



Factors that influence continuing professional development over a nursing career: A scoping review

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ABSTRACT

Aims: Systematically synthesize research about factors that influence CPD over a nursing career.

Background: Continuing professional development (CPD) in nursing is defined as ‘a life-long process of active participation in learning activities that assist in developing and maintaining continuing competences, enhancing professional practice and supporting achievement of career goals’. Research has shown that inability to access resources and activities for CPD influences quality of care and adversely affects nurses’ satisfaction, recruitment and retention. Although more and more research regarding CPD is done, a comprehensive overview about the needs of nurses for successful CPD is missing.

Design: Scoping review, using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews ensuring all quality standards are met.

Methods: Between February and April 2020 the electronic databases CINAHL, PubMed, Scopus, Psycinfo and Eric were searched as well as reference lists of included papers. Papers published in peer-reviewed journals were included without restrictions on publication date, design or setting. Thematic analysis was done to synthesize the data.

Results: The search yielded 2673 papers of which 60 papers were included. Analyses showed that factors that influence CPD differ over a nursing career, which led to the identification of three groups: newly graduated nurses; experienced nurses; and experienced nurses with ambitions for advanced roles. Furthermore, analyses showed that factors for all three groups are related to personal and contextual facilitators and barriers. Newly graduated nurses find it important to be an accepted member of the team. They experience barriers when integrating into the nursing profession, where they for instance experience workplace incivility. Experienced nurses experience contextual barriers related to a lack of supportive structures and inaccessibility of CPD resources. There is limited time and availability of role models and a lack of support from managers and other colleagues. Moreover, the clinical care dynamics influence their ability to pursue CPD. For the experienced nurses with ambitions for advanced roles, an important barrier is that nursing culture emphasizes direct patient care. Often it is unclear what the value is of new nursing roles which makes it difficult for them to develop these.

Conclusions: All nurses strive for CPD. However, organizations need to recognize nurses’ personal goals and unique strategies as this leads to different needs in CPD. In addition, resources must be made available and accessible before CPD can be successfully pursued by all nurses.

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1. Introduction

Healthcare systems constantly change due to technological and scientific innovations and an increase in demands and needs of patients. This urges nurses to continuously develop their knowledge and skills in all nursing settings and diverse areas of development such as clinical, administration and research (Govranos and Newton, 2014; Vázquez-Calatayud et al., 2020). Continuing professional development (CPD) in nursing is defined as: “a life-long process of active participation by nurses in learning activities that assist in developing and maintaining their continuing competence, enhancing their professional practice and supporting achievement of their career goals” (Pool et al., 2015). Other synonyms of CPD in nursing are continuous nursing education and life-long learning (King et al., 2020). There are several reasons why CPD in nursing practice is a challenge.

First, the effects of educational activities on patient outcomes are not straightforward. Lack of follow-up evaluation means that there is little evidence that the knowledge and skills acquired in education are applied in practice or, wider, that educational activities of nurses improve patient outcomes (Griscti and Jacono, 2006). Some studies describe the positive impact of CPD on patients, professionals and organizations (Aiken et al., 2003; Carlisle et al., 2011; Gibbs, 2011; Hariyati and Safril, 2018; Levett-Jones, 2005). However, an extensive review about the effects of educational activities and workshops for healthcare professionals, showed that the effect on professional practice and patient outcomes was small (Forsetlund et al., 2009). Furthermore, most of these studies have methodological limitations. They often use (self-reported) questionnaires and interviews to determine the impact of CPD (Barba and Fay, 2009; Gijbels et al., 2010; Golaghaie et al., 2019; Marzlin, 2011).

