Paediatric nursing clinical competences in primary healthcare: A systematic review

Cristina Laserna Jiménez[1] | Mireia López Poyato[1,2] | Isabel Casado Montañés[3] | Eva Maria Guix Comellas[1] | Núria Fabrellas[1]

[1]
School of Nursing, Faculty of Medicine and Health Sciences, University of Barcelona, Barcelona, Spain

[2]
Health Centre Les Corts, Consorci d'Atenció Primària de Salut de Barcelona Esquerra de l'Eixample (CAPSBE), Barcelona, Spain

[3]
Consortium of Castelldefels Health Agents (CASAP), Barcelona, Spain

Correspondence
Cristina Laserna Jiménez, School of Nursing, Faculty of Medicine and Health Sciences. University of Barcelona, Campus Clínic August Pi i Sunyer, c/Casanova, 143, 08036 Barcelona, Spain.
Email: claserna@ub.edu

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Abstract

Aims. To identify and critically appraise the available evidence on paediatric nurses' clinical competencies performed autonomously regarding disease prevention and health promotion activities for children and adolescents in primary health care worldwide.

Design. A systematic review design in accordance with the PRISMA statement.

Data sources. The search was conducted through MEDLINE (PubMed), CINAHL, SCOPUS, The Cochrane Library, Scientific Electronic Library Online (SciELO), Web of Science, and The Joanna Briggs Institute EBP (Ovid) databases. The grey literature was reviewed at OpenGrey. Additional studies were located through a references list of selected studies identified on first search.

Review methods. Database search employed MeSH terms: (paediatric nursing) AND (primary health care) AND ((clinical skills) OR (clinical competences)). Studies published from inception to October 2019 exploring paediatric nurses' clinical competencies in primary health care were eligible for inclusion. No language restrictions were applied in the main search. Selection was made by two reviewers independently. Three independent reviewers assessed the methodological quality of included studies.

Results. 18 studies were included from six countries. The most common nursing competencies independently performed identified and described in studies were Health education and advice, Child and adolescent health and development assessment, Immunizations, and Child health checks.

Conclusion. Studies describe clinical competencies of nurses in children care. No consistent scientific evidence is available about clinical competencies of paediatric nurses performed autonomously in primary care.

Impact. Few scientific studies identifying and assessing nurses' child primary health care skills were found and therefore recorded. Studies describe nurses' clinical skills in childhood, but results do not show firm consistency assessing their practice scope. Health policy-makers should encourage the development of nurses' competencies if they wish to preserve quality and equity

of health care services to children. Therefore, the first step is to identify the autonomous competencies of paediatric nurses in primary care.

Keywords: clinical competences, clinical skills, paediatric nursing, primary health care, systematic review

1 INTRODUCTION

A landmark document, the Alma-Ata Declaration in September 1978, established health as a fundamental human right and prioritized primary health care for all people in the world. The Alma – Ata Declaration Equality and health care access for everyone had to be ensured. Despite countries share the same goal: health as a fundamental right and equity in access to quality health care as a core target, government policies framing health systems and health care services provision vary among countries. Health care access, funding, services provision, and health care providers in high-income countries differ among them and even between provinces or states in the same country. Health care models and health care prioritization vary according to population needs and are influenced by political, social, demographic, cultural and historical determinants (Katz, Rubino, Collier, Rosen, & H Ehrich, 2002; Van Esso et al., 2010).

In October 2018, the World Health Organization (WHO) member states formulated a new document: The Astana Declaration for Primary Health Care, with the focus on universal health coverage and according to which everyone should have access to quality health services (World Health Organization, 2018). Primary health care should provide and promote preventive, curative, rehabilitative services and treatment for main health conditions (World Health Organization, 1978). Primary care focuses on individuals through all life stages from birth to death. “Evidence reveals that health systems based on primary care services that are first-contact, continuous, comprehensive, coordinated and people centred have better health

outcomes" (World Health Organization and the United Nations Children's Fund (UNICEF), 2018). Hence, high-income countries focus on primary care as the cornerstone of healthcare systems.

