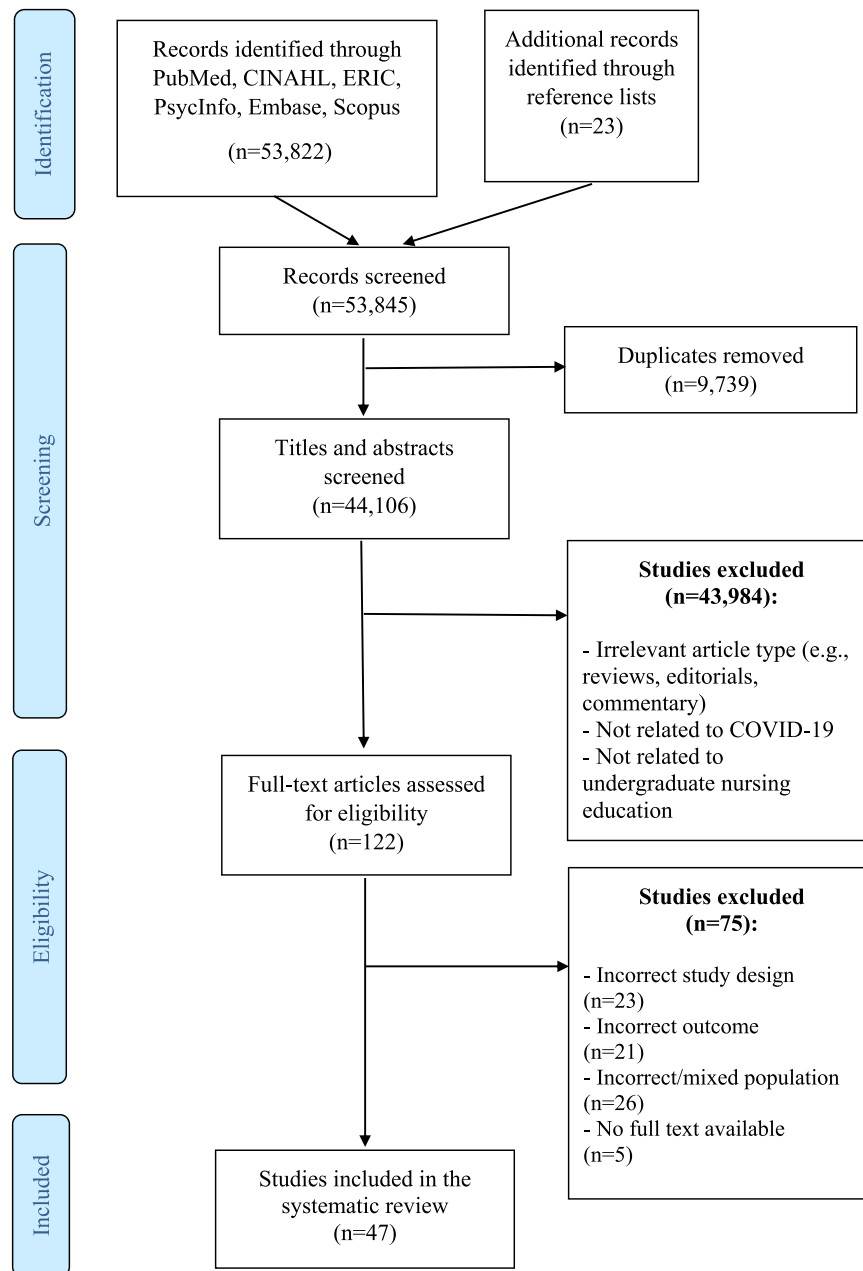


Fig. 1. PRISMA Flow Chart.

appropriateness and clarity of the study aims, study methods, reflexivity of the researchers, ethical considerations, rigour of the data analysis, findings and research value. Each item on the checklist was scored as 'Yes', 'Can't tell' or 'No'. Any conflicts that arose were discussed with the third reviewer until a consensus was reached. All studies were included regardless of their appraisal scores as the purpose of a quality appraisal is to enhance the rigour of the synthesis and not to select rigorous studies for inclusion (which could prevent all relevant information from being captured) (Walsh and Downe, 2005). The critical appraisal checklist and appraisal scores for each included study are presented in Supplementary File S3.

3.6. Data extraction

Two reviewers independently extracted the following data: study author(s), title, year, country, study design, aim(s), publication type, population characteristics, methodology and results (meta-themes and

subthemes). The direct quotations of the nursing undergraduates and faculty members (primary constructs) and analyses by the primary authors (secondary constructs) about the challenges and experiences of transitioning to online education were also extracted for thematic analysis and the generation of new meta-themes. Any conflicts that arose were discussed with the third reviewer until a consensus was reached before synthesising the data.