Second, there is a growing awareness in literature that knowledge and skills acquired in training are not making their way into practice, also known as ‘the knowledge-to-action gap’. It requires a ‘transfer of knowledge’ where nurses are able to apply new acquired knowledge and skills into practice (Graham et al., 2006). Transfer is a complex concept which is influenced by several factors. The dynamic transfer model describes transfer as a dynamic process that unfolds over time (Blume et al., 2019). It includes three phases and personal (for instance motivation) and contextual (for instance support from supervisor and colleagues) influencing factors (Blume et al., 2019). The importance of contextual factors for transfer to occur is also described in other studies (Davidson et al., 2020; Graham et al., 2006; King et al., 2020). Workplaces differ in providing educational activities, in job autonomy and workplace culture (Drach-Zahavy et al., 2014; Govranos and Newton, 2014; Hart and Rotem, 1995) and the accessibility to knowledge and experiences is influenced by hierarchy and cultural practices (Pool, 2015). Research shows that motivation to pursue CPD activities may be different depending on the career trajectory of nurses (Pool, 2015).

Inability to access CPD influences quality of care and adversely affects job satisfaction, recruitment and retention (King et al., 2020). At this moment, a comprehensive overview of factors that influence CPD in nursing practice is missing. Therefore, this review included the following research questions: 1) what are the personal and contextual factors that influence CPD in diverse settings and areas of nursing practice? 2) do these factors differ over a nursing career?

2. Methods

2.1. Design

A scoping review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-scr) (Tricco et al., 2018). By using PRISMA-scr this scoping review used a systematic approach to identify factors that influence CPD in nursing practice and knowledge gaps in current literature. The scoping review consisted of the following steps:

1) formulating the research questions; 2) search for relevant studies; 3) selecting papers based on predefined in- and exclusion criteria; 4) data extraction; and 5) data synthesis.

2.2. Eligible criteria

Papers were included in this review if they focused on factors that influence CPD in nursing practice. The search was restricted to papers published in peer-reviewed journals, written in English. There were no restrictions on publication date, design or setting, because the researchers wanted to include a broad range and comprehensive overview of factors that influence CPD in nursing practice. Papers that discussed the development of learning interventions for nursing curricula or exclusively included nursing students, physician assistants and advanced practice nurses were excluded, as this review has a focus on nursing practice. Furthermore, the scope of this review did not include outcomes or effects of CPD as the diversity in published papers about this subject makes comparison of results difficult.

2.3. Information sources and search strings

Before a search was executed in electronic databases, three researchers (LH, KM-vN, JC-K) independently drafted a search strategy. These strategies were compared and when consensus was reached about the combinations of Medical Subject Headings (MeSH) and other relevant (open) search terms, expert advice was sought from two experienced library information specialists in two different hospitals. This resulted in a final search strategy for PubMed, which was transformed to fit other databases (CINAHL, Scopus, Psycinfo) with the aid of the Institute of Evidence Based Healthcare Systematic Review Accelerator (Clark et al., 2020). These search strings were also checked by the research team (KM-vN/LH) and an experienced library information specialist. For a comprehensive overview of the search terms and search strings used in the diverse databases see [Supplemental material](#), Table 5. For database ERIC the help of the experienced library information specialist was also sought. The main literature search was executed between February 2020 and April 2020. All papers ($n = 2673$) were exported to Endnote where duplicates were removed. Then, papers were exported to Rayyan (a web application to help systematically conduct a scoping review) (Ouzzani et al., 2016).

2.4. Selection of eligible papers

The in- and exclusion of papers consisted of three rounds (Fig. 1, Flow Diagram):

First, all papers in Rayyan ($n = 1292$) were independently screened for eligibility on basis of title and abstract by three researchers (LH, KM-vN, JC-K). In Rayyan, the reviewers could indicate if they wanted to include, exclude or maybe include each paper. At first blinks were on, so researchers were not influenced by each other’s decisions. When the researchers were finished screening, the blinks were off, and conflicts were resolved by discussion.

In the second round, all papers ($n = 100$) that were included in the first round were screened in full independently by all three researchers (LH, KN-vN, JC-K). The researchers again decided based on the in- and exclusion criteria which papers they wanted to in- or exclude. Again, conflicts were resolved by discussion. This resulted in the final inclusion of 49 papers.

In round three, all reference lists of the included papers ($n = 49$) were scanned to identify any papers that may have been missed in the initial database searches. This resulted in the inclusion of another 11 papers. Therefore, in total, 60 papers were included in the review.