Population health at children and adolescent stages and their access to health care services are a priority according to article 24 of the Convention on the Right of the Child. To maintain optimal health levels for child population is a core health policy directive that requires to enhance the development of health professionals' competencies through all care levels and especially at primary health care, where disease prevention and health promotion are essential. However, there is an increasing shortage of physicians and paediatric specialists in health care services at first level of care (Buerhaus, 2018; Poghosyan, Liu, & Norful, 2017; Van Esso et al., 2010). It is therefore necessary to find alternative ways to ensure high quality health care services for disease prevention and health promotion at this life stage.

1.1 Background

Primary health care and primary health care professionals have a key role in disease prevention and health promotion activities (World Health Organization and the United Nations Children's Fund (UNICEF), 2018). Nurses are the health care professionals with the skills and capacities on disease prevention and health promotion inherent to their corpus of knowledge. Nurses are present in all levels of care. It is in primary care where they should lead preventative and health promotion activities both in adult and children stages. With proper training they can fully develop their competencies. Paediatric nurses focus on children and adolescents' physical growth and development. They need to have the competences to provide autonomous nursing care on health promotion, disease prevention, care to the healthy or ill new-borns, children or adolescents, and their rehabilitation (Pedraza Anguera, 2011).

In high-income countries like Canada, the United States of America, the United Kingdom, Australia, and New Zealand, nurse practitioners' education, academic title, and regulation were developed to improve access to care in response to the shortage of medical professionals (Grant,

Lines, Darbyshire, & Parry, 2017). Nurse practitioners have advanced practice roles, and they can work autonomously or collaboratively in primary health care for the adult and child population. They provide health education and promotion, preventive care services, acute and chronic illness management, order and interpret diagnostic test, referrals, prescribe medication and treatment plans (Hansen-Turton, Ware, Bond, Doria, & Cunningham, 2013). However, in some high-income countries of the European Union, paediatric primary care nurses do not require an advance practice training and health care to children is provided by different health care professionals depending on the country. Nurses are part of primary healthcare teams, and prevention activities and health checks can be performed either by nurses, paediatricians or general practitioners (Van Esso et al., 2010). In Europe, task shifting from physicians to nurses in relation to activities usually performed by physicians like drug prescription, diagnosis, treatment authority, referrals, medical test ordering, responsibility for a panel of patients and first point of contact, is a strategy aimed to improve access to health care (Maier & Aiken, 2016). There is variability among countries in Europe in relation to task shifting from physicians to nurses. Nurses' activities will either be extended, limited or task shifting will not even be officially authorized depending on the country they work (Maier & Aiken, 2016).

These strategies aimed to preserve health care services to the paediatric population while maintaining high quality of care require the optimization of nurses' roles as suggested by Galao, "enhancing nurses' competencies is an effective strategy that improves health care services" (Galao Malo, 2009). Therefore, reorganising tasks through agreed action plans, while enhancing nurses' roles and competencies helps to improve the quality of health care services. According to Bruguera et al. (2007), "a better task distribution among health care providers, especially in primary care, might achieve the highest care efficiency and provide better health care services". Enhancing nurses' autonomy and competencies might be an alternative to address the need for paediatricians and other physicians specialised in the treatment of children and preserve quality and equity of health care.

There is not much evidence on the autonomous competencies performed by nurses from those carried out by paediatricians or general practitioners in primary healthcare for children. Therefore, this was the subject of the present systematic review and our research question was “what are the clinical competencies paediatric nurses perform autonomously in primary care in relation to disease prevention and health promotion to children and adolescents worldwide?”. This review uses the terms “competences” and “competencies”. It is important to clarify the meaning of the two terms. The term “competences” is used to refer to the capability to carry out some nursing skills effectively, whereas “competencies” refers to the specific knowledges, skills or experience required to effectively carry out the professional role.

2 THE REVIEW

2.1 Aims

This systematic review of existing literature worldwide aims to identify and critically appraise the available evidence on the autonomous competencies of paediatric nurses in disease prevention and health promotion for children and adolescents in primary care.

2.2 Design

A systematic review of the literature according to the Preferred Reporting Items Systematic Reviews and Meta-Analyses (PRISMA) guideline (Liberati et al., 2009) was performed. The review protocol is registered and available in the International Prospective Register of Systematic Reviews (PROSPERO) with registration number CRD42020166310. The review considered all types of research designs from original studies. Quantitative observational (cross-sectional, retrospective observational, descriptive correlational) studies, qualitative (descriptive and interpretative) studies, and mixed design studies were included.