3.7. Data synthesis

Two reviewers independently conducted the data synthesis guided by Sandelowski and Barroso's two-step approach (Sandelowski et al., 2007). For the first step, a qualitative meta-summary method was employed for each included study consisting of: i) establishing and extracting specific research findings using primary and secondary constructs (researchers' collected or generated data, observations and interpretations in their studies); ii) separating these findings from other

data not relevant to the research questions; iii) editing findings for greater coherence for readers while maintaining the original intentions of the study’s researcher(s); iv) organising findings according to topical similarity; and v) abstracting (refining and reducing redundancies) findings into more parsimonious explanations. For the second step, findings were meta-synthesised using [Thomas and Harden \(2008\)](#)’s three-stage thematic synthesis approach. First, a line-by-line coding (using a manual colour-coding method) of the primary study findings was conducted independently by two reviewers to highlight distinct concepts and generate ‘free codes’ (i.e., codes without a hierarchical structure). Thereafter, the two reviewers independently organised the codes into descriptive themes. Finally, the descriptive themes that emerged were examined in the context of research questions. The reviewers then repeated this process as a group to generate more analytical themes by comparing them across all the included studies. These analytical themes were subsequently re-examined in the context of the research questions and changes were made when necessary. This recurring process was continued until the new analytical themes could adequately describe and/or explain all the initial descriptive themes. During this process, any conflicts that arose were discussed with the third reviewer until a consensus was reached.

4. Results

4.1. Characteristics of the included studies

Of the 47 included studies, four were published in 2020, seventeen in 2021 and twenty-six in 2022. Studies were conducted in the United States (n = 11), South Korea (n = 5), Indonesia (n = 4), Jordan (n = 4), Iran (n = 3), Australia (n = 2), Brazil (n = 2), Saudi Arabia (n = 2), Spain (n = 2) and one study each from Canada, China, Croatia, Ireland, Japan, Poland, Malaysia, Singapore, Thailand, South Africa, Turkey and the United Kingdom. Seven studies were mixed methods and forty were qualitative studies. Thirty-three studies focused on undergraduate

experiences, seven on faculty members and seven studies examined both. This review encapsulates the experiences of 3052 undergraduates and 241 faculty members. All authors collected qualitative data through either semi-structured interviews, focus group discussions, or open-ended questionnaires. Data analyses were conducted using either thematic or content analyses. Full details on the characteristics of the included studies are available in Supplementary File S4.

This meta-synthesis revealed an overarching meta-theme ‘Remote and Online Education: A Rollercoaster Road’. Nursing undergraduates and faculty members felt the remote and online education experience was filled with many sudden and extreme changes and they had to rapidly adapt to and accept the transition. This is described within the three main themes and nine subthemes in the following sections and [Fig. 2](#).

4.2. Transition to remote and online education: a turbulent road

This meta-theme highlights the challenges of maintaining academic veracity and technological difficulties with online education and the psychosocial impact of the COVID-pandemic.

4.2.1. Challenges to academic veracity

Authors from 39 studies highlighted the challenges to maintaining academic veracity and its impact. During the pandemic, continuity of learning was impeded due to difficulties with visualising, understanding and linking theoretical knowledge to practice ([Aldridge and McQuagge, 2021](#); [Atout et al., 2021](#); [Bae et al., 2020](#); [Dziurka et al., 2022](#); [Farsi et al., 2021](#); [Head et al., 2022](#); [Kunaviktikul et al., 2022](#); [Ligita et al., 2022](#); [Makhado et al., 2022](#); [Michel et al., 2021](#); [M. H. Romli et al., 2022a, 2022b](#); [Yi et al., 2022](#)). Crucial clinical skills and competencies, problem-solving, diagnostic reasoning, professional intimacy and teamwork were perceived to be insufficiently developed by both undergraduates and faculty ([Atout et al., 2021](#); [Bae et al., 2020](#); [Bdair, 2021](#); [Farsi et al., 2021](#); [Head et al., 2022](#); [Kunaviktikul et al., 2022](#);

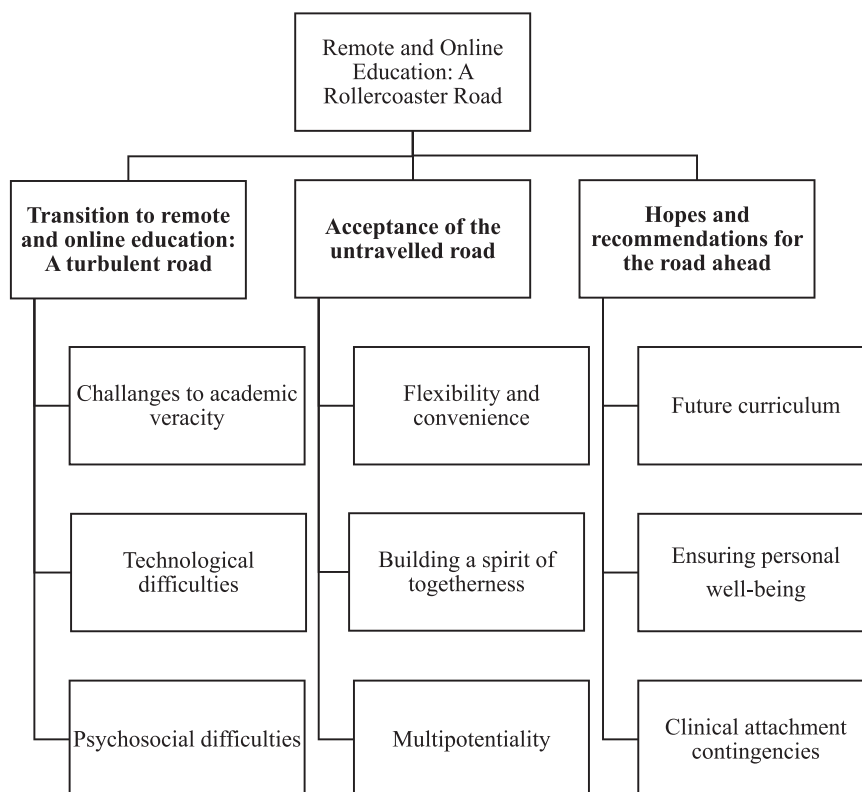


Fig. 2. Summary of themes and subthemes.