2.5. Data charting process

The first draft of a data charting form was developed by the main

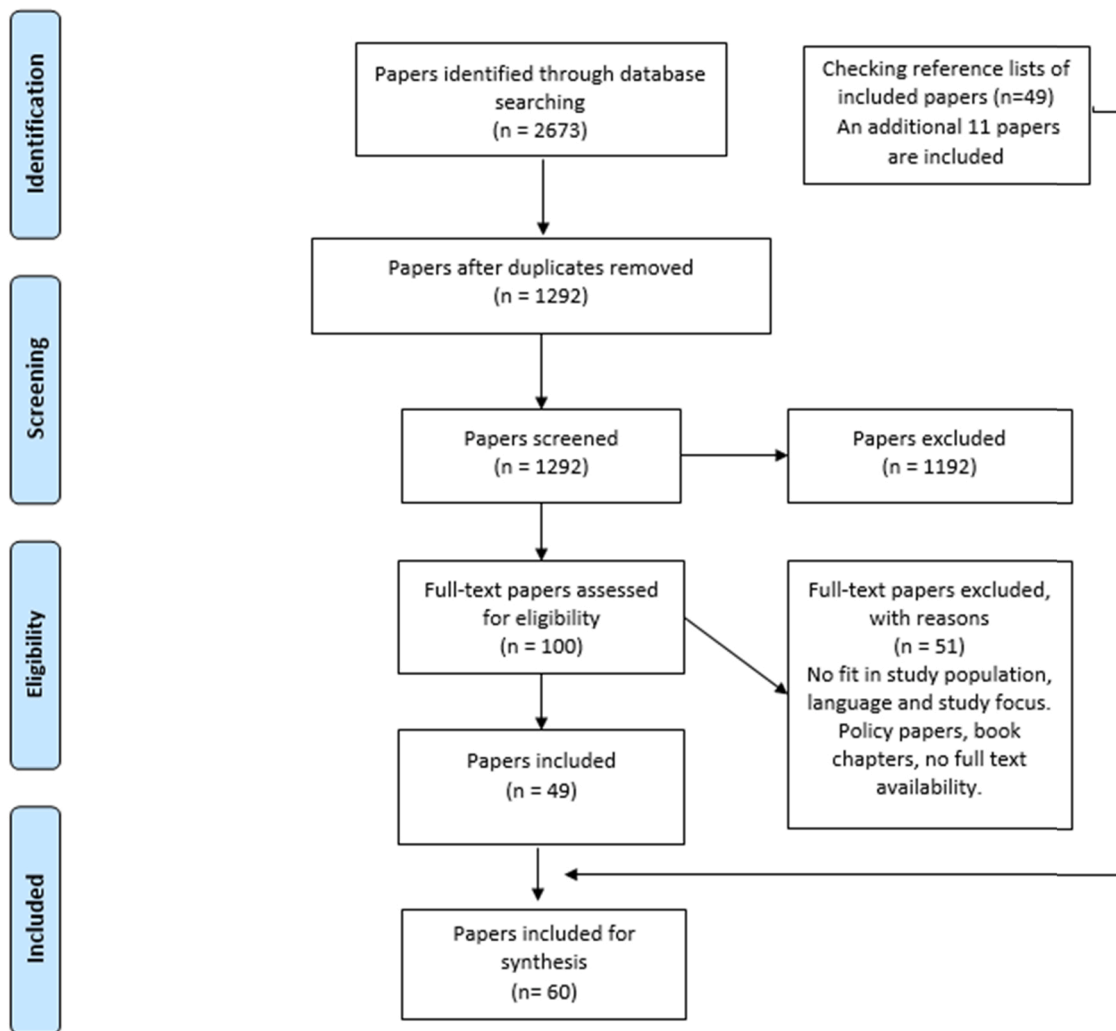


Fig. 1. Prisma Flowchart.

researcher (LH) and discussed within the research team. The charting form captures relevant information on key study characteristics, population characteristics and detailed information about factors that influence CPD in nursing practice. The main researcher (LH) electronically extracted data into the charting form, to reduce the chances of data-entry errors. The other members of the research team checked the form for accuracy. The results were then discussed within the research team where disagreements and inconsistencies were resolved.

