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REVIEW

Retention of newly graduated registered nurses in the hospital setting: A systematic review

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Abstract

Background: There is a gap in the literature on identifying and describing effective interventions for the retention of newly graduated registered nurses in hospital settings. To the best of our knowledge, no systematic review has been conducted on this issue.

Aim: To identify effective interventions that promote the retention of newly graduated registered nurses in the hospital setting and their components.

Design: A systematic review was conducted according to PRISMA 2020 Statement.

Methods: Information derived from the PubMed, CINAHL, Scopus, PsycINFO and Cochrane Library databases was reviewed, for the period January 2012–October 2022. Screening, data extraction and quality appraisal were conducted independently by two reviewers. The Joanna Briggs Institute Critical Appraisal tools were used for descriptive, quasi-experimental and cohort studies. Disagreements between the two reviewers were resolved through discussion.

Results: Following the critical appraisal, nine studies were included. The evidence reveals the heterogeneity of programmes developed in the hospital context to promote the retention of newly graduated registered nurses, clarifies the three competencies to be addressed (core, cross-cutting and specific), their components (programme development framework, duration, content and support components), and shows significant improvements after their implementation.

Conclusions: This systematic review identifies that either nurse residency or individualised mentoring programmes, lasting 1 year, and multi-component, addressing core and specific competencies and including preceptor or mentor components seem to be the most comprehensive and effective in promoting the retention of new nurses in the hospital setting.

Relevance to Clinical Practice: The knowledge provided by this review will contribute to developing and implementing more effective and context-specific strategies directed at retaining newly graduated registered nurses and subsequently enhancing patient safety and healthcare costs.

No Patient or Public Contribution: Given the study design and focus.

KEYWORDS
intervention, nursing, personnel turnover, review literature

JEL CLASSIFICATION
Advanced Nursing Practice, Chronic Illness, Clinical Decision-Making, Clinical Nurse Specialist, Leadership, Qualitative Study

1 | INTRODUCTION

Nurse turnover refers to the phenomenon of competent nurses voluntarily resigning from their jobs and joining new ones (Nurdiana & Hariyati, 2018). As stated by Kurnat-Thoma et al. (2017), some degree of turnover is to be expected and healthy, with an optimal level in nursing of between 5% and 10% (Gilles, 1996). The turnover rate is higher, ranging between 12% and 44% globally (Dewanto & Wardhani, 2018), a phenomenon that has magnified during the COVID-19 pandemic. Indeed, this pandemic has been a major disruptor in nurse retention and effectively contributed to increased burnout and the associated risks of higher nurse turnover (Buchan et al., 2022).

High nurse turnover is, understandably, one of the main problems in health care systems, posing a challenge for organisational leaders due to its negative impact on efficiency, cost-effectiveness, quality of care and patient safety (Halter et al., 2017). A recent report on nurse turnover in the United States noted that the average cost of turnover for a bedside registered nurse (RN) is $52,350, a 13.5% increase, resulting in the average hospital losing between $6.6 million and $10.5 million. Each percent change in RN turnover will cost/save the average hospital an additional $380,600/year (NSI Nursing Solutions, Inc, 2023). In addition, high nurse turnover is associated with increased patient complications and higher readmission and mortality rates (Kim et al., 2019). It also leads to nursing shortages (Buchan et al., 2022), which in turn increases the chances of medical errors, patient dissatisfaction, stress and heavy workload for nurses receiving new staff requiring orientation and training (Mosadeghrad, 2013). This can further increase the turnover rate, creating a vicious cycle (Kurnat-Thoma et al., 2017).

The main causes of this phenomenon include low staffing levels, job dissatisfaction, lack of commitment to the organisation, lack of career development opportunities and negative interdisciplinary relationships (Hayward et al., 2016; Neeley, 2017; Shin et al., 2018). Other authors point to critically ill patient care, poor professional environments, negative work climate, difficulty in reconciling work and family life and poor supervisor support as causes of turnover (Cao et al., 2021; Sharififard et al., 2019).

The difficulty of retention is more pronounced in newly graduated registered nurses (NGRNs) (Bontrager et al., 2016; Yun & Yu, 2020), considered as nurses who enter clinical practice without previous experience of how to manage patient care or job responsibility without help, and who are unfamiliar with organisational procedures, policies, protocols and tools used for delivering patient care (Kurnat-Thoma et al., 2017). According to a Robert Wood Johnson Foundation-funded 10-year panel study of NGRNs in the United States, approximately 17.5% of these nurses change jobs during their first year of employment (Kovner et al., 2014). The Joint Commission report, undertaken in the United Kingdom (2010) reported that one in four NGRNs plan to leave their first posts within the first 12 months after registration.

What does this paper contribute to the wider global clinical community?

- This systematic review sheds light on developing and implementing more effective and context-specific strategies directed at retaining NGRNs and subsequently enhancing patient safety and healthcare costs.
- The results suggest that either nurse residency or individualised mentoring programmes, lasting 1 year, address core and specific competencies and include preceptor or mentorship for successful programmes development and implementation.
- The findings of this review have great interest in remedying the global nurse shortage gap and provide a wake-up call to managers to periodically investigate nurses' turnover intentions through turnover and retention rate indicators, a self-report survey or interviewing nurses.

Various initiatives have been taken to reduce this high turnover of nurses or to promote their retention. On the one hand, the report 'Strengthening Nurses and Midwives' calls for the implementation of comprehensive human resource development programmes to support their training, recruitment and retention in health services (World Health Organization, 2001), with the shortage of nurses expected to increase by 2025 (Roche et al., 2015). In turn, the Institute of Medicine (IOM), in its report on the future of nursing, explores how the roles, responsibilities and education of nurses must change in practice, education and leadership so as to meet the changing demands of the health care system in the United States and to attract and retain well-prepared nurses (IOM, 2011). For its part, the International Council of Nurses (ICN) stresses that the retention of new nurses must be a priority worldwide, with a focus on developing their professional roles and encouraging them to take on more leadership roles (Howard, 2019). Finally, the global Nursing Now campaign, launched in collaboration between the ICN and the World Health Organization (WHO) with the support of the Burdett Trust for Nursing, focuses on developing recruitment and retention strategies for younger generations of nurses, such as NGRNs (Salvage et al., 2019).

TABLE 1 Search strategy used in electronic databases.

