

Review

Online degree programmes in nurse education—Students' perceptions and academic performance: An integrative review

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ABSTRACT

Objectives: The aim of this integrative review is to identify, describe, and synthesise evidence regarding students' perceptions of online degree programmes in nurse education, their academic performance, and the factors associated with their academic performance.

Design: Integrative review.

Data sources: Four databases, CINAHL, ERIC (Ebsco), PubMed/MEDLINE, and Web of Science were searched. The reference lists of included studies were reviewed to identify other relevant studies.

Review methods: Whittemore and Knaf's method was used as a guideline for the integrative review. Peer-reviewed studies describing students' perceptions of—or academic performance in—online degree programmes in nurse education were included in the review without time limitations. The quality of the selected article was assessed using the Mixed Method Appraisal Tool.

Results: Nursing students' perceptions of online degree programmes were categorised into enabling career development, content delivered online, and community belonging. Factors related to student's academic performance were associated with individual students and the characteristics of online learning environments. Factors associated with students' academic performance were individual self-direction, formal communication skills, and working and educational backgrounds. Factors associated with academic performance in an online learning environment were categorised into regular feedback and methods for learning.

Conclusions: Online degree programmes in nurse education contribute to developing pedagogy through a satisfactory work-life balance, students' experiences of community and support, pleasant digital content, and various teaching methods by faculties. The study findings of this review have implications for educators to develop and adopt strategies for advancing digital environments with the pedagogy that supports community building to meet the needs of individual students.

1. Background

Policy-makers and leaders in nurse education have considered various mechanisms to respond to the shortage of healthcare professionals (World Health Organization, 2020). They are challenged to find ways to design programmes that fulfil the nursing workforce's needs (Hensley et al., 2021). Online programmes may offer effective educational options for students with fewer options for education, such as those in rural and remote areas (World Health Organization, 2020). In this review, we define an online degree programme as a form of education in which the theoretical content is delivered in an online

environment. We utilised Singh and Thurman's (2019) definition of online learning, where students are not dependent on their physical or virtual co-location, the teaching content is delivered online, and study modules can be asynchronous or synchronous and managed via the internet (Singh and Thurman, 2019).

The prevalent trend is expanding degree education from traditional to online (Organisation for Economic Cooperation and Development, 2021). There is also a global focus on improving the integration of digital technologies into education (European Commission et al., 2017). The use of digital learning in nurse education provides multiple alternatives for innovative teaching and learning (Sormunen et al., 2021) and

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collaborative relationships in university nursing programmes (Fitzgerald and Townsend, 2012; Sumpter et al., 2022), health services, and rural areas (Fitzgerald and Townsend, 2012). Online modes offer students multiple benefits, including flexible schedules, the possibility of earning a higher education degree while working or caring for family members at home (Bickle et al., 2019), and control over their learning (Sormunen et al., 2020).

The benefits of online education must be considered alongside known barriers, including student disengagement, work-life balance difficulties for full-time students, and technological challenges for both students and instructors (Roddy et al., 2017). Competent online instructors are needed (Gregory and Lodge, 2015).

Competence requirements in nurse education must be fulfilled, irrespective of how nurse education is conducted (European Parliament and of the Council, 2013/55/E.U.; Nursing and Midwifery Board of Australia, 2016; Nursing and Midwifery Council, 2018) as an individual's competence is a critical attribute for the provision of safe, ethical, and high-quality care (Flinkman et al., 2017). Academic performance, that is, the level of professional skills or behaviours attained by a student (Alshammari et al., 2017), is a crucial attribute of an individual's competence in nursing practice (Flinkman et al., 2017). While the demand for online degree programmes in nurse education is rapidly expanding, further research on the factors associated with students' academic performance is needed. Educators must understand and evaluate the factors influencing students' performance, graduate success (Terry and Peck, 2020), and learning experiences (Bickle et al., 2019; Nortvig et al., 2018). Evidence-based synthesised knowledge of students' perceptions and factors associated with their academic performance is needed to present a more comprehensive understanding (Whittemore and Knaf, 2005) to develop nurse education further. We defined academic performance as an action, process, task, or function performed in relation to education (MOT Oxford Dictionary of English, 2023a, 2023b), reflecting students' ability to demonstrate the performance of professional skills or behaviours (Alshammari et al., 2017), or short- or long-term educational goals (Tadese et al., 2022).

2. Aim of the literature review

The aim of this integrative review is to identify, describe, and synthesise evidence regarding students' perceptions of online degree programmes, their academic performance, and the associated factors in an online degree programme in nurse education (Whittemore and Knaf, 2005). The research questions are as follows:

1. What are nursing students' perceptions of online degree programmes in nurse education?
2. How do nursing students perform academically in online degree programmes in nurse education?
3. What factors are associated with nursing students' academic performance in online nurse education programmes?

3. Methods

3.1. Integrative review

An integrative review design (Whittemore and Knaf, 2005) was selected to support a comprehensive view of the topic by including studies with various designs. Reporting was guided by the Preferred Items for Systematic Reviews and Meta-Analyses (PRISMA) (Page et al., 2021).

3.2. Search strategy

A literature search was conducted in May 2023 using CINAHL (EBSCO), ERIC (EBSCO), PubMed/MEDLINE, and Web of Science databases to identify studies in the English language. The following search

terms were used with a database-specific truncation: 'online degree', online* and 'degree program*', 'distance degree', 'distanc* and 'degree program*', 'remote degree', remot* and 'degree program*', health*, nurs*. The search was limited to peer-reviewed scientific articles without time limitations. The reference lists of included studies were reviewed to identify other relevant studies.