Synthesis of results For the synthesis of the results thematic analyses were used according to the method of Braun and Clarke (Terry et al., 2017). It consists of six steps. First, the researchers (LH, KN-vN, JC-K) familiarized themselves with the data. They read all included papers in full and then they extracted data with the pre-defined extraction form, where all relevant data of the papers were included. In step two, initial codes were generated. This led, in step three, to the identification of four main themes: context facilitators; context barriers; personal facilitators; and personal barriers. The results of all papers were transferred to a new table and divided in the four themes. Further analysis of the data (step four) within the four themes showed differences in data referring to career trajectories of nurses and led to the identification of three groups (step five); newly graduated nurses, experienced nurses and experienced nurses with ambitions for advanced roles. Results are therefore described in contextual and personal facilitators and barriers for the three identified nursing groups (step six).

3. Results

3.1. Characteristics of included papers

Of the 60 papers included in this review 38 used a qualitative design, 14 used a quantitative design and 8 papers used a mixed method design. In 33 papers registered nurses were included and in 13 papers a mix of participants was used. For instance, a combination of nurses, academia, professional associations or staff in educational positions. Only one paper included exclusively managers and 13 papers included no participants as they were literature studies or opinion papers. Most of the papers were conducted in the USA, Canada and Australia ($n = 40$) and published after 2005 ($n = 52$). The papers focused on different nursing settings, for instance mixed settings (a combination of at least two different settings), hospital and educational settings. The areas of development were mostly broad in the included papers, focusing on continuing nursing education and professional development. Supplemental material Table 6 provides an overview of the characteristics of all included papers and Table 1 shows some summarizing characteristics of the included papers.

The thematic analyses of the included papers resulted in two main themes; 1) perceived factors influencing CPD are different for three nursing groups and 2) the perceived factors that influence CPD are related to personal and contextual facilitators and barriers. Within the first theme three nursing groups were identified: 1. Newly graduated

Table 1
Characteristics of included papers.

Characteristics	Number of papers
Year of publication	3
< 2000	5
2000–2005	18
2005–2010	10
2010–2015	24
2015–2020	
Country	19
USA	10
Canada	11
Australia	5
Iran	4
UK	11
Other	
Number of participants	26
< 100	13
100–500	4
> 1000	4
No participants	13
Type of participants	33
Registered nurses	1
Managers	13
Mixed*	13
No participants	
Method data collection	38
Qualitative	14
Quantitative	8
Mixed Method	
Location* *	
Mixed settings	26
Hospital setting	20
Educational setting	7
NA	5
Others	2

*Combination of practice, Academia, professional associations, government agencies, staff in education positions.

**Mixed settings: inclusion of minimal two different settings, Educational setting: training at an educational institution, NA (Not Applicable): in case of literature papers or opinion papers, others: 1 paper included solely a Public Mental Health facility and 1 paper included solely a tertiary referral center.

nurses, 2. Experienced nurses and 3. Experienced nurses with ambitions for advanced roles. The thematic analysis are sub-grouped by personal and contextual factors within each of the nursing groups. The results are also summarized in [Tables 2,3,4](#).

3.2. Newly graduated nurses

3.2.1. Personal

The professional identity of newly graduated nurses (NGNs) is influenced by knowing, affirmation and belonging (Jewell, 2013). They want to fit in, show their knowledge and be an accepted member of the team. However, their excitement is often replaced by uncertainty and self-doubt when they enter the workplace (Jewell, 2013). Feelings of

Table 2
Factors that influence CPD for Newly graduated nurses (NGNs).

Personal		Context	
Facilitators	Barriers	Facilitators	Barriers
- Clinical placement experience	- Uncertainty and self-doubt	- Help and support of managers and physicians	- Eating our young
- Academic background		- Openness in atmosphere to discuss discrepancies	- Orientation programs do not meet needs of NGNs
- Life experience		- Freedom to practice nursing	- Dynamics of care unit
- Pro-activity			- Lack of preceptors

Table 3
Factors that influence CPD for experienced nurses.