2.3 Search methods

2.3.1 Search strategy

First, an initial search was performed at MEDLINE database to identify key words before initiating the literature search. Secondly, once MeSH terms were identified, the literature search was performed across main international databases. MEDLINE (via PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL) (via EBSCO), SCOPUS, The Cochrane Library, Scientific Electronic Library Online (SciELO), Web of Science (WoS) and The Joanna Briggs Institute EBP (via Ovid) databases were used to search the literature. The grey literature was reviewed at OpenGrey. The inclusion period selected the studies published from inception to October 2019. No original language limitations were applied at the first search. Additional studies were located through a references list of selected studies identified by the initial search. The search strategy employed included MeSH terms (MEDLINE): (paediatric nursing) AND (primary health care) AND ((clinical skills) OR (clinical competences)). As for the rest of databases the same search strategy including MeSH terms was employed except for the Joanna Briggs Institute EBP (via Ovid) database where a basic search through the question "What clinical skills or clinical competences have paediatric nurses in primary health care?" was performed.

2.3.2 Inclusion /exclusion criteria

The studies included were in accordance with the research question and the following criteria. According to the PICO statement our research question is: what are the competencies paediatric nurses perform autonomously in primary care in relation to disease prevention and health promotion to children and adolescents worldwide? P: Target participants were nurses of any age or sex, providing primary child and adolescent health care services (from birth to adolescent age). I: Studies exploring paediatric nurses' clinical competencies and skills regarding disease prevention and health promotion in primary child health care. C: Nurses' clinical competencies not related to disease prevention and health promotion. O: Nursing competencies performed

autonomously. This review considered studies exploring clinical competencies of paediatric nurses in primary health care settings in relation to disease prevention and health promotion in children. Studies assessing the competencies of nursing students during the training period in primary care as well as those assessing competencies in University educational programmes were not included. No language limitation was applied at the first search.

2.3.3 Screening

Records of different consolidated databases were included. Duplicated studies were removed. All titles and abstracts were screened for inclusion by two reviewers independently (CLJ and NF). Full text of potentially relevant articles was read by both reviewers identifying the final studies included in the review. Discrepancies were resolved by a third reviewer (MLP). Reviewers were not blind to any study data. Two full text articles not available in English or Spanish were removed. In addition, the reference list of potential included studies was checked to identify more relevant studies. Mendeley software was used to manage the references of the included articles.

2.4 Search outcome

In our study selection process (PRISMA flow diagram, Figure 1), a total of 587 studies were identified by the search literature. After the removal of duplicate studies, 456 study titles and abstracts were assessed. A total of 322 studies were excluded, two of them because full text was not available in English or Spanish. The remaining 34 full text articles were assessed for eligibility. The autonomous competencies of paediatric primary care nurses in disease prevention and health promotion for children and adolescents, either individually or as part of a group of child health care providers, or in comparison to other child health care providers were identified and assessed. Finally, sixteen articles were excluded, seven of which dealt with curative services and different health care levels where the competencies of paediatric nurses could not be identified,

three articles described health training programmes that are used as a framework for nursing competencies, and three other studies identifying and assessing University programmes on the competencies of paediatric nurses were also excluded. One article described a practice guidance, another referred to all nurse practitioners, and one other article assessed different paediatric health care providers but failed to identify nursing competencies. A total of 18 studies were identified and included for qualitative synthesis.

2.5 Data extraction

Data were extracted from reports in duplicates by a peer reviewer (CLJ and NF). Discrepancies were resolved by discussion involving all review authors. Data were organized into literature tables. A summary of outcomes measure and the main results found in included articles are shown in Table 1. Main data included authors, year of publication, country, and study design; study population such as sample size, source, age: mean (SD) or median (range); research methods; outcomes measure; and key findings/ results.