3.3. Inclusion criteria and study selection

Studies were included if: 1) participants were students at the bachelor level in an online degree programme in nurse education; 2) the study described students' perceptions, academic performance, or the factors associated with academic performance; and 3) the study examined an online degree programme in nurse education. Studies were excluded if: 1) the participants were master-degree-level students or other professionals; 2) the study focused on a module, or an individual component; 3) the study was implemented in other healthcare fields; or 4) the publication was a discussion paper, book, conference paper, report, or column. The study selection process was conducted by two researchers (T.H., H.V.), followed by a consensus discussion with the research team regarding the studies' inclusion and exclusion.

3.4. Quality appraisal

The methodological quality of the selected papers was evaluated and described using the Mixed Method Appraisal Tool (MMAT; Hong et al., 2018), which was chosen due to the heterogeneity of included studies in the integrative review (Hong et al., 2018; Whittemore and Knaf, 2005). The MMAT tool is useful in appraising the methodological quality of diverse research methods through a quality scoring system ranging from zero to 100 %, with higher scores indicating higher quality. This system reflects how the quality criteria are met. Two researchers (T.H., M.A.) evaluated the selected papers independently using the MMAT tool and any discrepancies were discussed to reach a final consensus on the rating (Hong et al., 2018.)

3.5. Analysis

In the first stage of the analysis, all the selected papers were read several times to get an overview of the entire data. Next, the nine studies were tabulated according to authors, publication year, purpose, design, participants, sample size, data collection and analysis method. The information about students' perceptions, their academic performance, and the factors associated with their academic performance in reviewed articles was identified and extracted from the data. The extracted data of the original units were analysed and interpreted by following the principles of inductive content analysis (Graneheim et al., 2017).

The extracted text was divided into meaning units that were condensed, coded, compared based on similarities and differences, and sorted into tentative subcategories. Through a discussion, the authors agreed on 12 subcategories that were further abstracted into five main categories that unified the content in the subcategories (Graneheim et al., 2017; Whittemore and Knaf, 2005). The results of the analysis are presented as a narrative synthesis (Whittemore and Knaf, 2005).

4. Results

4.1. Included studies' characteristics

Only studies where the authors of the primary studies named or described the programme's implementation as an online degree programme were included. The nine studies included in this review were published between 2007 and 2020 and represented four countries: the United States of America (USA; $n = 5$), Turkey ($n = 2$), Malaysia ($n = 1$), and Canada ($n = 1$). Fig. 1 depicts a flowchart documenting the literature search.