Personal		Context	
Facilitators	Barriers	Facilitators	Barriers
- Patient specific concerns	- Family obligations	- Support, demand and trigger learning	- Lack of leadership and support at all levels
- Change in workplace	- Stress	- Role models and experts	- Lack of access to resources needed for development
- Self-awareness of knowledge gap	- Work-life balance	- Access to programs and hospital based sources	- Do not feel supported
- Improving clinical practice	- Financial reasons	- Career trajectories	- Clinical Care dynamics
- Professional development	- Lack of support from employer and/or staff	- Relationships with university and industry	- Mismatch education and practice
- Enhance career/job satisfaction	- Unawareness of learning projects		
- Comply with requirements			

Table 4
Factors that influence CPD for experienced nurses with ambitions for advanced roles.

Personal		Context	
Facilitators	Barriers	Facilitators	Barriers
- To expand and develop new roles	- Financial reasons	- Support from work and family	- Emphasis direct patient care
- Job opportunities	- Lack of support from employer	- Facilitated career structures	- Unclear value of nursing researchers
- Personal goals	- Resistance to develop new higher roles		- Lack of guidance and support regulatory bodies
- Time and financial reasons			
- Amount of credits			

uncertainty can limit the integration into the professional team and their professional development. Positive personal factors mainly relate to characteristics of NGNs. Integration into the nursing profession helps when NGNs have an academic background, more life-experiences, are being pro-active and have more clinical placement experience (Charette et al., 2019).

3.3. Context

Most of the barriers of NGNs are related to the integration into the nursing profession (Charette et al., 2019; Jewell, 2013). A literature review about barriers NGNs experience at the beginning of their career describes the concept of ‘Eating our young’ (Jewell, 2013). NGNs experience unkindness, abuse and workplace incivility. It is important for them to feel they are an accepted member, but often their limited knowledge and skills is seen as a weakness (Jewell, 2013). Also, orientation programs developed for NGNs do not meet their needs, because they are too short in duration for competency development (Charette et al., 2019). The dynamics of a care unit also influence competency deployment, such as limited stability, a high workload and the absence of a scientific culture (Charette et al., 2019). Furthermore, not all experienced nurses want to be preceptors, which has a negative

influence on the integration of the NGNs (Charette et al., 2019).

Positive contextual factors for professional development of NGNs are related to the help and support of managers and physicians in decision-making, willingness to listen and their trust and respect towards each other (Numminen et al., 2015) and other positive factors such as openness of atmosphere in discussing discrepancies and freedom to practice nursing (Numminen et al., 2015).

3.4. Experienced nurses

3.4.1. Personal

Studies describe a large variety of personal barriers for nurses for their professional development, such as: family obligations, stress, work-life balance, financial reasons (costs or poor compensation) lack of support from employer and lack of relief staff (Caporiccio et al., 2019; Hegney et al., 2010; Khosravi et al., 2015; Ng et al., 2016; Parker et al., 2011; Watts et al., 2007). Nurses reported they were unaware of self-directed learning projects to earn educational credits (McCarten, 2000). And they feel they do not have enough authority to change care procedures (Henderson et al., 2005). Furthermore, educational activities are not tailored to their needs, which influences their motivation in a negative way (Khomeiran et al., 2006).

In general nurses report a reserving attitude toward the research process (Kress, 2018). They have a lack of confidence, interest, motivation and belief in nursing research (Henderson et al., 2005). Nurses are often not involved in research work or there is limited willingness to participate in research or receive education about Evidence Based Practice (Ang et al., 2015; Halcomb et al., 2009).

Positive factors are triggers for learning, such as; patient specific concerns, changes in the workplace, self-awareness of a learning gap, clinical experience and learning from paradigm cases (Daley, 2001; Fowler et al., 2015; Jantzen, 2012; Jantzen, 2019). Learning for nurses occurs by workplace learning, by puzzling and enquiring, questioning peers and accessing resources, by learning from experiences of themselves and others and they learn from mistakes, errors and misjudgment (Harrison, 1993; Jantzen, 2008; Jantzen, 2019). Nurses value their colleagues for facilitating and encouraging their professional development (Davis et al., 2016).