Database	Keyword	*n*
Pubmed	(((Nurs*) AND (("personnel turnover" OR "intention to leave") OR ("personnel turnover"[MeSH Terms]))) OR (retention OR "intention to stay")) AND (strategies OR interventions OR programs)	1150
Cinahl	((MH "Personnel Turnover") OR "personnel turnover" OR "intention to leave" OR retention OR "intention to stay") AND nurs* AND (interventions OR strategies OR programs)	1274
PsycInfo	nurs* AND ("personnel turnover" OR "intention to leave" OR retention OR "intention to stay") AND (interventions OR strategies OR programs)	310
Scopus	(TITLE-ABS-KEY (nurs* AND ("personnel turnover" OR "intention to leave" OR retention OR "intention to stay"))) AND (TITLE-ABS-KEY (interventions OR strategies OR programs))	380
Cochrane Library	(MeSH descriptor: [Personnel Turnover] OR "personnel turnover" OR "intention to leave") AND nurs* AND (interventions OR strategies OR programs) AND (retention OR "intention to stay")	24
	Total	3138

TABLE 2 Criteria for the selection of studies.

Inclusion criteria	Exclusion criteria
Nurses who worked in the hospital setting. Generalist nurse Newly graduated registered nurses	Nurses who worked in the outpatient setting, in special units (ICU, emergency room, operating theatre) or in outside the clinical setting (e.g. in the academic setting)
Interventions or strategies to support nurse retention with primary outcomes on attrition/retention/turnover rates reported	Interventions aimed at nursing students or other profiles (e.g. supervisors, advanced practice nurses)
Primary research on interventions to support nurse retention (experimental, quasi-experimental and cohort studies)	Studies with a qualitative approach. Grey literature (editorials, opinion articles and conference publications)

In recent years, there has been a growing interest in exploring the effectiveness of strategies to improve the retention of NGRNs (Asber, 2019; Pertiwi & Hariyati, 2019; Van Camp & Chappy, 2017) and their characteristics (Brook et al., 2019). However, there is a gap in the literature on identifying and describing effective interventions for the retention of NGRNs in hospital settings. To the best of our knowledge, no systematic review has been conducted on this issue. Context is known to influence the retention of NGRNs (Monroe et al., 2020; Kaldal et al., 2022). In hospital settings, where care is increasingly complex, with more demanding and high-acuity patients, faster discharges and staff shortages, the care process is intensified. This fact leads to quicker burnout for nurses and subsequent premature attrition, affecting the retention and performance of NGRNs (Mills et al., 2017). Understanding the interventions that support the retention of NGRNs in this context can therefore help to design and implement effective strategies that impact organisations by increasing patient safety and reducing healthcare costs.

2 | THE REVIEW

2.1 | Aim

The aim of this systematic review is to identify the effective interventions that promote the retention of NGRNs in the hospital setting and their components.

2.2 | Design

A systematic review of the most recent literature using a Preferred Reporting Items for Systematic Reviews and Meta-Analyses guideline for reporting (Page et al., 2021) was carried out (Table S1). A review protocol was created, and the review was registered and confirmed by Prospero with the code CRD42022354841, which is an international prospective register of systematic reviews (Table S2). The PICO format was used to formulate the research question that guided this review (Munn et al., 2018):

What strategies support the retention of new nurses?

P: Population: Newly graduated registered nurses.

I: Intervention: Interventions.

C: Comparison: Not applicable.

O: Outcome: To favour retention and/or decrease turnover.

2.3 | Search methods

Electronic searches were conducted in the main electronic databases, PubMed, CINAHL, Scopus, PsycINFO and Cochrane Library, for the period January 2012–October 2022. In these searches, as illustrated in Table 1, the terms "Nurses", "Interventions", and "Retention" and their synonyms were combined with the Boolean operators OR and AND. Search terms were confirmed with an academic librarian. To improve the sensitivity of the search and to avoid omitting relevant studies, MeSH terms and keywords identified in

the selected studies were used. Limits were applied to the bibliographic search: the date of publication, reviewing the last 10 years to ensure that the search was current and up to date, and the language of publication, selecting articles published in English or Spanish, both languages in which the researchers and academic librarian alike are proficient. Finally, the search was completed with the 'snowball' strategy by reviewing the reference lists of all selected studies and identifying possible additional papers. Table 2 presents the selection criteria applied for this review.

2.4 | Quality appraisal

The selected studies were independently evaluated by two authors (MV-C and MCE-A) according to the methodological quality criteria described by the JBI (Joanna Briggs Institute) for descriptive, quasi-experimental and cohort studies, consisting of 8 and 11 items (Moola et al., 2020; Tufanaru et al., 2020). A total score was calculated by summing the 'yes' items, giving each study a score between zero and the total number of items evaluated in each checklist. Disagreements between the two reviewers were resolved through peer-to-peer discussion. There was only minor disagreement on the individual evaluation of Item 7 of a quasi-experimental study concerning 'the outcomes of participants included in any comparisons measured in the same way', which was resolved after discussion. While one of the researchers had answered 'no', the other had considered it 'doubtful' because, although it did not appear in the study, nor was it explicitly stated (Table 3). Hence, no studies were excluded from the review. Due to the type of study identified, the risk of bias could not be assessed (Higgins et al., 2011).

2.5 | Data abstraction and synthesis

The data collected from the studies were the following: country of origin and year; objective, design and sample size of the study; characteristics of the intervention; instruments used to assess the effectiveness of the interventions; main outcomes of the interventions; and methodological quality of the studies. This analysis was first performed by the two researchers separately (MV-C and MCE-A), and then jointly compared, contrasted and clarified before reaching a consensus on the findings.

TABLE 3 Methodological quality of included studies (JBI, 2020).

Studies	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
JBI critical appraisal checklist for quasi-experimental studies[a]											
Chen et al. (2021)	Y	Y	Y	N	Y	Y	D	Y	Y		
Hu et al. (2015)	Y	Y	Y	Y	N	Y	Y	Y	Y		
Koneri et al. (2021)	Y	Y	Y	Y	Y	N	Y	Y	Y		
Krofft and Stuart (2021)	Y	Y	N	N	N	Y	Y	Y	N		
Torres et al. (2021)	Y	Y	Y	N	Y	Y	Y	N	N		
Wolford et al. (2019)	Y	N	Y	Y	Y	N	Y	Y	Y		
Zhang et al. (2019)	Y	Y	Y	Y	Y	Y	Y	Y	Y		
JBI critical appraisal checklist for descriptive studies[b]											
Shinners et al. (2021)	N	N	Y	N	Y	N	Y	Y	Y		
JBI critical appraisal checklist for cohort studies[c]											
Pillai et al. (2018)	Y	Y	Y	N	N	Y	Y	Y	Y	Y	N

Abbreviations: D, doubtful; N, no; Y, yes.