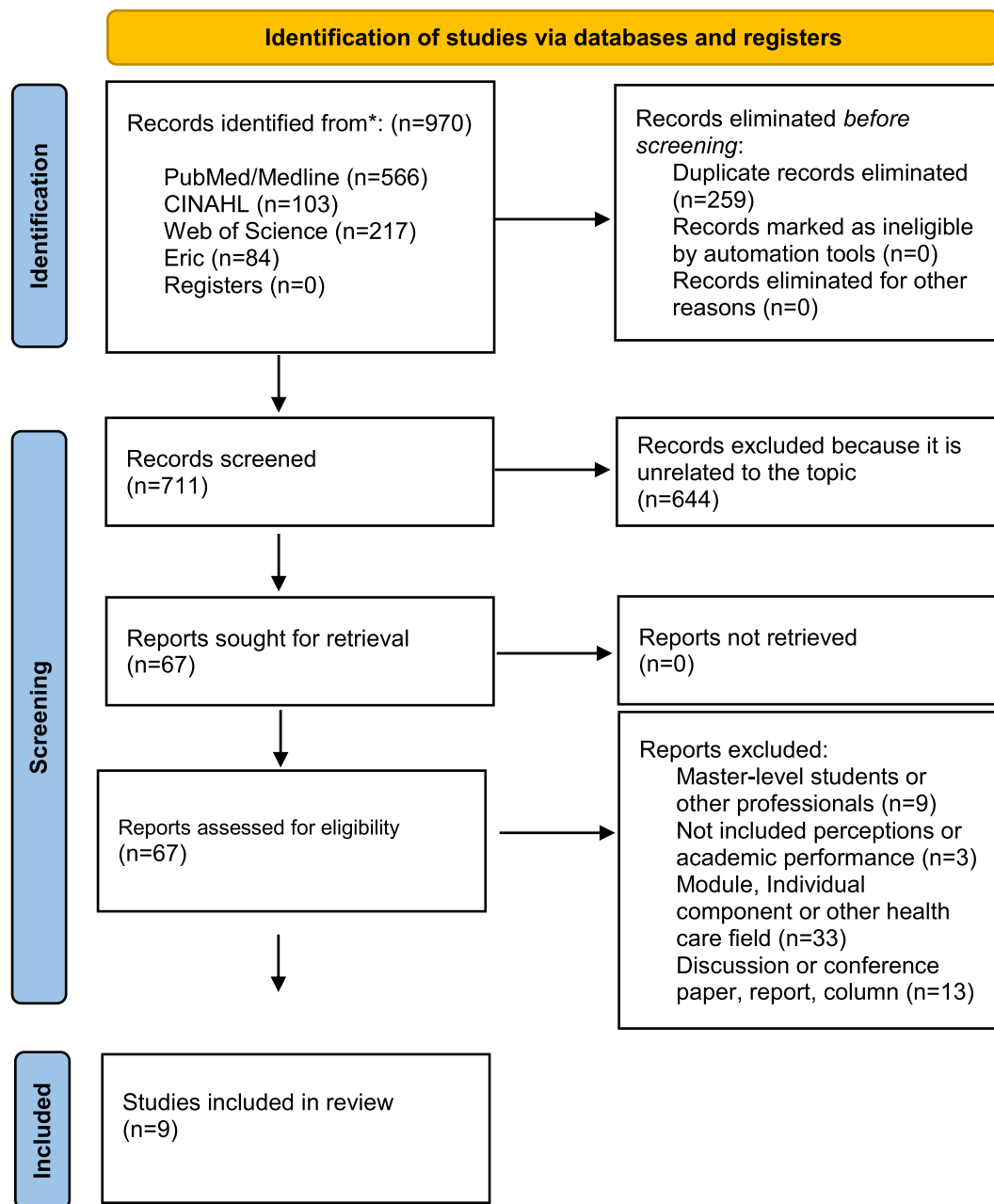


Fig. 1. Flow chart of the selection process.

The studies adopted the following designs: quasi-experimental (Haggard-Duff et al., 2020; Miller et al., 2018), comparative survey (Hampton et al., 2017), descriptive case study (Holley and Taylor, 2009; Karaman, 2011; Karaman et al., 2014), exploratory studies (Nininger et al., 2019), observational research (Oranye et al., 2012), and interpretive description methods (Russell et al., 2007; Table 1). Most study participants were bachelor's degree students who already held associate degrees. Their earlier associated education requirement was described as follows: registered nurse (RN) (Haggard-Duff et al., 2020; Hampton et al., 2017; Karaman, 2011; Karaman et al., 2014; Nininger et al., 2019), associate's degree and an unencumbered license to practice in the registered nursing field (Holley and Taylor, 2009), and practising nurse with a diploma certificate (Oranye et al., 2012).

The quality of the selected studies varied from 60 % to 100 % (Table 2), and no studies were excluded from the review based on quality assessment (Hong et al., 2018; Whittemore and Knaf, 2005). There were methodological limitations in the studies, such as a

relatively small sample size, low response rate, nonresponse bias not being reported, or confounders were not accounted for in the design or analysis. In addition, in some studies, there was a lack of a comparison group or pretest, or components of the qualitative and quantitative parts were not individually appraised.

Students' perceptions of online degree programmes were described in five studies (Haggard-Duff et al., 2020; Holley and Taylor, 2009; Karaman, 2011; Karaman et al., 2014; Russell et al., 2007). However, academic performance played a smaller role. Students' academic performance was assessed in terms of their self-efficacy (Miller et al., 2018), writing competency (Miller et al., 2018), clinical skills (Oranye et al., 2012), grade point average (GPA), and progression (Nininger et al., 2019). Along with these measurable quantities, authors of two studies described factors associated with learning based on students' experiences (Holley and Taylor, 2009; Karaman et al., 2014) and preferences for teaching methodologies (Hampton et al., 2017).

Table 1
Summary of studies ($n = 9$).

Author, year, country	Purpose	Design	Participants, sample size, data collection, analysis method	Findings of interest in this review
Haggard-Duff et al. (2020) USA	To examine whether the one-on-one, script-guided orientation phone calls with individual newly enrolled students provided valuable programmatic information and established a sense of connection to the faculty.	Quasi-experimental study	Newly enrolled students ($n = 108$) in online RN-to-BSN programme Survey Descriptive statistics analyses	Students' perceptions: Students perceived that one-on-one orientation telephone calls provided valuable programme overview information and the personal conversational format conveyed to remote students faculty availability and an enhanced sense of connectedness.
Hampton et al. (2017) USA	To understand student preferences in teaching/learning methods across generations and to understand which teaching strategies students considered the most engaging and effective.	Comparative survey	Students ($n = 56$) in online RN-to-BSN programme. Other participants who were not under the scope of this review included MSN participants ($n = 118$) and DNP ($n = 43$) students Survey Descriptive and inferential statistics analyses	Factors associated with academic performance: Teaching methods that are included as the top preferred methodologies are also rated as the most engaging and most effective for learning by students. The most engaging and most effective method for RN-to-BSN student learning was Case studies. Instructors' feedback helped students work harder.
Holley and Taylor (2009) USA	To examine the effects of faculty, peers, and professional colleagues on student experiences, what characteristics define knowledge acquisition and socialisation, and how undergraduate students invest in the online community in an online programme.	Descriptive case study	Students ($n = 19$) in online baccalaureate nursing (BSN) programme. Other participants who were not under the scope of this review included faculty members ($n = 4$). Semi-structured interviews and document analysis Content analysis	Students' perceptions: Students described their experiences as individualised and sometimes isolating. Student and faculty interactions were almost always linked to a particular task and students had little contact with their academic peers. The curriculum was valued for its potential to improve their positions within a professional community of practice. Existing community provided significant personal and professional support. Factors associated with academic performance: Motivation positively influenced students' learning. Reading and academic writing were especially important skills.
Karaman (2011) Turkey	To demonstrate students' perceptions of online continuing education and to determine perceptions of various groups; rural and urban work area groups, working settings based on where the students worked, frequency of computer usage and age.	Descriptive case study	Students ($n = 1041$) in online nursing bachelor's degree completion programme Survey Descriptive and inferential statistics analyses	Students' perceptions: Students have positive perceptions about online learning. Ages, lengths of working experience or place of living in urban or rural areas was insignificantly related to perceptions of online programmes. Perceptions differed significantly depending on the settings where they work and with the computer usage.
Karaman et al. (2014) Turkey.	To evaluate the online continuing education programme from the perspectives of graduated students. An evaluation framework includes five factors—namely programme and course structure, course materials, technology, support services, and assessment.	Descriptive case study	Students ($n = 2365$) in an online nursing bachelor completion degree programme Survey Descriptive statistics, content analysis	Students' perceptions: Students thought the programme was relatively useful and satisfactory in terms of the programme, course structure and materials. Students' views about the technology dimension were average and support services dimension were lower than the others. Participants expressed their satisfaction with exams. Factors associated with academic performance:
Miller et al. (2018) USA	To compare the implementation of a scaffolded sequence of writing assignments (intervention) to typical writing assignments (comparison) in the final coursework.	Quasi-experimental study	Students ($n = 78$; intervention group, $n = 51$; comparison group, $n = 27$) in baccalaureate nursing (BSN) online completion programme at two universities Two scales were used to assess writing samples. Descriptive and inferential statistics analyses	Course materials supported students learning. Factors associated with academic performance: A scaffolded sequence of writing assignments (intervention) with regular instructor's feedback and peer review process can improve writing competency compared to typical writing assignments (comparison) in final coursework. Significant group differences in writing competency as assessed by the 6 + 1 Trait scale rather than the Holistic scale. The two groups differed insignificantly in the pre to post self-efficacy scores. Writing self-efficacy scores and writing competency were insignificantly correlated.
Nininger et al.	To assess the preparation of RNs from institutions that lack national nursing	Exploratory study	Students ($n = 385$) from the institutions with ($n = 349$) national nursing	Factors associated with academic performance:

(continued on next page)

Table 1 (continued)

Author, year, country	Purpose	Design	Participants, sample size, data collection, analysis method	Findings of interest in this review
(2019) USA	accreditation by comparing their grade point average (GPA), on-time completion rate, and academic withdrawal to students from Institutions with National Nursing Accreditation		accreditation and without ($n = 36$) national nursing accreditation in the online RN-to-baccalaureate nursing (BSN) programme The bases for comparison were GPA, on-time completion rate, and academic withdrawal. Inferential statistics	Students from institutions lacking national nursing accreditation was prepared educational opportunities and academic progression. They had a higher on-time completion rate and a lower GPA than comparison groups. Differences in GPA were statistically insignificant ($p > .05$). Their (GPA, above level 3,5 average) represented good academic performance. Evidence regarding withdrawals was insufficient for adequate comparisons.
Oranye et al. (2012) Malaysia	To assess the levels of clinical skills competence of practising nursing students through OSCE and to determine the individual/group characteristics that affect clinical skills competence.	Observational study	Students ($n = 311$) in the online distance educational Bachelor of Nursing programme Nursing students' clinical skills were observed and scored in five OSCE stations. Two instruments including a self-administered questionnaire and a check list on the clinical skills used by the examiners were used. Descriptive and inferential statistics analyses	Factors associated with academic performance: Years of nursing practice were not correlated with the competency level in the online programme. Experience and post-basic qualifications did not guarantee excellent clinical skills performance. Results indicated variations in clinical skills related to nursing specialities and students' designation in the workplace.
Russell et al. (2007) Canada	To describe the communication experiences of Canadian faculty and Aboriginal students.	Interpretive description method	Aboriginal successful ($n = 61$) and unsuccessful ($n = 4$) students in an online baccalaureate nursing degree programme. Other participants who were not under the scope of this review included faculty members ($n = 12$). Focus group and individual interviews Content analysis and microlevel analysis	Students' perceptions: The discourses and experiences of the Aboriginal students reflected numerous instances of intercultural miscommunication. Contrasting assumptions about others and problematic interactions and situations affected the teaching-learning experiences within the course. When students and faculty connected, there were fewer negative attributions to faculty's comments; a better relationship between faculty and students was noted.

Note: RN-to-BSN: from registered nurse to Bachelor of Science in nursing; MSN: master's in nursing; DNP: Doctor of Nursing practice.

4.2. Students' perceptions of an online degree programme in nurse education

Nursing students' perceptions of online degree programmes in nurse education are described through the following categories: enabling career development, content delivered online, and community belonging (Fig. 2).

4.2.1. Enabling career development

Nursing students perceived that online degree programmes enabled their career development, describing opportunities for professional advancement and accessible programmes. *Opportunity for professional advancement* comprised the possibility of increasing one's status and achieving a bachelor-level degree. Students value the online degree programme as it presents a possibility of increasing one's status within the professional community and achieving professional advancement (Holley and Taylor, 2009; Karaman et al., 2014). Academic learning was appreciated through its application for students' professional careers (Holley and Taylor, 2009), and online continuing education programmes were seen as a good opportunity to achieve a bachelor-level degree (Karaman et al., 2014).

Accessible programmes comprised perceptions of a personal learning environment suitable for different career stages. The personal learning environment was described as offering the flexibility and time boundlessness that students valued (Holley and Taylor, 2009; Karaman, 2011; Karaman et al., 2014), and where learning is easy and accessible for students in both urban and rural areas (Karaman, 2011). Online learning opportunities were perceived as suitable for different career stages, irrespective of students' age or length of work experience as RNs. However, some differences were noted depending on students' work settings and computer usage (Karaman, 2011).