Masha'al et al., 2020; McKay et al., 2022; Moradi et al., 2022; M. H. Romli et al., 2022a, 2022b; Rood et al., 2022; Sessions et al., 2022; Smith et al., 2021; Souza, 2021; Vandenberg and Magnuson, 2021). Undergraduates expressed dissatisfaction with the discontinuation of in-person clinical attachments and practical lessons (Dziurka et al., 2022; Esposito and Sullivan, 2020; Head et al., 2022; Kunaviktikul et al., 2022; Makhado et al., 2022; Masha'al et al., 2020; Michel et al., 2021; Noh, 2021; M. H. Romli et al., 2022a, 2022b; Susmarini et al., 2022; Yi et al., 2022); lack of standardised remote teaching approach (Bdair, 2021; Masha'al et al., 2020); and poor organisation of curriculum by institutions as a result of the pandemic (Farsi et al., 2021; Iheduru-Anderson and Foley, 2021; Masha'al et al., 2020; Susmarini et al., 2022; Wallace et al., 2021).

The undergraduate-patient relationship was impaired due to limited opportunities to interact with patients (Aldridge and McQuagge, 2021; Esposito and Sullivan, 2020; Hu et al., 2022; Kunaviktikul et al., 2022; Noh, 2021; Rood et al., 2022; Salmani et al., 2022; Yi et al., 2022). Poor communication between nursing undergraduates and faculty members also caused confusion, exacerbated undergraduates' fears and insecurities and caused faculty-undergraduate relationships to deteriorate during the pandemic (Alshahrani, 2022; Bae et al., 2020; Bdair, 2021; Godbold et al., 2021; Head et al., 2022; Iheduru-Anderson and Foley, 2021; Kunaviktikul et al., 2022; Makhado et al., 2022; McKay et al., 2022; Nabolsi et al., 2021; Park and Seo, 2022; M. H. Romli et al., 2022a, 2022b; Salmani et al., 2022; Sessions et al., 2022; Smith et al., 2021; Souza, 2021; Wallace et al., 2021; Yi et al., 2022). The loss of a social environment caused by remote and online education during the pandemic increased concerns surrounding professionalism, teamwork and engagement (Alshahrani, 2022; Atout et al., 2021; Bae et al., 2020; Bdair, 2021; Godbold et al., 2021; Goodwin et al., 2022; Head et al., 2022; Iheduru-Anderson and Foley, 2021; Kunaviktikul et al., 2022; McKay et al., 2022; Nabolsi et al., 2021; Parks, 2021; M. H. Romli et al., 2022a, 2022b; Rood et al., 2022; Yi et al., 2022). As online assessment is a new phenomenon, there were validity and reliability concerns regarding its use during the pandemic (Atout et al., 2021; Bdair, 2021; Head et al., 2022; M. H. Romli et al., 2022a, 2022b; Suliman et al., 2021; Wallace et al., 2021). Academic integrity was believed to be more easily undermined due to increased difficulties in establishing true examinee identity and preventing cheating (Atout et al., 2021; Bdair, 2021; Cengiz et al., 2022; Head et al., 2022; Iheduru-Anderson and Foley, 2021; Nabolsi et al., 2021; Parks, 2021; M. H. Romli et al., 2022a, 2022b; Salmani et al., 2022; Wallace et al., 2021).

4.2.2. Technological difficulties

Authors from 29 studies reported the technological difficulties faced and their impact on education during the pandemic like poor internet connectivity (Alomari et al., 2021; Atout et al., 2021; Bae et al., 2020; Bdair, 2021; Farsi et al., 2021; Head et al., 2022; Hu et al., 2022; Iheduru-Anderson and Foley, 2021; Kunaviktikul et al., 2022; Ligita et al., 2022; Makhado et al., 2022; Mamnuah and Wantonoro, 2022; Manik et al., 2022; Michel et al., 2021; Moradi et al., 2022; Parks, 2021; M. H. Romli et al., 2022a, 2022b; Rood et al., 2022; Ropero-Padilla et al., 2021; Salmani et al., 2022; Vandenberg and Magnuson, 2021; Yi et al., 2022), especially in rural or remote areas (Bdair, 2021; Kunaviktikul et al., 2022; Ligita et al., 2022; Michel et al., 2021; Vandenberg and Magnuson, 2021) which led to delays or failures when uploading or downloading course material (Bae et al., 2020; Kunaviktikul et al., 2022; Masha'al et al., 2020; Moradi et al., 2022; Nabolsi et al., 2021) and frequent disconnections and glitches while navigating online platforms (Atout et al., 2021; Bae et al., 2020; Head et al., 2022; Kunaviktikul et al., 2022; Parks, 2021; Wallace et al., 2021; Yi et al., 2022). This caused a rise in technophobia (fear of disconnection), especially during assessments, affecting overall academic performance (Atout et al., 2021; Bdair, 2021; Head et al., 2022; Suliman et al., 2021) and causing mistrust between undergraduates and faculty (Wallace et al., 2021).