Studies also describe a variety of intrinsic and extrinsic motivational factors for nurses to pursue professional development. Positive motivational factors are mostly intrinsic, such as: improving clinical practice and patient care, professional improvement and development (increase knowledge, skills and confidence), enhance career and improve job satisfaction (Hallinan and Hegarty, 2016; Joyce and Cowman, 2007; Khomeiran et al., 2006; Kinsella et al., 2018; Muliira et al., 2012; Ng et al., 2016; Pool et al., 2016; Richards and Potgieter, 2010). Extrinsic motivational factors mainly relate to comply with requirements (Pool et al., 2016).

There were also nurses who were not interested in returning to school for further education (Altmann, 2012). Reasons for not returning to school were; feelings of being too old, won't earn more money, costs and that it is not needed to provide good care (Altmann, 2012). They also mentioned not being encouraged during their initial licensing program to continue education (Altmann, 2012).

3.5. Context

Leadership and support for professional development of nurses is lacking at all levels. For instance, supporting structures such as, no coherent staff development plans, absence of a career pathway, unclear job descriptions, lack of a standardized nursing education system and inadequate staffing levels (Beal and Riley, 2019; Caporiccio et al., 2019; Parker et al., 2011). Not only regarding the work environment, but also societal, cultural or political support is lacking (Kitson, 2001; Nasrabadi and Emami, 2006). There is need for understanding that there are generational differences and needs and that support for professional

growth is different at places on the career trajectory (Bowles et al., 2019).

There is also structural lack of access to resources nurses need for their professional development, such as access to literature, data, technology, materials, time to practice skills, attend educational activities or read research and funding or economic compensation (Abebe et al., 2018; Beal et al., 2008; Bowles et al., 2019; Broussard et al., 1996; Caporiccio et al., 2019; Fowler et al., 2015; Haag-Heitman, 2008; Henderson et al., 2005; Meyer et al., 2007; Muliira et al., 2012; Penz et al., 2007; Richards and Potgieter, 2010; Risling, 2017; Watts et al., 2007). Nurses do not feel supported in their professional development by colleagues, physicians, managers and employers (Caporiccio et al., 2019; Henderson et al., 2005; Richards and Potgieter, 2010).

Clinical care dynamics also influence CPD of nurses. Disruptions in workflow and contextual changes such as an aging workforce or patient population and increasing patient complexity are negative factors (Burritt and Steckel, 2009; Valdez, 2009).

Nurses also experience a mismatch between educational activities and practice. Educational activities often do not meet their needs and should be more linked to practical application and patient outcomes. There is need for education about leadership and interprofessional education (Bowles et al., 2019; Sommerfeldt, 2013). Nurses need to develop qualities such as being innovative, having influence and advocacy to influence their work environment and professional development in a positive way (Bowles et al., 2019).

The literature also describes facilitators for CPD in practice. The workplace needs to support, demand and trigger learning, to encourage competence development (Jantzen, 2019; Manojlovich, 2005; Tabari-Khomeiran et al., 2007). Learning should be ongoing and integrated in daily practice (Beal et al., 2008). This includes a highly functional workplace team, a positive ward climate without fear of failure of punishment (Haag-Heitman, 2008; Jantzen, 2019; Khomeiran et al., 2006). With camaraderie, networking with peers and support and mentoring from colleagues (Burritt and Steckel, 2009; Fowler et al., 2015; Hallinan and Hegarty, 2016; Hopia et al., 2017; Jantzen, 2019; Leighton-Beck, 1997). For professional development, learning from and time with role models and experts is important (Adib-Hajbaghery, 2007; Burritt and Steckel, 2009; Jantzen, 2019; Meyer et al., 2007). Nurses need to have access to innovative educational programs, tools and hospital based sources (McSherry et al., 2012). Moreover, there needs to be availability of career trajectories, time, financial and staffing support and the necessary legislation to support development (Beal and Riley, 2019; Davis et al., 2016; Fairley, 2003; Meyer et al., 2007). Educational activities need to be based on the needs of nurses and focus on learning on the job (Fowler et al., 2015). Courses need to include interactive teaching and learning strategies, because course content, duration and quality influences transfer of learning, as do student-teacher and student-student relationships (Atack, 2002). Studies also describe that strong, collaborative relationships with universities and industries have a positive influence on professional development (Happell and McAllister, 2014; McSherry et al., 2012).