4.2.2. Content delivered online

Nursing students' perceptions of online degree programmes included those related to content delivered online, such as those related to beneficial programme implementation and ineffective digital content. Students' perceptions of *beneficial programme implementation* related to useful course content and exam accuracy. Valuable content comprised students' perceptions that the programme and course content were useful (Holley and Taylor, 2009; Karaman et al., 2014), and the course structure was satisfactory; additionally, many students found course materials in different formats informative (Karaman et al., 2014). Students appreciated exams that accurately evaluated their knowledge level and were consistent with course contents (Karaman et al., 2014).

Ineffective digital content comprised problems with technology and time-consuming e-learning environments. Problems with technology were related to situations where the technology failed (Karaman et al., 2014; Russell et al., 2007), meaning that students could not access class materials from distance-learning sites (Russell et al., 2007) or they had difficulties accessing systems during online exams (Karaman et al., 2014). A time-consuming e-learning environment meant that students were required to possess time management skills (Holley and Taylor, 2009; Karaman et al., 2014). Some students perceived the materials supplied in the e-learning environment to be excessively long and detailed (Karaman et al., 2014). Additionally, interactive technologies, such as discussion boards and group assignments, were often not highly valued because students had minimal contact with their academic peers and spent limited time on online course modules (Holley and Taylor, 2009).

4.2.3. Community belonging

Nursing students' perceptions of online degree programmes included their perceptions of community belonging, such as the availability of support from faculty, insufficient interaction with faculty and

Table 2
Quality rating of the selected studies' quality scores.

Qualitative studies	Is the qualitative approach appropriate to answer the research question?	Are the qualitative data collection methods adequate to address the research question?	Are the findings adequately derived from the data?	Do data sufficiently substantiate the interpretation of results?	Is there coherence between qualitative data sources, collection, analysis and interpretation?	Total	
Holley and Taylor	2009	Yes	Yes	Yes	Yes	100 %	
Russell et al.	2007	Yes	Yes	Yes	Yes	100 %	
Non-randomised studies	Are the participants representative of the target population?	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	Are there complete outcome data?	Are the confounders accounted for in the design and analysis?	Is the intervention administered (or exposure occurred) during the study period as intended?	Total	
Haggard Duff et al.	2020	Yes	No	Yes	No	Yes	60 %
Miller et al.	2018	Yes	Yes	Yes	No	Yes	80 %
Quantitative descriptive studies	Is the sampling strategy relevant to address the research question?	Is the sample representative of the target population?	Are the measurements appropriate?	Is the risk of nonresponse bias low?	Is the statistical analysis appropriate to answer the research question?	Total	
Hampton et al.	2017	Yes	No	Yes	No	Yes	60 %
Karaman	2011	Yes	Can't tell	Yes	No	Yes	60 %
Nininger et al.	2019	Yes	No	Yes	Yes	Yes	80 %
Oranye et al.	2012	Yes	Yes	Yes	No	Yes	80 %
Mixed methods studies	Is there an adequate rationale for using a mixed methods design to address the research question?	Are the different components of the study effectively integrated to answer the research question?	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	Total	
Karaman et al.	2014	Yes	Yes	Yes	Yes	No	80 %

interaction among peers. The category *Availability of support from faculty* related to students' appreciation of faculty who provided individualised attention, responded rapidly to their inquiries and travelled to distance education sites. Students appreciated attentive faculty members (Haggard-Duff et al., 2020; Karaman et al., 2014; Russell et al., 2007): the orientation phone calls received at the beginning of one programme resulted in them feeling a 'sense of connectedness' with the faculty member (Haggard-Duff et al., 2020). Students also valued faculty members who expected each distance education site to contribute during class and when they took the time to ensure that students at each site had their questions answered before the end of a class (Russell et al., 2007). In addition, rapid responses to students' inquiries were appreciated (Karaman et al., 2014; Russell et al., 2007); when faculty responded rapidly to an inquiry, they felt that the faculty member understood them and their communication needs (Russell et al., 2007). Moreover, students recommended that educators travel from the main campus to distance education sites to get to know them and learn about their culture (Russell et al., 2007).

Students also had perceptions of *Insufficient interaction with faculty*, which comprised rare interactions and negative assumptions regarding faculty. Rare interaction related to having only limited interaction with faculty (Holley and Taylor, 2009; Karaman et al., 2014; Russell et al., 2007) beyond electronic communication (Holley and Taylor, 2009) or interactions with faculty being deficient (Karaman et al., 2014), highly selective, or linked only to a particular task (Holley and Taylor, 2009). Students occasionally felt isolated (Holley and Taylor, 2009; Russell

et al., 2007) and ignored when they did not have sufficient contact with faculty (Russell et al., 2007). Negative assumptions reflected students' attitudes toward and assumptions about faculty when they felt poorly treated (Russell et al., 2007).

Perceptions of *Interaction among peers* related to support from peers and professional communities, as well as a lack of connection and negative beliefs regarding class sites. Support from peers in students' home communities was perceived as valuable: students believed that knowing students in their home communities enabled them to receive help in problematic situations (Russell et al., 2007). For students working as registered nurses, their professional identity and knowledge were facilitated through perceived personal and professional support from professional communities (Holley and Taylor, 2009). In contrast, a lack of connection with classmates (Holley and Taylor, 2009; Russell et al., 2007) from other distance education sites led to loneliness, frustration, and discouragement (Russell et al., 2007). Limited peer interaction affected how students perceived their learning experiences (Holley and Taylor, 2009). Negative beliefs about different class sites consisted of students' assumptions regarding rivalries between sites and their experiences of disadvantages at these sites compared to the main campus (Russell et al., 2007).