2.6 Quality appraisal

Three authors (CLJ, MLP and EGC) assessed independently the methodological quality of included studies using appropriate appraisal checklists according to the study's design. All studies were assessed by the standardised QualSyst evaluation tool (Kmet, Lee, & Cook, 2004). QualSyst allows the assessment of methodological quality of quantitative and qualitative studies. QualSyst evaluation tool provides two separated scoring systems, one assessing the quality of studies employing quantitative methods (14 items scored 0-2; maximum score of 28) and another assessing the quality of studies employing qualitative methods (10 items scored 0-2; maximum score of 20). Some items may not be applicable in quantitative studies and are marked as "n/a". The sum of the total of item scores divided by the total possible scores reports a percentage from 0 to 100%, where 100% indicates the best methodological quality. Mixed-

method studies had each part appraised separately. Discrepancies were resolved by consensus or by the judgement of a fourth reviewer (NF). No studies were excluded by methodological quality.

2.7 Synthesis

Sample size, participants' selection, methodology design and nurses' competencies identified differed between studies. Meta-analysis was not possible due to the heterogeneity of outcomes data in quantitative research. The main themes identified were synthesized and recorded.

3 RESULTS

3.1 Study Characteristics

This review included ten cross-sectional studies (Berlin, Johansson, & Törnkvist, 2006; Ceccucci, 2018; Dumas et al., 2013; Freed, Dunham, Lamarand, Loveland-Cherry, & Martyn, 2010; Irwig et al., 1985; Larsen, Mandleco, Williams, & Tiedeman, 2006; Soriano et al., 2016; Vlam, 2006; Walsh & Mitchell, 2013; Walsh, Barnes, & Mitchell, 2015), one retrospective observational study (Aruda, Griffin, Schartz, & Geist, 2016), one descriptive correlational study (Kinder, 2016), four exclusively qualitative studies (Berlin, Hylander, & Törnkvist, 2008; Horwood, Voce, Vermaak, Rollins, & Qazi, 2010; Isma, Bramhagen, Ahlstrom, Östman, & Dykes, 2012; Isma, Bramhagen, Ahlstrom, Östman, & Dykes, 2013), and two mixed method studies (Lee & Wang, 2016; Vellema et al., 2008). One of the mixed method studies in quantitative phase was a quasi- experimental study (Lee & Wang, 2016), whereas the other was a cross- sectional study (Vellema et al., 2008). In qualitative phase of mixed studies, one performed focus group interviews (Lee & Wang, 2016), and the other had a descriptive design (Vellema et al., 2008).

Seven studies were carried out in the USA (Aruda et al., 2016; Ceccucci, 2018; Dumas et al., 2013; Freed, et al., 2010; Kinder, 2016; Larsen et al., 2006; Vlam, 2006), five in Europe (Berlin

et al., 2006, 2008; Isma et al., 2012, 2013; Soriano et al., 2016), three in South Africa (Horwood et al. , 2010; Irwig et al., 1985; Vellema et al., 2008), two in Australia (Walsh & Mitchell, 2013; Walsh et al., 2015), and one in China (Lee & Wang, 2016).

3.2 Risk of Bias within Studies

3.2.1 Quantitative studies

There was a lack of random sample. It was a convenience sample in many studies (Dumas et al., 2013; Irwig et al., 1985; Kinder, 2016; Larsen et al., 2006; Vlam, 2006; Walsh et al., 2015). Sample size was not appropriate in five studies (Aruda et al., 2016; Dumas et al., 2013; Vlam, 2006; Walsh & Mitchell, 2013; Walsh et al., 2015). One study registered an important loss of participant's data during the filling when the survey was stopped (Ceccucci, 2018). Three studies used a non-validated questionnaire tool (Berlin et al., 2006; Ceccucci, 2018; Larsen et al., 2006). A low response rate to the surveys was reported in three studies (Aruda et al., 2016; Berlin et al., 2006; Ceccucci, 2018). Outcomes and means of assessment were reported partially in four studies (Aruda et al., 2016; Irwig et al., 1985; Walsh & Mitchell, 2013; Walsh et al., 2015). Analytic methods were not appropriately described in one study (Aruda et al., 2016), or partially described (Irwig et al., 1985; Walsh et al., 2015). One study estimate of variance was not reported for the main results (Walsh et al., 2015). Three studies reported partial control for confounding (Freed et al., 2010; Vlam, 2006; Walsh et al., 2015), and one study (Aruda et al., 2016) was not controlled for confounding.