3.6. Experienced nurses with ambitions for advanced roles

3.6.1. Personal

Nurses with ambitions for advanced roles experience several personal barriers. Some barriers are the same for nurses who are at another place in their career trajectory, such as; time, poor financial compensation and lack of support from their employer (Broussard et al., 1996; Fairley, 2003; Fang and Bednash, 2017; Miller et al., 2016; Sarver et al., 2015). Nurses value their colleagues, doctors and educators in their further professional development (Fairley, 2003). Motivational factors for further professional development are; to expand and develop new roles, increase job opportunities, fulfill professional goals and interest in impact of nursing research on patient care (Fairley, 2003; Milner et al., 2005; Robb and Hunker, 2018; Sarver et al., 2015). Factors on which

nurses consider to pursue education are: time, financial reasons, fit and length of educational program and amount of credits that can be earned (Dreifuerst et al., 2016; Osterman et al., 2009; Sarver et al., 2015).

3.7. Context

The current nursing culture emphasizes direct patient care, this inhibits further professional development of nurses for instance in clinical academic careers (van Oostveen et al., 2017). Perspectives about the added value of nursing researchers is often unclear for employers, which might lead to lack of support and leadership at all levels (van Oostveen et al., 2017). Managers are often confused regarding the accountability of new higher roles and there is resistance and resentment to develop new roles by nursing colleagues (Fairley, 2003). Moreover, there is a negative perception of academia (Fang and Bednash, 2017). There is also lack of guidance or support from regulatory bodies, which can slow the process of developing new roles in practice (Fairley, 2003). This group of nurses also report a mismatch between educational activities and their work practice for further professional development (Dreifuerst et al., 2016).

For further professional development the support of the employer, colleagues and family remains important (Fairley, 2003; Osterman et al., 2009). Employers who facilitate career structures have a positive influence on further professional development (Osterman et al., 2009).

4. Discussion

This study showed that the perceived factors that influence CPD are related to personal and contextual facilitators and barriers. Furthermore, the factors that influence CPD differ over a nursing career. The important findings and discussions are described per nursing group.

When NGNs enter the workplace they often experience anxiety, stress, insecurity and feelings of incompetence (Hampton et al., 2020). This reduces confidence in their professional capabilities, also known as self-efficacy (Kim and Shin, 2020). As this review showed, intervention programs often do not meet the needs of NGNs. Therefore, it is important to develop intervention programs that include the needs of NGNs, but also include educational activities relating to structural empowerment to increase self-efficacy. Structural empowerment is the extent to which employees experience to have access to; information, support, resources and opportunity in their organization (Kim and Shin, 2020). It includes positive reinforcement and feedback, shared decision making with other colleagues and supportive relationships with senior nurses (Kim and Shin, 2020). Research shows that the better NGNs are engaged with empowering, the better they adapted (Kim and Shin, 2020). This influences job satisfaction and turnover rates. Furthermore, intervention programs should be a co-creation between academia and employers (Hampton et al., 2020). Because it is important to bridge the gap between undergraduate educational curricula and the highly dynamic and stressful nursing practice.