4.3. Nursing students' academic performance

The reviewed studies provided information regarding students' academic performance in online degrees based on self-evaluations of their

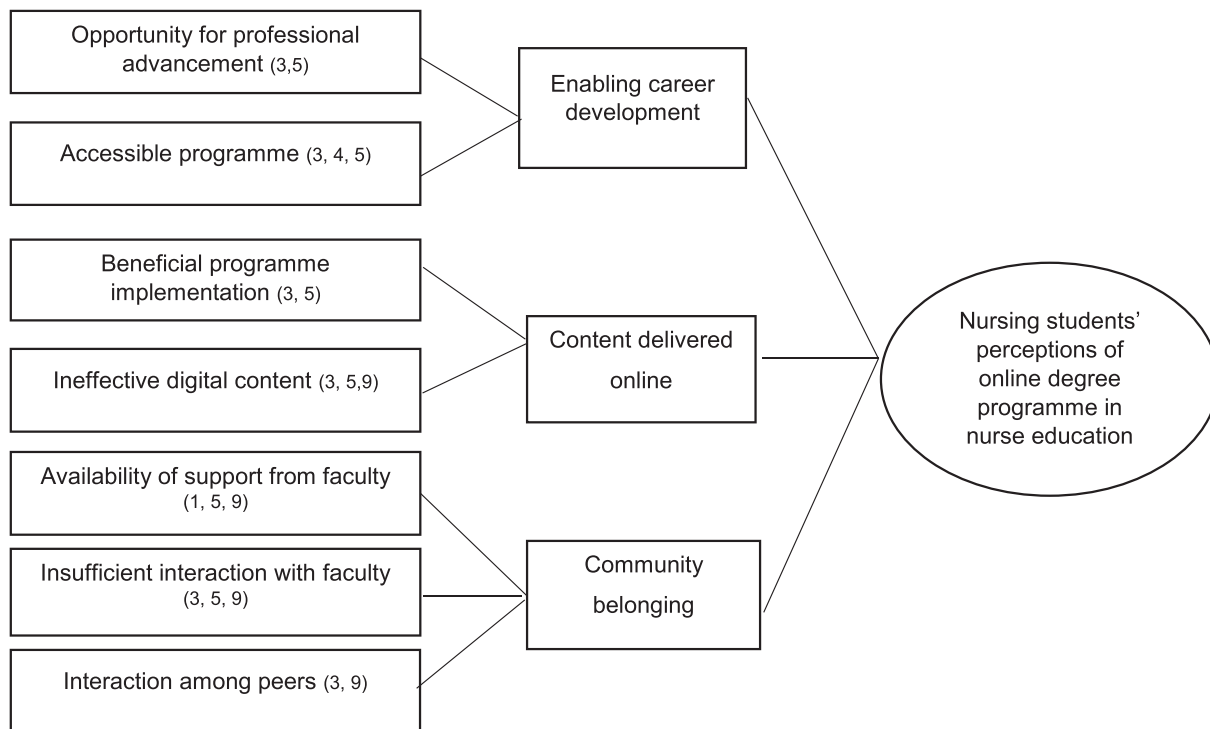


Fig. 2. Nursing students' perceptions of online degree programme in nurse education.

writing self-efficacy (Miller et al., 2018), assessment of their writing competency (Miller et al., 2018), clinical skills performance through an objective structured clinical examination (Oranye et al., 2012), performance based on grade point average, and progression (i.e., completion rate, academic withdrawal) (Nininger et al., 2019). Changes in students' writing self-efficacy were determined using pre- and post-self-evaluations to ascertain their confidence level in writing tasks and assess changes in their writing competency after a writing intervention (Miller et al., 2018). Students' performance concerning clinical skills was evaluated through an objective structured clinical examination, wherein 13.8 % of the participants achieved Level 4 competency (excellent clinical performance), and 11.6 % achieved Level 1 competency, that is, performed below a pass level (Oranye et al., 2012). Nininger et al. (2019) compared students admitted to online programmes by exception (matriculated from institutions lacking

discipline-specific accreditation) with those who met conventional admission standards. In both groups, students' GPAs were above 3.5 in all comparisons (satisfactory academic performance); however, students who met conventional admission standards had a higher average GPA, although the differences were statistically insignificant ($p > .05$). Meanwhile, the students admitted by exception had higher on-time completion rates. Evidence regarding academic withdrawal rates was insufficient for comparison.

4.4. Factors associated with nursing students' academic performance

The factors associated with students' academic performance in online degree programmes in nurse education were classified into the following categories: students' individual characteristics and the characteristics of the online learning environment (Fig. 3).