Concerns of digital fatigue were also highlighted among both

undergraduates and faculty during the pandemic (Bae et al., 2020; Esposito and Sullivan, 2020; Head et al., 2022; Hu et al., 2022; Iheduru-Anderson and Foley, 2021; Park and Seo, 2022; M. H. Romli et al., 2022a, 2022b; Souza, 2021). The faculty's unfamiliarity with remote teaching pedagogies and poor digital literacy severely deteriorated undergraduates' learning experience (Alomari et al., 2021; Iheduru-Anderson and Foley, 2021; McKay et al., 2022; Michel et al., 2021; Moradi et al., 2022; Nabolsi et al., 2021; Parks, 2021; Smith et al., 2021; Wallace et al., 2021). This was exacerbated by the lack of information technology (IT) support (Alomari et al., 2021; Farsi et al., 2021; McKay et al., 2022; Moradi et al., 2022; Smith et al., 2021). The cost of technological devices and the internet was a significant financial burden (especially in families where income was affected by the pandemic) (Bdair, 2021; Farsi et al., 2021; Masha'al et al., 2020; Moradi et al., 2022; M. H. Romli et al., 2022a, 2022b; Suliman et al., 2021). Some undergraduates even reported having to share a single device among multiple family members, affecting their overall experience of remote and online education during the pandemic (Bdair, 2021; Nabolsi et al., 2021; Suliman et al., 2021).

4.2.3. Psychosocial difficulties

Authors from 40 studies identified the psychosocial difficulties faced by the students and the faculty. As undergraduates and faculty members were preoccupied with the uncertainties caused by the pandemic and feared that they and their families would be affected, their adjustment to online education was affected (Alshahrani, 2022; Atout et al., 2021; Bae et al., 2020; Cengiz et al., 2022; Farsi et al., 2021; Godbold et al., 2021; Head et al., 2022; Kunaviktikul et al., 2022; Lovrić et al., 2020; Makhado et al., 2022; Martin-Delgado et al., 2022; Michel et al., 2021; Nabolsi et al., 2021; Parks, 2021; M. H. Romli et al., 2022a, 2022b; Rood et al., 2022; Sessions et al., 2022; Smith et al., 2021; Suliman et al., 2021; Susmarini et al., 2022; Yi et al., 2022). Faculty felt overwhelmed by the short timeframe to pivot to remote teaching coupled with an increased workload, steep learning curves of new technologies and delayed career advancements (Bdair, 2021; Farsi et al., 2021; Iheduru-Anderson and Foley, 2021; McKay et al., 2022; Moradi et al., 2022; Nabolsi et al., 2021; Parks, 2021; Sessions et al., 2022; Smith et al., 2021; Vandenberg and Magnuson, 2021). Conversely, undergraduates felt overwhelmed by an increased number of assessments, diminished academic achievements, poorer clinical readiness and uncertainty over future career prospects caused by the pandemic (Aldridge and McQuagge, 2021; Alomari et al., 2021; Bdair, 2021; Cengiz et al., 2022; Dziurka et al., 2022; Head et al., 2022; Hu et al., 2022; Iheduru-Anderson and Foley, 2021; Kunaviktikul et al., 2022; Makhado et al., 2022; Masha'al et al., 2020; Michel et al., 2021; Noh, 2021; Park and Seo, 2022; M. H. Romli et al., 2022a, 2022b; Rood et al., 2022; Suliman et al., 2021; Susmarini et al., 2022; Yi et al., 2022).

Nursing undergraduates and faculty also described remote education as an 'incredibly isolating experience', lacking adequate physical interactions or connections and support mechanisms (Abdelkader and Barbagallo, 2022; Aldridge and McQuagge, 2021; Alomari et al., 2021; Atout et al., 2021; Bae et al., 2020; Cengiz et al., 2022; Farsi et al., 2021; Goodwin et al., 2022; Head et al., 2022; Iheduru-Anderson and Foley, 2021; Jung and Kang, 2022; Kunaviktikul et al., 2022; Michel et al., 2021; Nabolsi et al., 2021; Park and Seo, 2022; M. H. Romli et al., 2022a, 2022b; Rood et al., 2022; Wallace et al., 2021; Yi et al., 2022). Faculty members who were caregivers were not only overwhelmed by caregiving duties but also feared missing professional advancement opportunities due to conflicting personal and workplace responsibilities (Castillo-Parra et al., 2022; Iheduru-Anderson and Foley, 2021; Nabolsi et al., 2021; Parks, 2021; Smith et al., 2021; Souza, 2021). Many undergraduates and faculty working on the frontlines during the pandemic also reported being morally traumatised by burnout from increased responsibilities (Head et al., 2022; Suliman et al., 2021; Susmarini et al., 2022), having less learning or working flexibility (Head et al., 2022; Ligita et al., 2022; Suliman et al., 2021; Susmarini et al., 2022); and

experiencing public stigmatisation of healthcare professionals (Lovrić et al., 2020). Nursing undergraduates also feared getting exposed to COVID-19 in clinical settings and potentially infecting patients and vulnerable family members (Alomari et al., 2021; Bae et al., 2020; Cengiz et al., 2022; Dziurka et al., 2022; Farsi et al., 2021; Kunaviktikul et al., 2022; Lovrić et al., 2020; Martin-Delgado et al., 2022; M. H. Romli et al., 2022a, 2022b; Sessions et al., 2022; Susmarini et al., 2022).