[a]Q1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)? Q2.Were the participants included in any comparisons similar? Q3.Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest? Q4.Was there a control group? Q5.Were there multiple measurements of the outcome both pre and post the intervention/exposure? Q6.Was follow-up complete and if not, were differences between groups in terms of their follow-up adequately described and analysed? Q7.Were the outcomes of participants included in any comparisons measured in the same way? Q8.Were outcomes measured in a reliable way? Q9.Was appropriate statistical analysis used?

[b]Q1.Was the sample frame appropriate to address the target population? Q2.Were study participants sampled in an appropriate way? Q3.Was the sample size adequate? Q4.Were the study subjects and the setting described in detail? Q5.Was the data analysis conducted with sufficient coverage of the identified sample? Q6.Were valid methods used for the identification of the condition? Q7.Was the condition measured in a standard, reliable way for all participants? Q8.Was there appropriate statistical analysis? Q9.Was the response rate adequate, and if not, was the low response rate managed appropriately?

[c]Q1.Were the two groups similar and recruited from the same population? Q2.Were the exposures measured similarly to assign people to both exposed and unexposed groups? Q3.Was the exposure measured in a valid and reliable way? Q4.Were confounding factors identified? Q5.Were strategies to deal with confounding factors stated? Q6.Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)? Q7.Were the outcomes measured in a valid and reliable way? Q8.Was the follow-up time reported and sufficient to be long enough for outcomes to occur? Q9. Was follow-up complete, and if not, were the reasons to loss to follow-up described and explored? Q10.Were strategies to address incomplete follow-up used? Q11.Was appropriate statistical analysis used?

3 | RESULTS

3.1 | The search results

The search of the different databases yielded 3146 articles. The selection was carried out systematically. First, after eliminating duplicates the sample was reduced to 2788. After reading the title and abstract, only 37 remained. After a complete reading of the text and applying selection criteria to the articles, 29 were eliminated, resulting in 8 studies for the analysis of the results, including one additional study identified through snowballing. Two researchers were involved in this process, first independently, then together. The flow chart of this process is shown in Figure 1.

3.2 | Research characteristics

Table 4 presents the main characteristics of the studies selected for this review. Of the nine articles included in the review, seven were quasi-experimental, one cohort and one descriptive. The studies were mostly conducted in the United States ($n=6$), and the other three were conducted in China. Two of the studies from the United States were carried out during the onset of the pandemic, even as the authors noted that they had not made any core modifications to the programme components (Krofft & Stuart, 2021; Shinners et al., 2021). Three studies provided data on the mean age of NGRNs participating in the intervention, 23 years old approximately.

The narrative summary presents first the studies analysed according to the assignation of the authors to the intervention (descriptions of the different types of interventions are provided in Table 4). Second, due to considerable overlap between different types of interventions, it shows the studies analysed based on types of intervention, competencies addressed, components and impact on nurse retention and turnover (Table 5).

3.3 | Types of interventions

Types of interventions that were most frequent in this review are combined ($n=4$), residency programmes ($n=3$) and individualised mentoring ($n=1$), as well as diversified adaptive education ($n=1$). These types of interventions are reflected in Tables 4 and 5.

3.3.1 | Residency programmes

Three studies implemented residency programmes to ease the transition of NGRNs into the hospital practice setting, where patients may deteriorate, and levels of stress and risk of unsafe practice are high (Pillai et al., 2018; Shinners et al., 2021;