3.2.2 Qualitative studies

In two articles from the same author (Isma et al., 2012, 2013) participants were selected strategically as in the other two qualitative studies (Berlin et al., 2008; Horwood et al., 2010).

3.2.3 Mixed- method studies

In the two mixed method studies data analysis was described partially in the qualitative phase (Lee & Wang, 2016; Vellema et al., 2008). In one study (Vellema et al., 2008) outcomes and means of assessment were reported partially in quantitative phase and analytic methods were partially described and justified too. In this study the estimate of variance was not reported for the main results.

3.2.4 All studies

No study included was a clinical trial and none was blinded for participants or outcomes assessment by the nature of studies. Only one study (quasi-experimental design) (Lee & Wang, 2016) included in the systematic review performed a non-randomized intervention, and the random allocation was not possible. Quality assessment score (Kmet et al., 2004) range of quantitative methodology was from 68.18% to 100%. Quality assessment score range of qualitative methodology was from 75% to 100%. Table 2 shows all scores for all studies.

3.3 Results of studies

A summary of the outcomes measure and main results found in included articles are shown in Table 1.

3.3.1 Child and adolescent health and development

Six studies (Berlin et al., 2006; Isma et al., 2012; Lee & Wang, 2016; Soriano et al., 2016; Walsh & Mitchell, 2013; Walsh et al., 2015) report paediatric nurses have an important role in the promotion and coordination of child and adolescent healthcare, with competencies in health and development, detection and prevention of disease and risk in children.

3.3.2 Health education and advice

Six studies report nurses providing advice to parents about child health and development (Berlin et al., 2006; Kinder, 2016; Larsen et al., 2006; Soriano et al., 2016; Walsh & Mitchell, 2013; Walsh et al., 2015). Some of the topics requiring advice and counselling were infant feeding, nutrition, healthy lifestyle, immunizations, management of acute illness during health visits, mothers' health and well-being, and overweight/ obesity prevention. One study (Kinder, 2016) report parents' satisfaction with nurses was high and nurses' clinical competence was statistically significant to explain the positive relationship with parental adherence to nurses' recommended health plans.

3.3.3 Immunizations

Six studies report nurses managing and providing immunizations as part of children healthcare (Aruda et al., 2016; Berlin et al., 2006; Freed et al., 2010; Soriano et al., 2016; Walsh & Mitchell, 2013; Walsh et al., 2015), and it was another common competency identified in the studies.

3.3.4 Child health checks

Five studies (Berlin et al., 2006; Freed et al., 2010; Soriano et al., 2016; Walsh & Mitchell, 2013; Walsh et al., 2015) report nurses perform child health checks independently, but one of them (Soriano et al., 2016) reports some training needs required, and two studies (Walsh & Mitchell, 2013; Walsh et al., 2015) report limited preparation and access to professional development to improve nurses' skills and knowledge in child health and development care.

3.3.5 Diagnosis and medication prescribing

Aruda et al. (2016) reported medication prescribing as a critical role in child health care. Vlam (2006) reported nurses' competencies in treating and diagnosing children with Attention-Deficit/ Hyperactivity Disorder. Irwig et al. (1985) in their study show how nurses issue medication to treat respiratory signs and symptoms. Three studies report nurses' competencies

in patient's assessment, diagnosis and development of treatment plans (Freed et al., 2010; Irwig et al., 1985; Vlam, 2006).

3.3.6 Identification of acute illness symptoms

Three studies report nurses identify signs and symptoms of acute illness, and provide health advice and education for parents of children with common acute illness, such as fever or respiratory signs/symptoms (Irwig et al., 1985; Walsh & Mitchell, 2013; Walsh et al., 2015).

3.3.7 Overweight and obesity prevention

Three studies (Isma et al., 2012, 2013; Larsen et al., 2006) report nurses' competences in childhood overweight, obesity prevention and detection. Isma et al. (2013) reported nurses' insufficient knowledge and skills to recognize and manage childhood overweight. One study (Larsen et al., 2006) identified nursing interventions to prevent obesity in children such as body mass index calculation, adequate nutrition and physical activities promotion, reducing sedentary behaviours and health education for parents of children at risk.