4.3. Acceptance of the untravelled road

This meta-theme highlights the positive impact of online education on nursing undergraduates and faculty members during the COVID-19 pandemic.

4.3.1. Flexibility and convenience

Authors from 20 studies discussed the positive impact of flexibility and convenience. Both undergraduates and faculty experienced savings in cost, energy and time (Abdelkader and Barbagallo, 2022; Alomari et al., 2021; Bae et al., 2020; Bdair, 2021; Head et al., 2022; Hu et al., 2022; Kunaviktikul et al., 2022; Ligita et al., 2022; Lovrić et al., 2020; Michel et al., 2021; M. H. Romli et al., 2022a, 2022b; Salmani et al., 2022; Sessions et al., 2022; Smith et al., 2021; Suliman et al., 2021; Wallace et al., 2021; Yoo and Jung, 2022). Remote education during the pandemic increased engagement for discussion as it allowed undergraduates to post questions online and hold smaller sub-group discussions with breakout-room features conducted by educators (Alshahrani, 2022; Head et al., 2022; Hu et al., 2022; M. H. Romli et al., 2022a, 2022b; Yoo and Jung, 2022). Importantly, the flexibility to consume online education at their own pace and the unlimited replay ability of recorded material deepened learning and improved academic achievement during the pandemic (Bae et al., 2020; Bdair, 2021; Head et al., 2022; Hu et al., 2022; Kunaviktikul et al., 2022; Park and Seo, 2022; M. H. Romli et al., 2022a, 2022b; Salmani et al., 2022; Wallace et al., 2021; Yoo and Jung, 2022).

4.3.2. Building a spirit of togetherness

Authors from 19 studies revealed the impact of fostering a spirit of togetherness. The unsolicited appreciation, positive feedback and concern shown by undergraduates for their faculty's efforts motivated the faculty to persevere with remote teaching during the pandemic (Aldridge and McQuagge, 2021; Dziurka et al., 2022; Esposito and Sullivan, 2020; Farsi et al., 2021; Head et al., 2022; Iheduru-Anderson and Foley, 2021; Kunaviktikul et al., 2022; Ligita et al., 2022; Lovrić et al., 2020; Martin-Delgado et al., 2022; Michel et al., 2021; M. H. Romli et al., 2022a, 2022b; Yi et al., 2022). Faculty members also valued opportunities to develop a spirit of togetherness with their colleagues (Iheduru-Anderson and Foley, 2021; McKay et al., 2022; Sessions et al., 2022). With remote education, the ease and frequency of undergraduate-faculty communication improved (Aldridge and McQuagge, 2021; Dziurka et al., 2022; Kunaviktikul et al., 2022; McKay et al., 2022), contributing to a spirit of togetherness in the online environment (Aldridge and McQuagge, 2021; Esposito and Sullivan, 2020; Kunaviktikul et al., 2022). During a pandemic, this spirit of togetherness can be further fostered if faculty members provide clear instructions for remote and online education and timely feedback (Farsi et al., 2021; Kunaviktikul et al., 2022; Nabolssi et al., 2021; M. H. Romli et al., 2022a, 2022b; Smith et al., 2021; Yi et al., 2022; Yoo and Jung, 2022); good faculty leadership and transparency (Iheduru-Anderson and Foley, 2021); effective safety measures for prevention of infection (Farsi et al., 2021; Ligita et al., 2022; Lovrić et al., 2020; Susmarini et al., 2022) and adequate support for undergraduates' needs and well-being (Dziurka et al., 2022; Farsi et al., 2021; Head et al., 2022; Iheduru-Anderson and Foley, 2021; Kunaviktikul et al., 2022; Ligita et al., 2022; McKay et al., 2022; Sessions et al., 2022).

4.3.3. Multipotentiality

Authors from 23 studies showed the multipotentiality of remote and online education and its impact during the pandemic. Remote education maintained teaching and learning continuity while allowing undergraduates to still develop competencies, achieve workplace learning and explore career interests (Bdair, 2021; Iheduru-Anderson and Foley, 2021; Kunaviktikul et al., 2022; Susmarini et al., 2022). During the pandemic, remote education provided benefits including added or unique learning opportunities (Alomari et al., 2021; Esposito and Sullivan, 2020; Godbold et al., 2021; Head et al., 2022; Iheduru-Anderson and Foley, 2021; Kunaviktikul et al., 2022; Lovrić et al., 2020; Suliman et al., 2021); improved self-learning, creativity and resourcefulness (Cengiz et al., 2022; Head et al., 2022; Iheduru-Anderson and Foley, 2021; Kazawa et al., 2022; Kunaviktikul et al., 2022; McKay et al., 2022; Suliman et al., 2021; Susmarini et al., 2022; Wallace et al., 2021; Yoo and Jung, 2022); and greater inclusivity for individuals with learning difficulties or social phobias (Bdair, 2021; McKay et al., 2022). Virtual simulations, a facet of remote learning, allowed for diverse immersive experiences, sharpening communication skills, deeper learning and increased exposure and preparation for unique clinical case scenarios during the pandemic (Aldridge and McQuagge, 2021; Esposito and Sullivan, 2020; Head et al., 2022; Joung and Kang, 2022; Kazawa et al., 2022; Manik et al., 2022; Wallace et al., 2021). Additionally, the interactive remote education software tools were viewed by undergraduates and faculty as an effective way to combat disengagement and digital fatigue (Goodwin et al., 2022; Hu et al., 2022; Park and Seo, 2022; Ropero-Padilla et al., 2021; Smith et al., 2021; Wallace et al., 2021). Remote education also spurred the professional and personal development of faculty members by improving their competency with remote teaching software, the technological knowledge gained allows them to easily navigate faculty work and student response in the teaching software and learn something new they were unaware of (Iheduru-Anderson and Foley, 2021; Kunaviktikul et al., 2022).