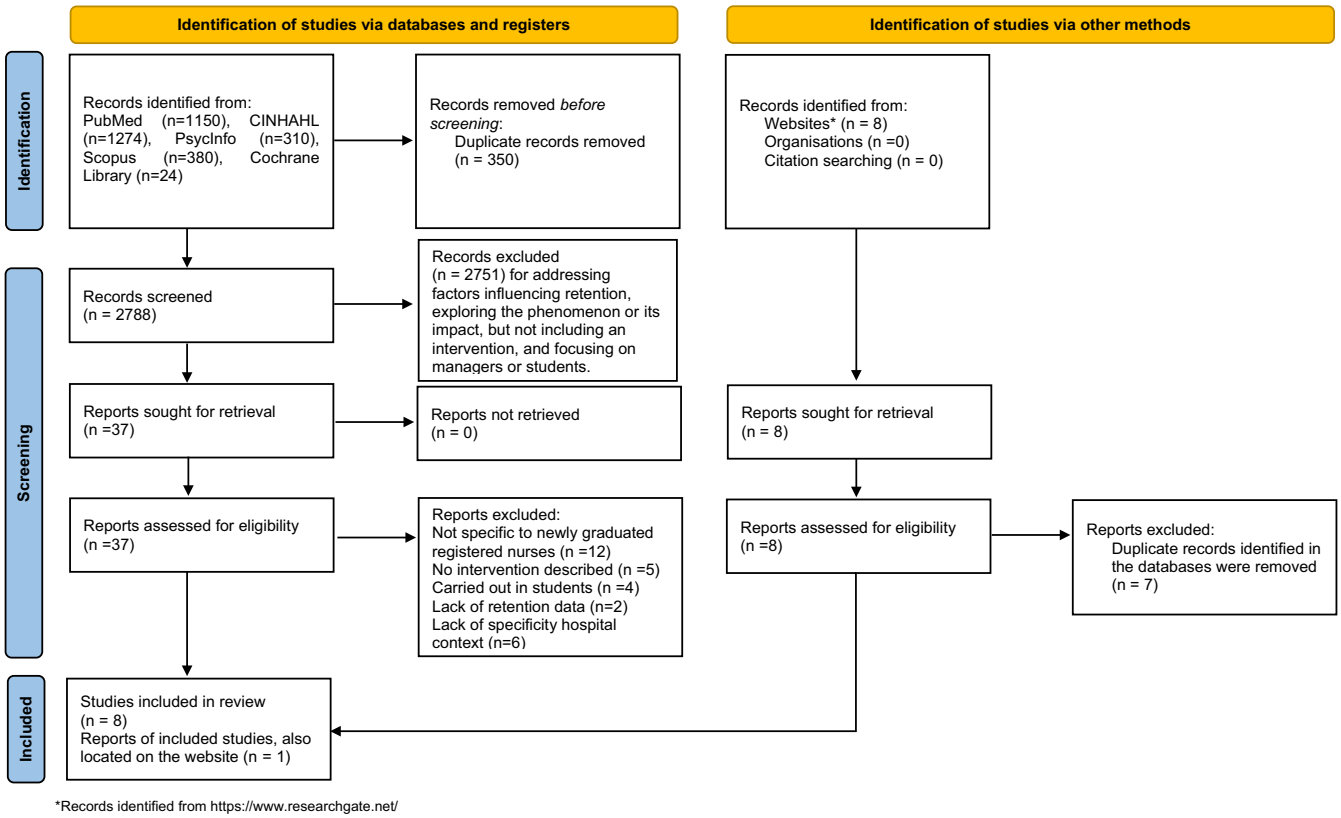

FIGURE 1 PRISMA 2020 flow chart of the study selection process (Page et al., 2021). [Colour figure can be viewed at wileyonlinelibrary.com]

TABLE 4 Characteristics of the studies selected in this review.

Author, year and country	Objective	Design	Sample and context	Intervention	Main results
Chen et al., 2021 Taiwan	To assess the effects of the programme on the learning, mental health and work intentions of newly graduated nurses	Quasi-experimental pre-post study with a single group	*N* = 293 NGRNs Mean age: not specified Setting: Large teaching hospital in Taiwan	Diversified adaptive education programme	Turnover: 12.6% over 3 months Retention: 87.9% over 1 year
Hu et al., 2015 Taiwan	To develop and evaluate the effects of a 10-min preceptor model to increase retention in hospitals	Quasi-experimental study with control and intervention group	*N* (C.G) = 54; *N* (I.G) = 53 NGRNs Mean age C.G = 23; I.G = 23 years Context: University hospital with two physically separate sites	Combined programme: residency programme + meeting points	Significant decrease in turnover rate I.G: 3.87 (SD = 2.5) – C.G: 5.06 (SD = 1.38); $t = -3.09$; $p = .03$ (0–10 points, ranging from none to highest leaving intention)
Koneri et al., 2021 USA Pre-pandemia	To reduce the turnover of new nurses completing a 1-year residency programme	Quasi-experimental study with a single group	*N* = 40 NGRNs Mean age: not specified Context: 2 sites of the same 717-bed hospital	Combined programme: residency programme + meeting points	Significant improvement in average retention rate Pre-intervention ($n_1 = 20$): $X^- = 11.5$ – Post-intervention ($n_2 = 20$): $X^- = 29.5$; MWU 380.000, 2-sided $p = .000$
Krofft & Stuart, 2021 USA	To describe the implementation of an evidence-based mentoring programme for nurses with less than 1 year of experience to reduce turnover rates	Quasi-experimental study with a single group	*N* = 12 NGRNs Mean age: not specified Context: eight medical-surgical units of a community hospital	Combined programme: residency programme + mentoring programme	Improvement in the level of intention to stay [Min.25–Max.130] Pre-intervention: $X^- = 67.33$ (range, 66–68) (SD = 1.15) Post-intervention $X^- = 88.33$ (range, 84–94) (SD = 5.13)
Author, year and country	**Objective**	**Design**	**Sample and setting**	**Intervention**	**Main results**
Pillai et al., 2018 USA	To evaluate the effectiveness of an institutionally developed GEMS nurse residency programme	Cohort study	*N* = 20 cohorts of 241 NGRNs Mean age: 23 years Setting: 305-bed hospital, Magnet accredited	GEMS nursing residency programme	One year after recruitment: Retention: 83%–88% GEMS Turnover: 10.5%–12% (0%–44.4%) Within 2 years of hire: Retention: 77%–85% GEMS Turnover: 31% (12.5%–50%) Loss of nurses 2nd year > 1st year (12%)
Shinners et al., 2021 USA	To evaluate the outcomes and quality of the Versant® Residency Programme for newly graduated nurses	Descriptive correlational study	*N* = > 6700 NGRNs Mean age: not specified Setting: not specified	Versant nursing residency programme	Turnover intention rate: 9% (1st year) – 21% (2nd year) – 40% (4th year)
Torres et al., 2021 USA	To describe the BFO programme to incorporate and address the rotation of newly graduated nurses	Quasi-experimental study with control and intervention group	*N* = 16 cohorts NGRNs Mean age: not specified Setting: 19 medical and medical-surgical inpatient units of a Magnet hospital	Combined BFO programme	Improvement of retention C.G: 96.1% – I.G: 97.2%

TABLE 4 (Continued)

Author, year and country	Objective	Design	Sample and setting	Intervention	Main results
Wolford et al., 2019 USA	To evaluate the effectiveness of a nursing residency programme in the rotation of newly graduated nurses	Quasi-experimental study with control and intervention group	*N* (C.G) = 791; *N* (I.G) = 232 NGRNs Setting: five hospitals	Residency programme	Significant reduction in turnover: C.G: 14%–I.G: 3.5% [X^2 (*N* = 68) = 19.55, $p < .001$]
Zhang et al., 2019 China	To evaluate the effectiveness of the Individual Mentoring Programme in reducing the turnover rate of newly graduated nurses	Quasi-experimental study with control and intervention group	*N* (C.G) = 199; *N* (I.G) = 239 NGRNs Mean age C.G = 23 and I.G = 23 years Setting: 70% were assigned to medical and surgical units	One-to-one mentoring programme	Improvement in the % of turnover: First year: C.G: 14.07%–I.G: 3.77% [$X^2 = 14.909$ $p < .001$] Second year: C.G: 3.48%–I.G: 9.36% [$X^2 = 6.023$; $p = 0.014$] Third year: C.G: 8.11%–I.G: 14.19% [$X^2 = 3.564$; $p = .059$]

Abbreviations: BFO, best fit orientation; C.G, control group; GEMS, Graduates Engaged Mastering Succeeding; I.G, intervention group; MWU, Mann–Whitney U test; *N* = sample; NGRNs, newly graduated registered nurses; USA, United States.