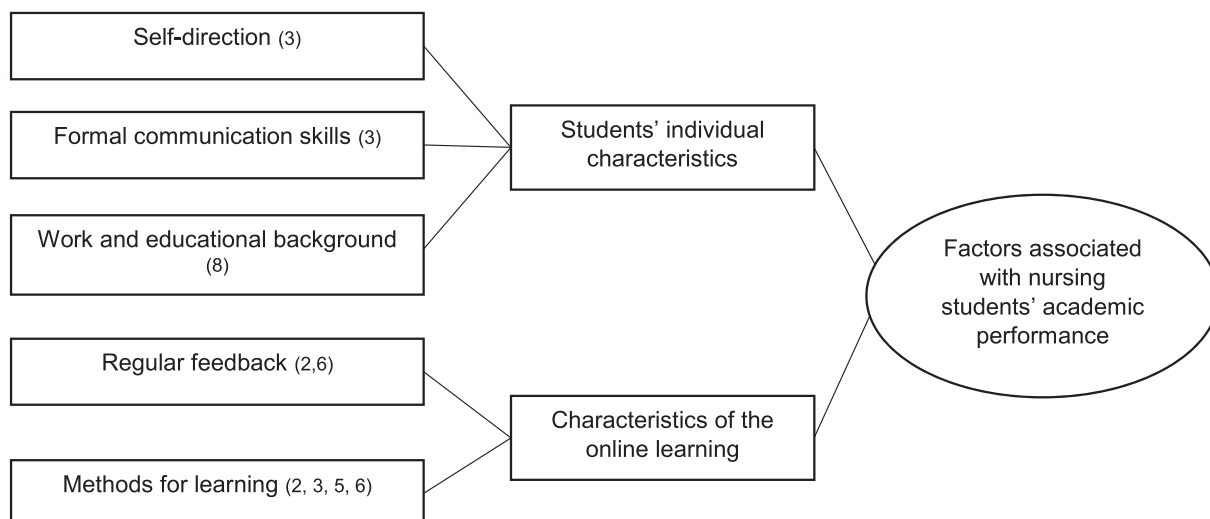


Fig. 3. Factors associated with nursing students' academic performance.

4.4.1. Students' individual characteristics

Students' individual characteristics that were associated with students' academic performance included self-direction, formal communication skills, and work and educational backgrounds. Students' *self-direction*, including motivation and responsibility, was associated with learning as the independent structure of online programmes requires students to take individual responsibility to acquire knowledge (Holley and Taylor, 2009). *Formal communication skills*, including reading and academic writing, were highlighted because online environments significantly emphasise formal communication (Holley and Taylor, 2009). Because of the diverse educational settings, educational organisations and national approaches of the countries students' *work and educational backgrounds* may vary. Their individual work and educational backgrounds comprised workplace designation (Oranye et al., 2012) and current nursing practice specialisation (Oranye et al., 2012). Some nursing students performed better than others. Differences in clinical skill performance among student participants were observed, depending on their workplace designation and current specialisation (Oranye et al., 2012).

4.4.2. Characteristics of the online learning environment

The characteristics of the online learning environment included regular feedback and methods for learning. *Regular feedback* referred to both educator feedback and the peer review process. *Regular feedback* from educators pushed students to work harder (Hampton et al., 2017; Miller et al., 2018), and detailed feedback, paired with structured assignments, was found to be necessary for students' writing competency (Miller et al., 2018). Additionally, the peer review process provided numerous benefits to students regarding writing competency (Miller et al., 2018).

The analysed data describing *Methods for learning* referred to course materials and learning methods. Course materials supported individual learning (Holley and Taylor, 2009; Karaman et al., 2014), and both audio-visual (Karaman et al., 2014) and text components (e.g., textbooks, notes, and PowerPoint summaries) were found to be significant for student learning (Holley and Taylor, 2009). Students' preferred learning methods—such as PowerPoint presentations converted to videos/voiceovers—were rated as the most engaging and effective for learning (Hampton et al., 2017). It is crucial for students that the topic is significant to evidence-based health care practices (Hampton et al., 2017; Miller et al., 2018), and students were reported to be most engaged when the learning content was relevant to their work or healthcare environment (Hampton et al., 2017). Other preferred, engaging, and effective teaching methods for learning included online discussion boards, assigned reading from journals, e-mail dialogues with instructors, internet searches and quizzes (Hampton et al., 2017), and written assignments, moving from a simple scope to larger themes on the selected evidence-based practice topic (Miller et al., 2018).

5. Discussion

In this review, we elucidated students' perceptions of online degree programmes in nurse education, where the theoretical content is delivered online. The reviewed studies evaluated academic performance based on students' writing self-efficacy, writing competency, clinical skills performance, GPA performance, and progression. The factors associated with students' academic performance were related to their individual characteristics and those of the online learning environment. Some methodological limitations were identified from the quality appraisal, particularly in the small samples and nonresponse bias.

An accessible bachelor-level online degree programme provides a personal learning environment for students in both urban and rural areas at different stages of their careers. Considering the pressing nursing shortage (World Health Organization, 2020), flexible methods for delivering nurse education and developing a university-educated workforce must be considered. Research has indicated that a greater

proportion of professional nurses in the workforce is associated with significantly lower mortality, quality patient care, and fewer adverse outcomes (Aiken et al., 2017; Yakusheva et al., 2014). While the results provide valuable insight into the benefits of online degree programmes in nurse education, most participants in the reviewed studies were bachelor's degree students with an associate degree. Therefore, in future, online degree programmes in undergraduate nurse education without an earlier associate degree should be further investigated.

Online programmes provide an alternative form of nurse education; however, considering the challenges with online content, insufficient interaction with faculty, and the lack of community among peers, attention must be paid to promoting positive student learning experiences. From a student's perspective, the online environment can be frustrating if valuable time must be used to solve technical problems, if course navigation does not facilitate ease of use, or if interaction with faculty or peers is unsatisfactory. Special support should be provided to developing technologies to develop online education further. Technical difficulties are common in digital learning interventions in various higher education disciplines, precipitating worst-case scenarios in which no learning experience is offered (Sormunen et al., 2020). Students in fully online programs have unique needs, and educators must utilise specific strategies to support them (Chicca and Matthias, 2023). Effective support (Chicca and Matthias, 2023; Haggard-Duff et al., 2020; Karaman et al., 2014; Russell et al., 2007) and technological infrastructure (Karaman et al., 2014) must be ensured. Moreover, avoiding miscommunication related to technology use must be emphasised (Russell et al., 2007).