4.4. Hopes and recommendations for the road ahead

This meta-theme outlines nursing undergraduates' and faculty members' future hopes for integrating online education into the nursing curriculum, well-being and clinical attachments.

4.4.1. Future curriculum

Authors from 25 studies outlined the hopes and recommendations for future curricula. Faculty-undergraduate communication could be improved to maintain the educational environment during a pandemic (Bdair, 2021; Head et al., 2022; Mamnuah and Wantonor, 2022). To ensure uniform high-quality nursing education, educational bodies should clearly define their roles, involve all stakeholders when advising for institutional navigation and standardise assessment format and policies (Bdair, 2021; Farsi et al., 2021; Head et al., 2022; Iheduru-Anderson and Foley, 2021; Nabolssi et al., 2021; Rood et al., 2022; Smith et al., 2021). Suggestions to deliver undergraduate-centred teaching during the pandemic include: providing recorded lectures and review materials as desired (Bdair, 2021; Farsi et al., 2021; M. H. Romli et al., 2022a, 2022b; Smith et al., 2021; Wallace et al., 2021; Yoo and Jung, 2022); reducing or simplifying academic content and time required (Bdair, 2021; Makhado et al., 2022; M. H. Romli et al., 2022a, 2022b); standardising the teaching strategy and software used (Bdair, 2021; Farsi et al., 2021; Head et al., 2022); and providing technology subsidies to needy undergraduates (Suliman et al., 2021). Importantly, the need for IT support for software training, troubleshooting, data management and security was advocated during the pandemic (Alomari et al., 2021; Bdair, 2021; Makhado et al., 2022; Masha'al et al., 2020; M. H. Romli et al., 2022a, 2022b).

Methods to improve engagement and togetherness with remote and online education involve a good balance of asynchronous or synchronous sessions (Esposito and Sullivan, 2020; Goodwin et al., 2022; Parks,

2021; M. H. Romli et al., 2022a, 2022b); active group discussions (Hu et al., 2022; Smith et al., 2021) with timely feedback (Esposito and Sullivan, 2020; Head et al., 2022; M. H. Romli et al., 2022a, 2022b; Smith et al., 2021; Yoo and Jung, 2022); small-group or small-class settings (Aldridge and McQuagge, 2021; Bdair, 2021; Hu et al., 2022; Wallace et al., 2021); and utilising interactive features or tools for teaching (Abdelkader and Barbagallo, 2022; Bdair, 2021; M. H. Romli et al., 2022a, 2022b; Ropero-Padilla et al., 2021; Smith et al., 2021). Many nursing undergraduates and faculty believed that while some theory-based courses can be moved online (Bdair, 2021; Mamnuah and Wantonoro, 2022; Suliman et al., 2021), clinical or laboratory or practical-based courses should remain in-person even during the pandemic and special arrangements should be made to accommodate this (Abdelkader and Barbagallo, 2022; Farsi et al., 2021; Head et al., 2022; Joung and Kang, 2022; Kunaviktikul et al., 2022; Ligita et al., 2022; Makhado et al., 2022; Rood et al., 2022).

4.4.2. Ensuring well-being

Authors from 20 studies outlined the hopes and recommendations for personal well-being towards online learning. Necessary improvements to personal well-being in online learning included the need to advocate for breaks in between long online teaching sessions (Hu et al., 2022; M. H. Romli et al., 2022a, 2022b); establish work-life balance at home (Head et al., 2022; Iheduru-Anderson and Foley, 2021; Parks, 2021; Sessions et al., 2022); guidance for motivating students while learning online (Hu et al., 2022; Ligita et al., 2022; M. H. Romli et al., 2022a, 2022b; Smith et al., 2021); opportunities for personal or professional development (Castillo-Parra et al., 2022; Cengiz et al., 2022; Smith et al., 2021; Susmarini et al., 2022); and sufficient psychosocial and family support for nursing undergraduates and faculty (Abdelkader and Barbagallo, 2022; Castillo-Parra et al., 2022; Iheduru-Anderson and Foley, 2021; Ligita et al., 2022; Mamnuah and Wantonoro, 2022; McKay et al., 2022; Nabolsi et al., 2021; M. H. Romli et al., 2022a, 2022b; Sessions et al., 2022; Suliman et al., 2021; Susmarini et al., 2022).