Wolford et al., 2019). Three residency programmes have been distinguished: GEMS (Graduates Engaged Mastering Succeeding) (Pillai et al., 2018), Versant (Shinners et al., 2021) and NRP (Nurse Residency programme) (Wolford et al., 2019). These three 1-year programmes, while sharing the common goal of providing NGRNs with the necessary elements assisting them in their transition to improve their competencies, job satisfaction, job engagement and retention (Pillai et al., 2018; Shinners et al., 2021; Wolford et al., 2019), do display some nuanced differences. Although all three programmes include a period of in-patient orientation with a preceptor, the duration varies. The GEMS programme is 2 weeks, the NPR programme is 8 weeks and the Versant programme depends on the needs of NGRNs. On the other hand, whereas all programmes have preceptor support in the clinical practice, only the Versant residency programme includes a supportive component consisting of formal mentoring and debriefing/self-care sessions. In terms of the competencies addressed, the GEMS programme includes a structured 14-week programme addressing both core and service-specific competencies; Versant is based on a system of more than 300 competencies classified as core, specific and cross-cutting, through an individualised learning plan, while the NRP does not specify competencies. Finally, the GEMS programme uses checklists to evaluate the new nurse, Versant's programme uses competency evaluation and debriefing/self-care sessions and NPR does not address this either.

3.3.2 | Individualised mentoring programmes

Another programme that facilitates the retention of NGRNs is one-on-one mentoring. This type of programme focuses on the one-to-one relationship that is established between mentor and mentee to guide the transition from student to nurse. It is important that this relationship is nurturing and long-lasting in order to enhance the professional and personal development of NGRNs. In addition, it is necessary for the mentor to train, encourage, guide and support the mentee so that the latter sees their mentor as a role model (Zhang et al., 2019). These types of programmes have been found to be implemented less frequently on a stand-alone basis (Zhang et al., 2019) but more frequently in combination with the residency programmes, as further described below.

3.3.3 | Combined programmes

Combined programmes combine residency and one-to-one mentoring into a single programme. These can be integrated simultaneously, as in three of the four studies (Hu et al., 2015; Krofft & Stuart, 2021; Torres et al., 2021), or sequentially (Koneri et al., 2021). Krofft and Stuart (2021) describe the implementation of an evidence-based mentoring programme for 12 NGRNs in medical-surgical units in a small hospital in the United States (US) during the COVID-19 pandemic. They suggest that it was key to combine transition training

TABLE 5 Interventions to promote nurses' retention.

		Competencies			Components					Results
							Support			Effect estimate
Study	Interventions	Co	S	C-C	Duration	Content	P	CD	M	Turnover rate[a] OR, 95% CI
Pillai et al., 2018	A.1	✗	✗		12 months	Inpatient orientation + structured programme	✗	✗		OR: 1.1, 95% CI: 0.6–2.0 n.s
Wolford et al., 2019	A.3	✗	✗		12 months	Inpatient orientation (8 weeks) with preceptor support + Programme	✗			OR: 0.2, 95% CI: 0.1–0.4 $p < .001$
Zhang et al., 2019	B	✗	✗		12 months	Inpatient orientation (3 weeks)			✗	OR: 0.2, 95% CI: 0.1–0.5 $p < .05$
										Retention rate[b] OR, 95% CI
Pillai et al., 2018	A.1	✗	✗		12 months	Inpatient orientation + structured programme	✗	✗		OR: 1.5, 95% CI: 0.9–2.5 n.s
Torres et al., 2021	C BFO	✗	✗		3 months	Structured training in 3 units.	✗	✗	✗	OR: 1.5, 95% CI: 0.1–19.9 n.s
Hu et al., 2015	C	✗	✗	✗	24 months	Inpatient orientation + academic training	✗		✗	Not applicable Survey turnover intention
Koneri et al., 2021	C	✗			6 months	Programme + 6 meeting points			✗	Not applicable Single group
Krofft & Stuart, 2021	C	✗			12 weeks	Inpatient orientation	✗	✗	✗	Not applicable Intention to stay survey
Shinners et al., 2021	A.2	✗	✗	✗	12 months	Individualised learning plan	✗		✗	Not applicable Turnover intention survey

Note: Interventions A: residency programmes (A.1: GEMS; A.2: Versant; A.3: NRP); B: individualised mentoring programmes; C: Combined programmes; D: diversified adaptive education programme; BFO: best fit orientation; GEMS: graduates engaged mastering succeeding; NRP: nurse residency program. Competencies CO: core; S: specific; C-C: cross-cutting; Support components P: preceptor; CD: coordinator; M: mentor.

[a]Percentage of employees who resign, retire, expire or are dismissed, divided by the number of employees during the same period.

[b]Percentage of new hires and departures in relation to the number of employees in a given time.

for these nurses with the development of supportive relationships early on to influence their intention to stay (Krofft & Stuart, 2021). Torres et al. (2021) present an alternative combined and simultaneous integrated programme in another US hospital called 'best fit orientation' (BFO). BFO is an innovative approach which is characterised by individualised orientation with the support of a mentor to develop clinical relationships, change management and selection of the 'best fit' medical-surgical units, and which has obtained good results in the short term (Torres et al., 2021).

Koneri et al. (2021) combined the 1-year residency programme followed by the 'Meeting Points' programme. During the 6 months of this programme, different meeting points are facilitated: (1) recognition of intrinsic value with personal letters; (2) development of loyalty through the internal publication of narratives about the residency programme; (3) respect and dignity through spaces to encourage transparent communication between nurses and management; (4) recognition; and (5) trust through interprofessional teams that support new nurses. This initiative has been found to be cost-effective in the medium to long term (Koneri et al., 2021).

3.3.4 | Diversified adaptive education Programme

Chen et al. (2021) describe a programme that provides instruction tailored to the skills, needs and interests of NGRNs, based on their learning styles. This programme addresses three parts: (1) learning care, in which teachers guide the nurse to understand and make good use of their own learning style for better performance; (2) care and monitoring of each new nurse's bio-psycho-social health by supervisors and peers; and (3) professional capacity enhancement by combining experiential and clinical learning.