It is important to promote support, community building, and togetherness to address the challenge posed by insufficient interaction. Students appreciate the flexibility that an online degree provides. However, simultaneously, they appreciate that their educator's attentiveness is ensured and that they are met individually despite the long distances. Therefore, focusing on solutions that promote student–faculty interaction—irrespective of a student's independent role—is crucial. Earlier research has highlighted the importance of the availability of systematic support, while faculty–student interactions have reduced the risk of dropping out of an online course (Gazza and Hunker, 2014; Yuan and Kim, 2014).

Additionally, the lack of a sense of community among students may emerge in online learning environments. Communication and relationships are more difficult in online education than face-to-face settings (Smith et al., 2021). If the level of interaction remains insufficient, the advantages related to independence may become an experience of isolation from peers or, in the worst case, even from educational institutions.

Factors associated with academic performance are related to both students themselves and the online learning environment. However, the scattered nature of evidence makes interpreting the characteristics challenging. A quantitatively evaluated relationship between students' characteristics (e.g., motivation) and their study performance (e.g., test results) could not be determined. Previous research has revealed that emotions, feelings, and finding value in an experience are related to nursing students' engagement (Chan et al., 2021). Engagement is vital for students to achieve desirable learning outcomes in academic settings (Elshami et al., 2022; Hampton and Pearce, 2016; Hensley et al., 2021; Martin and Bolliger, 2018), especially in an online environment where they may feel isolated (Dixson, 2015). When learners have autonomy over their learning process, they must control it to learn successfully (Jansen et al., 2022). Future studies should consider employing mixed methods to obtain a panoramic view of how different factors in online learning programmes are associated with student performance.

Furthermore, reading and writing skills were important in this review. However, evidence regarding the development of students' oral or interactional skills during the online degree programmes was not identified. In other studies, students with a strong and established foundation in writing skills have been found to be more successful in written

and oral communication during their nursing programmes and careers (Hawks et al., 2016).

We could not clearly identify the optimal teaching methods in online degree programmes for students' learning outcomes. However, faculties should use various teaching methods to promote students' learning. Earlier research indicated that the methods students prefer are also rated as the most engaging and effective for learning (Hampton et al., 2017). Online teaching requires a different skillset and approach than traditional face-to-face teaching (Ahern and Biedermann, 2022), and an evaluation of how topics such as physical examinations and procedural skills can be taught via online platforms is required (Roberts and Rizolo, 2023). Digital pedagogy requires pedagogical competence, where an educator uses digital technology in teaching and learning while considering student-centred learning during digitalisation without neglecting ethical issues (Sormunen et al., 2020). Educators' digital pedagogy competence in online nursing degrees should be further explored.

There is lack of consistency and strong study designs such as intervention studies on the evaluation of students' academic performance in online degree programmes. Accordingly, there is a need to develop and adopt strategies to ensure student competence, including practical outcomes such as technical skills. Owing to the academic gap, students' competencies at different stages and the long-term outcomes of education programmes should be considered to provide a more complete picture of the overall effectiveness of online degree programmes.

6. Limitations

This review has limitations related to the search strategy, study participants, rapid changes in online education, quality of the selected studies, and the variation of online programme implementation. Although the search phrases were formed with a library information specialist and conducted systematically, some studies may not have been included in these searches. The data search was limited to English articles; some relevant articles may not have been identified. Most participants in the identified studies were bachelor's degree students with an associate degree. Consequently, participants' earlier experiences may have influenced these findings and must be cautiously generalised. The reviewed studies were predominantly published before the global COVID-19 outbreak; studies conducted during the pandemic were not identified, and there may have been rapid developments affecting the quality of online learning that were not discussed in this review. The quality of the selected studies varied: the quality appraisal identified weaknesses in the studies' samples, methods, and designs. Studies where the authors named the programme as an online degree programme were included in the review. However, the articles did not clearly describe the implementation of these programmes; therefore, their content and programme delivery methods may vary.

7. Conclusions

Online degree programmes in nurse education significantly contribute to developing programme delivery practices for learning through a pedagogy that supports satisfactory work-life balance and optimises students' positive experiences. Students' academic performance is affected by both individual and environmental factors. However, a more coherent view of the factors associated with student success in online programmes, graduating students' competence, and the long-term outcomes of online programmes is needed to ensure that graduating students' performance meets the competence requirements for high-quality care. The study findings of this review have implications for educators developing and adopting strategies to advance digital environments with the pedagogy that supports community building in order to meet the needs of individual students. A gap still exists in academic studies regarding how online programmes are associated with students' competence, which is the foundation for safe, ethical, and high-quality

care. This gap must be addressed in future research.

CRedit authorship contribution statement

Tanja Hakkarainen: Writing – original draft, Validation, Methodology, Formal analysis, Data curation, Conceptualization. **Leena Salminen:** Writing – review & editing, Validation, Supervision, Methodology, Conceptualization. **Mika Alastalo:** Writing – review & editing, Validation, Methodology. **Heli Virtanen:** Writing – review & editing, Validation, Supervision, Methodology, Conceptualization.

Declaration of competing interest

The authors state there is no conflict of interest.

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