Methods to support personal well-being during the pandemic included faculty members developing well-shaped communication, guidance and expectations during online learning (Mamnuah and Wantonoro, 2022); establishing communication timeframe boundaries between faculty members and students for better work-life balance (Nabolsi et al., 2021); arranging self-directed study groups for students to interact and motivate each other (Bdair, 2021; Hu et al., 2022; Noh, 2021; M. H. Romli et al., 2022a, 2022b; Wallace et al., 2021); advocating time for self-care (Castillo-Parra et al., 2022; Cengiz et al., 2022; Godbold et al., 2021; Head et al., 2022; Iheduru-Anderson and Foley, 2021; M. H. Romli et al., 2022a, 2022b; Susmarini et al., 2022; Wallace et al., 2021); and support from families in the form of attention and understanding during online learning (Ligita et al., 2022; Mamnuah and Wantonoro, 2022).

4.4.3. Clinical attachment contingencies

Authors from 14 studies highlighted the hopes and recommendations regarding clinical attachments during the pandemic. If clinical attachments cannot resume, faculty should consider: compensatory or make-up in-person practical sessions post-pandemic (Bdair, 2021; Sessions et al., 2022; Suliman et al., 2021); blended learning through online simulated practical sessions (Kazawa et al., 2022; Nabolsi et al., 2021; Ropero-Padilla et al., 2021); and widening the variety of interactive cases (Abdelkader and Barbagallo, 2022; Goodwin et al., 2022; Kazawa et al., 2022; M. H. Romli et al., 2022a, 2022b; Smith et al., 2021; Wallace et al., 2021; Yi et al., 2022). Importantly, some nursing undergraduates (particularly final-years) still felt they should be given the option to complete their clinical attachments despite the pandemic, as they wanted to be prepared and make an immediate contribution on entering the workforce (Lovrić et al., 2020; Martin-Delgado et al., 2022).

5. Discussion

This review consolidated the experiences of nursing undergraduates and faculty members navigating and transitioning from face-to-face to online teaching and learning during the COVID-19 pandemic. This is important to be explored as stakeholders, educators and practitioners require up-to-date evidence to inform future teaching and learning practices among healthcare learners especially nurses as they make the largest healthcare workforce and play an integral part in ensuring safe and stable healthcare (Mlambo et al., 2021). Our review showed remote and online education generated mixed opinions among both nursing undergraduates and faculty, ultimately resulting in disparities in the experiences of the transition to remote and online education.

5.1. Transition to remote and online education: a turbulent road

Our findings found many undergraduates and faculty members felt remote and online education could not replicate the social interactions and active learning present in on-campus or in-hospital settings, which were corroborated by the four prior reviews (Bezerra, 2020; Goni-Fuste et al., 2021; Nimavat et al., 2021; Muhammad Hibatullah Romli et al., 2022). This sentiment could be attributed to the fact that limited social interactions during remote learning decreased undergraduate engagement and increased attrition (Gray and Diloreto, 2016; Martin and Bolliger, 2018). Therefore, while innovation is essential, attention is needed to be paid to 'humanise' remote education technology as undergraduate-faculty interactions can easily become fleeting, lost, or superficial when utilising these technologies during the pandemic (Pacansky-Brock and Vincent-Layton, 2020). Previous literature by Nimavat et al. (2021) supports our findings that a significant challenge for faculty members was the steep learning curve of remote modalities and the need to transform already prepared face-to-face education materials quickly and appropriately to be delivered remotely. This is substantiated by Rapanta et al. (2020), who found that during the COVID-19 pandemic, faculty faced an exponential increase in workload as the preparation of online material is three times longer than that of traditional material. Even before the pandemic, nursing faculty often struggled to efficiently manage time given the comprehensiveness of the healthcare curriculum. This is coupled with the short preparation time afforded, especially exacerbated the difficulty for faculty members teaching practical-based or clinical-based modules which are the most popular yet most difficult to replicate online (Dhawan, 2020). Furthermore, as all these are at the expense of faculty members' mental health and personal life, institution leaders must consider the relationship between remote education and faculty's well-being and ensure there are adequate work training and counselling on emotion regulation, problem-solving and resilience to better prepare for future public health crises (Jakubowski and Sitko-Dominik, 2021).

Our review also uncovered the lack of proficiency using the remote software platforms, digital literacy and technical difficulties were significant challenges at the onset of transition to remote learning, which was confirmed by previous studies (Bezerra, 2020; Naciri et al., 2021; Nimavat et al., 2021; Muhammad Hibatullah Romli et al., 2022). This is further validated by Ferri et al. (2020) who found insufficient preparedness and training were the most significant obstacle reported to adopting remote learning during the early stages of the COVID-19 pandemic. The use of technologies for teaching requires faculty to integrate a broader pedagogical process, therefore institution leaders (particularly those who have not fully embraced a blended learning approach) need to ensure faculty can visualise the benefit of these tools to increase successful uptake through faculty development activities (Steinert et al., 2006). Previous literatures by Nimavat et al. (2021) and Goni-Fuste et al. (2021) supported our findings that undergraduates and faculty felt overwhelmed by the severity and uncertainty of the pandemic and the impact on their family's wellbeing. Pandemics and epidemics have been shown to more significantly impact the physical

and mental well-being of healthcare workers and students (and by extension their families) compared with the general population, as they are often recalled to clinical areas to meet staffing demands (Shaukat et al., 2020). With the implementation of unprecedented quarantine and social distancing strategies to curb the spread of the virus, both undergraduates and faculty experienced loneliness and social isolation (Nicola et al., 2020; Taha et al., 2020). Therefore, institutions must ensure adequate and appropriate psychological support during public health crises for both undergraduates and faculty to prevent absenteeism and mental health-related repercussions.