3.4 | Competencies addressed in interventions

Interventions included in the nine studies to retain NGRNs have addressed the development of three competencies, in isolation or combination: core, cross-cutting and specific (Chen et al., 2021; Hu et al., 2015; Koneri et al., 2021; Krofft & Stuart, 2021; Pillai et al., 2018; Shinners et al., 2021; Torres et al., 2021; Wolford et al., 2019; Zhang et al., 2019). As seen in Table 5, all the studies have addressed the core competencies, five of them the first two, and two studies the three competencies. 'Core competencies' refer to the interpersonal and intrinsic skills and attitudes NGRNs must acquire to work in the hospital setting, including communication, teamwork, clinical leadership, critical thinking and conflict resolution (Koneri et al., 2021; Krofft & Stuart, 2021; Pillai et al., 2018; Torres et al., 2021; Zhang et al., 2019). 'Cross-cutting competencies' apply to more than one area of practice such as central venous catheter care or basic life support training (Hu et al., 2015; Shinners et al., 2021). 'Specific competencies' refer to the particular specialisation in which NGRNs practice, which would encompass the development of competencies for a specific clinical setting, training in specific nursing procedures and techniques such as chemotherapy administration (Chen et al., 2021; Hu et al., 2015; Pillai et al., 2018; Torres et al., 2021; Zhang et al., 2019).

3.5 | Components of the interventions

The main components that make up the interventions are described below in terms of programme development framework, duration, content and support components.

3.5.1 | Framework for programme development

Of the articles reviewed, half specify the theories underpinning the design of programmes to retain NGRNs (Hu et al., 2015; Koneri et al., 2021; Pillai et al., 2018; Shinners et al., 2021), while the other half are not explicit (Chen et al., 2021; Krofft & Stuart, 2021; Torres et al., 2021; Wolford et al., 2019; Zhang et al., 2019). Hu et al. (2015) combined the 1-minute preceptor model, which addresses achieving a commitment, piloting supporting evidence, teaching rules of thumb, reinforcing appropriate actions and correcting errors, with the five-step micro-skills model for clinical teaching. Koneri et al. (2021) build on Wind and Hays's touchpoint value creation model, which focuses on values to help achieve organisational goals, create an environment of trust that unifies the culture of the health care system, bridge silos of expertise and promote seamless integration. Similarly, Pillai et al. (2018) frame their programme in magnetic accreditation, which includes six elements: programme leadership, organisational enculturation, development and design, practice-based learning, nursing professional development and quality outcomes. Finally, Shinners et al. (2021) base their programme on Benner's conceptual framework from novice to expert, which argues that early on, nurses need training to develop and refine their skills. Once they have achieved specific clinical competencies, they need to develop further competencies.

3.5.2 | Duration of the programmes

The duration of programmes was quite variable, ranging from 3 (Chen et al., 2021; Torres et al., 2021) to 24 months (Hu et al., 2015), with those of 1 year being more frequent (Pillai et al., 2018; Shinners et al., 2021; Wolford et al., 2019; Zhang et al., 2019). It should be noted that although the results are not entirely conclusive, given the heterogeneity of the evaluation measures used, they suggest that longer programmes appear to have a more significant impact on nurse retention (see Tables 4 and 5).

3.5.3 | Content

The programmes described above include hospital orientation and training for NGRNs to acquire the necessary competencies.

Studies report that hospital orientation was provided with a variable duration between 5 days and 8 weeks (Hu et al., 2015; Krofft & Stuart, 2021; Pillai et al., 2018; Wolford et al., 2019; Zhang et al., 2019;) and constitutes the first step for the acquisition of cross-cutting competencies such as training on hospital operations, basic nursing procedures, safety and basic life support (Zhang et al., 2019). In isolation, Wolford et al. (2019) point out that this orientation should be done with the support of a preceptor. On the other hand, in terms of training, most programmes include clinical immersion with preceptor support for competency acquisition (Chen et al., 2021; Hu et al., 2015; Pillai et al., 2018; Shinners et al., 2021; Torres et al., 2021). Some authors combine clinical immersion with theoretical training, following a structured programme of 2-year classes (Hu et al., 2015) or a programme of 10 specialised classes (Pillai et al., 2018), while Shinners et al. (2021) combine it with case studies and focus group work.

3.5.4 | Support components

Three support components have been identified in the interventions reviewed: the preceptor, the mentor and the coordinator component, which are described below.

Preceptor component

Most of the studies reported interventions with a preceptor component ($n = 7$). 'Preceptor' is an experienced and competent nurse formally assigned to guide the professional journey of a NGRN joining a workplace, whose aim is to ensure NGRN become confident and competent enough to deliver quality care (Hu et al., 2015; Krofft & Stuart, 2021; Pillai et al., 2018; Shinners et al., 2021; Torres et al., 2021; Wolford et al., 2019). According to Chen et al. (2021), they must meet selection criteria as work full-time, have more than 3 years of experience in the hospital, receive at least 12 h of teacher training and have good interpersonal relationships. As stated by Shinners et al. (2021), it is important that they establish a good relationship with NGRNs, where both are involved in the care of all assigned patients. The length of this relationship varies across programmes: 8–12 weeks (Krofft & Stuart, 2021; Wolford et al., 2019), 14 weeks (Pillai et al., 2018) and 3 months (Chen et al., 2021; Torres et al., 2021).

In several studies, preceptors used a checklist to guide daily goal setting and identify strengths and areas for improvement in clinical practice (Pillai et al., 2018; Torres et al., 2021). Along these lines, Chen et al. (2021) note that the preceptor develops an individualised learning plan, guides new nurses to learn about the unit environment and the way they work, and provides feedback based on evaluations, reframing the objectives and training plan to meet individual learning needs in clinical practice.

Mentor component

Three studies reported that the interventions included a mentor component as part of mentoring programs, alone or in combination, to retain NGRNs (Krofft & Stuart, 2021; Torres et al., 2021; Zhang et al., 2019). Mentoring is a broad caring function that encompasses formal or informal support, guidance, coaching, training, teaching, role modelling, counselling, advocacy, networking and sharing. Mentoring, unlike preceptorship, also occurs outside the clinical setting and includes personal and professional guidance (Krofft & Stuart, 2021).