3.3.8 Asthma care

Two studies (Walsh & Mitchell, 2013; Walsh et al., 2015) report nurses' roles in asthma care to children such as education for parents on asthma signs and symptoms, triggers, treatment and the correct use of asthma devices.

3.3.9 Competence in sexual abuse and maltreatment

Only one study (Ceccucci, 2018) reported on nurse practitioners' competences in evaluating sexual abuse, providing a definite opinion, and testifying in sexual abuse cases. Ceccucci (2018) reported poor nursing competence on child abuse and their need for training, and showed nurses' low adherence to guidelines when dealing with child sexual abuse. Aruda et al. (2016)

found that identifying and reporting child maltreatment were critical roles in children health care.

3.3.10 Health risk assessment

Two articles (Berlin et al., 2006, 2008) report nurses' competences with children of parents of foreign origin. They consisted in the assessment of health risk through child physical and mental health, psychosocial development, and home environment. Berlin et al. (2006) reported nurses' level of cultural competence was unsatisfactory as it was also the quality of nurses' healthcare to children and parents of foreign origin.

3.3.11 Oral health

One study (Dumas et al., 2013) reports on this topic with nurses performing oral health assessment on young patients during routine well-child check-ups.

3.3.12 Routine checks for HIV in children

One study (Horwood et al., 2010) reports competences of trained nurses according to Integrated management of childhood illness /HIV guidelines in routine checks of sick children for common signs and symptoms of HIV infection. However, a poor follow -up of HIV exposed children, of nurses' knowledge, HIV management and communication skills, training, supervision and supporting policy guidelines was described.

3.3.13 Tuberculosis management

One study (Vellema et al., 2008) reports nurses' competences in the management of paediatric tuberculosis and knowledge on tuberculosis diagnosis, but identified deficiencies in nurses' knowledge on tuberculosis management and limited screening of children's contacts.

4 DISCUSSION

This comprehensive literature review is, in our knowledge, the first one conducted to explore the autonomous competencies of nurses' healthcare to the paediatric population in primary care settings. The gap in the literature about paediatric nurses' competencies in primary care made imperative to perform this systematic review. The studies identify the specific nursing competencies performed independently from other health care professionals in primary care settings through the analysis of data exploring nursing competencies performed at workplace.

The lack of doctors and paediatricians in primary health care worldwide urges the need to find alternative ways to attend the health requirements of the population with similar high-quality levels of care. The delegation of clinical activities from a health care provider to another is a strategy aimed to address the shortage of physicians and ensure health coverage to the population with a high level of quality and efficiency. A preview research (Maier & Aiken, 2016), who analysed the extent of task shifting in primary care in 39 countries shows nurses perform an extensive task shifting in countries like Australia, Canada, England, Northern Ireland, Scotland, Wales, Finland, Ireland, Netherlands, New Zealand, and the USA. In these countries nurses have academic qualifications and take up advanced roles and activities usually performed by doctors such as prescriptions, diagnosis, test ordering, responsibility for a panel of patients, treatment authority, referrals, and first point of contact. Task shifting has also been considered in preventive child health care where trained nurses have shown to be competent to perform medical screenings (Benjamins, Damen, & Van Stel, 2015). Furthermore, two systematic reviews suggest that nurses provide high-quality care with the same outcomes as physicians (Laurant et al., 2018; Martínez-González, Rosemann, Djalali, Huber-Geismann, & Tandjung, 2015).