5.2. Acceptance of the untravelled road

Our findings showed the main impetus toward the acceptance of remote and online education was its flexibility and convenience and this was supported by Nimavat et al. (2021) and Naciri et al. (2021). This is further established by Dhawan (2020), who reported students felt the remote learning-teaching process was more student-centred, innovative and flexible compared with traditional methods. Given digital literacy skills among undergraduates are generally high, these findings were congruent with a study showing most younger tech-savvy generation found remote learning applications user-friendly and easily accessible (Mahlangu, 2018). Therefore, these findings highlight the online education approach is a step in the right direction as it was met with overwhelming receptivity and education leaders (particularly those who have not fully embraced a blended learning approach) should be acutely aware to swing this momentum in their favour. Previous literature by Nimavat et al. (2021) supported our findings, elaborating that with convenient access to recorded material along with a comfortable learning environment, undergraduates experienced more significant academic achievement during the pandemic. This is further substantiated by Geng et al. (2019), who showed that based on the Theory of Planned Behaviour (TPB), remote learning enables students to learn at any time, encouraging self-directed learning. TPB proposes that an individual's behaviour is determined by his intentions, beliefs and subjective norms (Ajzen, 1991). To retain the gains made during the pandemic, institutions must keep undergraduates motivated to use online education. This can be achieved by ensuring their remote learning infrastructure is periodically updated with an extensive array of modern teaching materials presented in different interactive mediums that cater to the changing individual needs of undergraduates (Coman et al., 2020; Van Wart et al., 2020). The attitudes and subjective norms of undergraduates of online education depend on its success in the long term that is if online education successfully sustains their continuity of learning and academic progress, they will be more inclined to use online education (Geng et al., 2019).

5.3. Hopes and recommendations for the road ahead

Unlike previous literature, our findings newly discovered that nursing undergraduates and faculty largely preferred hybrid education as opposed to a purely online curriculum during the pandemic, as the healthcare profession depends more on practical skills that require experiential learning to master. Additionally, our findings highlighted augmented virtual simulation to sustain clinical learning during the COVID-19 pandemic was largely reported by both nursing undergraduate and faculty members to be effective. This is supported by Plotzky et al. (2021) who found that while virtual simulation has long been heralded as an opportunity for students to experience real-life situations virtually in prior curricula, the explosion of virtual simulation due to COVID-19 has been unprecedented. The notability of virtual simulation in nursing education will likely persist post-pandemic and be incorporated into standard practice, therefore institution leaders could consider investing, designing and integrating augmented virtual simulation into their nursing curriculum as a back-up for future public health crises where in-hospital activities would inevitably be limited. However, while

there are existing studies investigating its use in nursing education (Chen et al., 2020; Jallad and Işık, 2022; Weiss et al., 2018), augmented virtual simulation is still a fairly underdeveloped area in nursing education and further studies are required to develop best practices to prepare nursing students for online learning.

5.4. Limitations

Relevant studies may have been left out due to unclear titles or abstracts, poor indexing and the exclusion of non-English-language studies. There could be potential bias in the experiences of interviewed nursing undergraduates and faculty as they could have been more motivated to share their experiences than those who were unwilling to participate. In addition, as the included studies were conducted during the pandemic when nursing students and faculty could have been more positive or grateful just to continue their education, the longitudinal evaluation and analysis of online teaching and learning are warranted. As only the experiences of nursing undergraduates and faculty have been extracted, future studies could also consider exploring the experiences of other stakeholders in the educational system.

5.5. Future Implications

The findings of this review may guide future educational practices and may lend insights for contingency planning during future public health crises. As more institutions globally begin transitioning to hybrid education as the new 'norm', insights from this review could inform institutions who have not embraced a blended learning approach on strategies to ensure continuity of learning and achieve learning objectives and institutions that have already established blended learning on strategies to retain the gains made during the pandemic.

6. Conclusion

This qualitative systematic review consolidated and meta-synthesised the available qualitative evidence on the experiences of nursing undergraduates and faculty members as they navigated curriculum changes during COVID-19. Three main themes were identified: 1) 'Transition to remote and online education', this theme highlighted the participants' experiences about transitioning to remote and online education as turbulent due to academic veracity challenges and technological and psychosocial difficulties; (2) Acceptance of the un-travelled road, where participants highlighted the acceptance of remote and online education through flexibility and convenience, multipotentiality and fostering a spirit of togetherness; (3) Hopes and recommendations for the road ahead for the future of remote education. Our review proposes having policies in place to support students and faculty including 'humanising' remote learning technology to improve undergraduate-faculty relationships, providing adequate psychosocial support for nursing undergraduates and faculty members and encouraging online faculty development activities to enhance receptiveness to blended learning pedagogies. Improving the stability and comprehensibility of remote learning platforms; and investing in, developing and integrating augmented virtual simulation into the nursing curriculum are other suggested ways to support undergraduates and faculty members in future public health crises.

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Conflict of interest

None. The authors declare that there are no competing interests.

Declaration of Competing Interest

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.nepr.2022.103483](https://doi.org/10.1016/j.nepr.2022.103483).

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