According to Zhang et al. (2019), the success of mentoring depends on the effectiveness of the mentor. In this regard, some programmes have set criteria for selecting a mentor, for example, a graduate degree, at least 3 years of work experience and a 4-h training programme on conflict resolution, critical thinking and communication. Likewise, to ensure the maximum match in interests and values between mentor-mentee and thus enhance their relationship, they try to match the mentor according to NGRNs' preferences and the unit supervisor's suggestions (Zhang et al., 2019). For these mentor-mentee encounters, several studies propose using a guide for development and evaluation (Krofft & Stuart, 2021).

Coordinator component

Three of the nine interventions had a coordinator component in residency (Pillai et al., 2018) and combined programmes (Krofft & Stuart, 2021; Torres et al., 2021). The coordinator, as its name suggests, coordinates the programmes and monitors the performance of NGRNs through meetings, the frequency and convening of which varies according to the specific programme. In the combined and residency programmes, these meetings are planned weekly or fortnightly at the beginning (Krofft & Stuart, 2021; Pillai et al., 2018) and spaced out quarterly from Week 14 onwards to motivate nurses to participate in the organisation's committees and ensure their professional advancement (Pillai et al., 2018). In terms of convening, the mentor is also involved in the combined programmes (Krofft & Stuart, 2021).

In addition, the coordinator is responsible for preparing the teaching guide and providing it to the NGRNs. They also assign a mentor who best matches the NGRN and the preceptor who carries out the practical follow-up (Krofft & Stuart, 2021).

3.6 | Effectiveness of programmes

Given the heterogeneity of the outcome measures used in the studies reviewed, it does not seem possible to determine which programme is more effective for the retention of NGRNs. Nevertheless, as shown in Table 5, an analysis of the extent of the effect of interventions measured with the same instrument for nurse turnover and retention has been conducted. The turnover rate is the percentage of employees who resign, retire, expire or are terminated, divided by the number of employees during the same period. The retention rate refers to the percentage of NGRNs and departures in relation to the number of nurses at a given time.

This analysis suggests that 1-year nurse residency and individualised mentoring programmes, addressing core and specific competencies and including preceptorship or mentorship, significantly decrease the likelihood of nurses' turnover rate, OR: 0.2, 95% CI: 0.1–0.4, $p < .001$ and OR: 0.2, 95% CI: 0.1–0.5 $p < .05$, respectively (Wolford

et al., 2019; Zhang et al., 2019). The results also seem to indicate that the likelihood of retention of nurses in the combined programmes, which address core and specific competencies, including preceptorship, coordinator and mentoring support, is higher, although not significantly, OR: 1.5, 95% CI: 0.1–19.9 (Torres et al., 2021).

Moreover, as shown in Table 4, significant improvements in turnover and retention rates were found in two studies that included a combined programme as an intervention. The quasi-experimental study, with a control and intervention group, by Hu et al. (2015), using a survey, obtained a significant improvement after programme completion in turnover rate ($t = -3.09$; $df = 1.19$; $p = .03$), as did the quasi-experimental study with a single group by Koneri et al. (2021) in mean retention rate (U = 380.000; $df = 18.00$; $p = .000$).

4 | DISCUSSION

This review reflected the diversity of interventions developed in the hospital context to promote the retention of NGRNs and clarify the competencies addressed, their components and effectiveness. Considering that the interventions are heterogeneous in terms of their typology, competencies to be addressed, content and measurement instruments, it is challenging to determine which ones are the most effective. However, the in-depth analysis of the results has enabled us to draw inferences, identify conceptual and methodological gaps and make some recommendations for future studies.

It is worth mentioning that the results of the studies suggest that nurse residency, individualised mentoring programmes and their combination appear to be effective to improve the turnover rate of NGRNs (Hu et al., 2015; Koneri et al., 2021; Wolford et al., 2019; Zhang et al., 2019). If the magnitude of the effect of the intervention measures with the same instrument is taken into account, the results suggest that isolated programs are the most effective to decrease turnover rate (Wolford et al., 2019; Zhang et al., 2019). However, these results are not entirely conclusive as they are limited to the analysis of the studies that have used the same measurement instrument. A significant improvement in the retention rate has also been found in other studies that have included combined programs in their intervention (Hu et al., 2015; Koneri et al., 2021), but it is not possible to know the magnitude of their effect on comparison with the other studies because they used a different measurement instrument or included a single group. The results of a quasi-experimental study with control and intervention groups and a sample of 37 NGRNs also seem to indicate that the likelihood of nurse retention in combined programmes is higher, although not significantly (Torres et al., 2021). This lack of significance may be due to the small sample size and the very short-term evaluation of the intervention. Thus, future similar studies could be carried out with a larger sample and evaluation in the medium-long term.

A relevant aspect of the effectiveness of these programmes is their sustainability. An interesting finding is that, even though the literature defends that the effectiveness of programmes supported by a conceptual framework is more sustainable over time (Macphee et al., 2012), the two interventions identified, based on a theoretical framework and measured in the long term, were not effective in a 2-year frame (Pillai et al., 2018; Shinners et al., 2021). The only study that demonstrated the sustainability of the effectiveness of its intervention does not specify whether it is based on a conceptual framework (Zhang et al., 2019). On the other hand, Wolford et al. (2019), through a multicentre quasi-experimental controlled study, recommended that reinforcement modules be incorporated into residency programmes from 1 year onwards to improve the engagement of NGRNs and ensure the sustainability of the intervention's effectiveness over time. However, in their study, they did not incorporate a reinforcement program or evaluate the long-term intervention, so it would be interesting to test this hypothesis in future studies. Another key aspect that could be taken into account in future studies to support the sustainability of the success of new programmes is to analyse their feasibility in the context in which they are implemented with the available resources, as suggested Suárez-Obando et al. (2018).

The interventions included in this review have addressed the development of three competencies, in isolation or in combination: core, cross-cutting and specific. Other intervention studies should address at least two of these competencies: core and specific, as they have been included in the most effective programmes in this review to decrease the likelihood of nurse turnover rate (Wolford et al., 2019; Zhang et al., 2019) and in interventions that achieved significant improvements using other instruments (Hu et al., 2015; Koneri et al., 2021). Only two studies addressed all three competencies, also incorporating the cross-cutting competency (Hu et al., 2015; Shinners et al., 2021), although neither study details their content or the format in which competencies are achieved. One of the studies does show a significant decrease in turnover rate, even if based on a small sample (Hu et al., 2015). Furthermore, there was no homogeneity in the programme content for the acquisition of competencies, and none included a tool for periodically assessing the compliance of these competencies, which would enable the development of an individualised training plan adapted to the learning pace of each nurse. In this sense, having programmes with similar content could facilitate their implementation, monitoring and evaluation. Importantly, these findings are the result of little research with some methodological limitations, such as the fact that some quasi-experimental studies were single-group ones or that multiple measurements were not taken before and after the intervention, thus making it difficult to ascertain whether there was a change after the intervention. For this reason, there may be competencies that have not been identified and others that need to be explored in greater depth, for example, decision-making as a core competency for conflict resolution (Zhang et al., 2019).