The second group in this review, the experienced nurses, is a diverse group. It includes older and younger nurses, with generational differences and needs. Nurses of younger age pursue CPD to build a career, older nurses often pursue CPD in relation to their patient care (Pool et al., 2016; Vázquez-Calatayud et al., 2020). The experienced nurses in this review also describe positive factors for learning often in relation to patient care, such as patient specific concerns, clinical experience and changes in the workplace. Learning occurs for them mostly at the workplace. Often educational activities do not meet the needs of nurses (Hakvoort et al., 2021). Therefore, it is important to create highly functional workplace teams, with a positive ward climate without fear of failure or punishment. Workplaces that promote knowledge creation and transformation of practice are key to effective CPD (King et al., 2020). Furthermore, the inability to access CPD influences quality of care and adversely affects job satisfaction, recruitment and retention (King et al., 2020). Nurses themselves also have a role in the creation of highly

functional workplaces. Therefore, it is important for them to develop skills in translating knowledge into practice and strong nursing leadership to influence their CPD (Davidson et al., 2006; King et al., 2020; Vázquez-Calatayud et al., 2020).

For the nurses who pursue further development in new roles, barriers mostly relate to the fact that nursing practice emphasizes direct patient care. Although nurses are the largest workforce, the integration of clinical and academic career pathways have been limited defined for nurses. This results in nurses not knowing where to begin when they are interested in pursuing academic careers (Avery et al., 2021). The importance of developing supportive infrastructures, promoting change in current nursing culture and the development of leadership qualities have been described (van Oostveen et al., 2017). It is important to position nurse academics in clinical practice. They promote the translation of knowledge into practice and the use of evidence based practice, which influences quality of nursing care (van Oostveen et al., 2017). Furthermore, nurse academics should have influence at the strategic and tactical levels in organizations, for instance by hiring a Chief Nursing Officer. It is also important for managers to realize they have an important role in the facilitation of nurse academics. For them to better understand what is needed, they should be involved in the research projects. At last, supportive infrastructures are needed for combining clinical and academic work, such as job descriptions and salary scales (van Oostveen et al., 2017).

The results of this review show that nurses, depending on their career trajectory, can experience different personal and contextual facilitators and barriers for CPD. In real life context these nurses work together. This has important implications for managers, policy makers and educational experts, but also for nurses themselves as they can struggle with creating positive learning environments where there is room for individual CPD needs of nurses. Some key components of positive learning environments have been described (Henderson et al., 2011). It requires effective management, positive partnership and inspirational leadership. However, concrete recommendations are lacking how positive learning environments can include all different CPD needs of nurses. Future research should focus on this theme.

There are some limitations regarding this study that need discussion. The search strategy was wide and did not include limitations for setting, area of development, publication date and methodology. This means that the results include factors that influence CPD in different settings over a longer period. By analyzing the data, we found that, at a general level, the factors for nurses in different settings are comparable. However, careful interpretation of our findings is necessary because of the inclusion of diverse settings and areas of development. The analysis of the data led to the identification of three nursing groups. By including 60 papers, a broadly based and rich comprehensive overview of factors that influence CPD in nursing practice was reached. Follow-up research could focus on factors that influence CPD within each group or on specific settings and areas of development.

5. Conclusion

This review showed a comprehensive overview of factors that influence CPD over a nursing career. Nurses have different needs in their CPD depending on the phase in their career trajectory. All nurses pursue CPD, but they have different goals, use different strategies and therefore have different needs in their CPD. The current nursing practice does not meet the needs of nurses. There is structural lack of access and availability of resources needed for CPD. It is important for nurses to develop skills in translating new knowledge into practice and strong nursing leadership to influence their CPD in a positive way. Strong nurse leaders are necessary as change agents and role models. However, excellent nursing practice is a shared responsibility of nurses, employers and educational institutions. A strong collaborative relationship between these stakeholders is necessary to create excellent nursing practice.

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CRediT authorship contribution statement

Lysette Hakvoort: Conceptualization, Design, Methodology, Formal analysis, Visualization, Writing – original draft. **Jeroen Dikken:** Conceptualization, Validation, Supervision. **Jessica Cramer-Kruit:** Validation, Formal analysis, Visualization. **Kristen Molendijk-van Nieuwenhuizen:** Validation, Formal analysis. **Marieke van der Schaaf:** Writing – review & editing, Supervision. **Marieke Schuurmans:** Writing – review & editing, Supervision. All authors read and approved the final manuscript.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

Availability of data and materials. The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.nepr.2022.103481](https://doi.org/10.1016/j.nepr.2022.103481).

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