Having support components for programme development is another finding of great interest. In this regard, it is worth mentioning that only one study (Krofft & Stuart, 2021) includes all three-support components identified in the results: preceptor, mentor and coordinator. Among the studies that highlight the preceptor component (Chen et al., 2021; Krofft & Stuart, 2021; Pillai et al., 2018; Shinners et al., 2021; Wolford et al., 2019), none agrees on the duration of the

preceptor-NGRN relationship or shows consensus on how mentoring should be developed. All programmes do however coincide in that mentors should be selected according to criteria as professional experience, training and interpersonal skills (Hu et al., 2015; Krofft & Stuart, 2021; Torres et al., 2021; Zhang et al., 2019) despite differences in the duration of the relationship, which goes from 12 weeks (Krofft & Stuart, 2021) up to 1 year (Zhang et al., 2019). Finally, three studies included the coordinator component in their intervention (Krofft & Stuart, 2021; Pillai et al., 2018; Torres et al., 2021) but, though agreeing that they meet periodically with the NGRN, none defined this role.

All of the studies aimed to measure the effectiveness of the interventions, a task that is difficult due to the heterogeneity these present. Nevertheless, the analysis provided in our review of the extent of the effect of interventions measured with the same instrument for nurse turnover suggests that 1-year nurse residency and individualised mentoring programmes, addressing core and specific competencies and including preceptorship or mentorship, are effective to decrease the likelihood of nurses' turnover rate. These findings are of great interest considering the global nursing shortage (GBD, 2019, 2022) and the fact that nurses' intention to change jobs may begin as a process of disengagement. First, nurses leave their organisation; then, they leave the nursing profession altogether. If hospital managers can stop this first step, nurses may not leave their professional work (Jasiński & Derbis, 2022), and the global nurse shortage gap may be remedied. Therefore, managers should periodically investigate nurses' turnover intentions through indicators of turnover and retention rate, a self-report survey or by interviewing them. It is also noteworthy that only one study in this review included, in addition to retention outcomes, NGRNs' perceptions of their lived transition process in a hospital setting (Pillai et al., 2018). It is relevant to address this gap in the implementation of further interventions as the motivations and needs that nurses may have to stay in an organisation may vary depending on their age (Vázquez-Calatayud et al., 2021). As for the studies included in this review, most of them do not specify the mean age of nurses, but the few studies that do so apply to Generation X, with a turnover rate above what is considered optimal (Dewanto & Wardhani, 2018). The millennial generation, who were born a decade later, display high levels of psychological distress related to experiences in complex work environments such as hospital settings, which may function as a predictor for leaving the profession. Because of this, 60% of millennials are open to other job opportunities (McClain et al., 2021). If they stay in a job for 3 years, they are likely to remain loyal to the organisation. This problem, predicted by ICN in the report 'Sustain and Retain in 2022 and Beyond' (Buchan et al., 2022), has been exacerbated by the pandemic. It should be mentioned that, although COVID-19 is recognised to be associated with turnover, from this review it is difficult to make assertions in this regard, given that the results of the two studies conducted during the pandemic are obtained using different instruments (Krofft & Stuart, 2021; Shinners et al., 2021). The ICN report suggested that up to 13 million nurses might need to be replaced worldwide in the coming years. New data collected over the last 12 months highlights that these trends are continuing and increasing, indicating that the current state of nursing human resources should be considered a global health emergency (Buchan & Catton, 2023). Therefore, it is important to invest in feasible and effective programmes to retain NGRNs in these contexts.

4.1 | Limitations

This review has several limitations. First, although it was based on a comprehensive search strategy, the small number of included studies may limit the ability to identify the effective interventions that promote the retention of beginning nurses in the hospital setting and their components. Second, only the findings from previously published articles in English and Spanish were extracted and used in this review. It is therefore advisable for future studies to include all studies published in different languages. Third, most studies were conducted in the US, reflecting a gap in research and potentially omitting programmes offered in other countries, which limited the study results and inferences.

On the other hand, this study has several strengths, including the rigorous process implemented by the two researchers. The review was conducted according to PRISMA guidelines and prospectively registered Prospero (Table S1).

5 | CONCLUSIONS

This systematic review provides relevant information to support the design, implementation and evaluation of further NGRNs' retention interventions in the hospital setting. The small number of studies identified and their methodological limitations have influenced the extent to which conclusions could be drawn. Nevertheless, promising interventions appear to be either nurse residency or individualised mentoring programmes, lasting 1 year, addressing core and specific competencies and including preceptor or mentorship. Future research should focus on standardising the description of interventions and outcome measures used to evaluate these interventions with rigorous methodology.

6 | RELEVANCE TO CLINICAL PRACTICE

The knowledge provided by this review will contribute to developing and implementing more effective and context-specific strategies to retain NGRNs and consequently enhance patient satisfaction, reduce costs associated with recruitment and training, and create a more positive work environment for nurses, which will have a direct impact on patient outcomes, patient safety and quality of care. In particular, promising interventions to retain NGRNs in the hospital setting appear to be either nurse residency or individualised mentoring programmes, lasting 1 year, and multi-component, addressing core and specific competencies and including preceptor or mentor components.

This review will also serve as a starting point for future research aimed at filling the conceptual and methodological gaps identified. For example, there is a need to standardise the description of interventions and outcome measures used to evaluate these interventions and conduct further research with rigorous methodology.

AUTHOR CONTRIBUTIONS

MV-C and MCE-A made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; They involved in drafting the manuscript or revising it critically for important intellectual content; They given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; They agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any of the work are appropriately investigated and resolved.

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CONFLICT OF INTEREST STATEMENT

No conflicts of interest have been declared by the authors.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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