Studies in this review were conducted in high- income countries: the USA, Sweden, Spain, and Australia. Studies carried out in the USA (Aruda et al., 2016; Ceccucci, 2018; Dumas et al., 2013; Freed, et al., 2010; Kinder, 2016; Larsen et al., 2006; Vlam, 2006) show that nurses

providing health care have advanced practice skills. Healthcare delivery in the USA is based on a reimbursement system (fee-for-service). Medicare and Medicaid, both funded by federal and state governments, and private health insurers are the three types of payers responsible for funding healthcare, and the policy-makers for the reimbursement of healthcare services (Chapman, Wides, & Spetz, 2010). Nurse practitioners are specialized in primary care fields such as adult health, family practice and paediatric care. Physicians and nurse practitioners deliver primary health care to children and adolescents focused on child development (Hawkins-Walsh et al., 2011; Kuo et al., 2006), and some states support nurse practitioners independent practice as primary care providers to their own patient panels (Poghosyan et al., 2017). Despite nurse practitioners deliver healthcare services like physicians, their rates are usually lower, and often they are not credentialed as primary care providers by the reimbursement system (Hansen-Turton et al., 2013). This review reported that nurse practitioners in the USA peform advanced practice tasks such as medication prescribing, recognizing and reporting child maltreatment, immunization management, medical forensic examination on sexually abused children, oral health assessment, well-child examinations, treatment plans, diagnosis, and prevention of childhood obesity.

In the European Union, children and adolescents' access to primary health care services depends on the country. Literature shows that most preventive public health care programs for children and young people consist of a general physical and psychosocial examination, systematic screenings in asymptomatic children, immunization, and health education (Bezem, Theunissen, Buitendijk, & Kocken, 2014; Bezem et al., 2017; Wieske, Nijnuis, Carmiggelt, Wagenaar-Fischer, & Boere-Boonekamp, 2012; Wood, Stirling, Nolan, Chalmers, & Blair, 2012), where nurses are part of the primary healthcare teams. The studies performed in Europe (Berlin et al., 2006, 2008; Isma et al., 2012, 2013; Soriano et al., 2016) were conducted in Sweden and one in Spain. Sweden and Spain have public health systems (Kuo et al., 2006). In Sweden, primary child health care services are voluntary and free of charge and are provided by family

practitioners, paediatricians, and nurses in primary child health centres (Berlin et al., 2006; Kuo et al., 2006). In accordance with the literature, the studies identified that primary child health nurses provide preventive care and counselling, detect and prevent illness and risk in children from birth to the age of six, asssess health risk in children with parents of foreing origin, and pevent and monitor overweight in childhood. In Spain, paediatricians and nurses collaboratively attend children from birth to 14 years of age. In this country, family and community nursing and paediatric nursing specialties were developed over the last years. The paediatric nurse specialist delivers nursing care on health promotion and disease prevention to the healthy and ill children, and their rehabilitation (Pedraza Anguera, 2011), in all levels of health care. In line with the expected competencies from the paediatric nurse, Soriano et al. (2016) reported nursing skills in relation to the monitoring of children physical development, healthy lifestyle assessment, health advice, and management of immunization side effects. Training needs were identified, which could account for the fact that nowadays it is not mandatory to be a specialist paediatric nurse to deliver primary health care to children in Spain.

In Australia there is universal health care coverage and health care is provided by a public service and private sector insurances. Primary care consultations are led by general practitioners and other health care providers, are funded by Medicare and administered by the federal government (Scanlon, Cashin, Bryce, Kelly, & Buckely, 2016). Child and Family Health services focus on health promotion and well-being of children and families. Nurses working in these services deliver universal child health services (Fraser, Grant, & Mannix, 2016). They are registered nurses with postgraduate qualifications in child and family health who undertake well-child health assessment, advice on health promotion and disease prevention to children from 0 to 5 years of age (Johnston, Sunners, & Murphy, 2020). Nurses offer child health services in different community settings such as child and family health centres, community health centres and home visits. Depending on the state, in Australia they are known as maternal child and family health nurses, or child and family health nurses, whereas in other countries they are

referred as health visitors, plunket nurses or public health nurses (Fraser, Grant, Mannix, & Grant, 2014). Fraser et al. (2014) in a scoping review of the literature found child and family health nurses' roles were comprehensive and diverse, and they identified specific areas of child health maintenance, surveillance, and health promotion. These findings differ from our findings in studies carried out in Australia. We found (Walsh & Mitchell, 2013; Walsh et al., 2015) that practice nurses perform child health care in general practices and are an integral part of the primary healthcare team. Although their roles have expanded, they do not have an advanced practice training in child health. Practice nurses and general practitioners provide care to children from birth to adolescence. Studies (Walsh & Mitchell, 2013; Walsh et al., 2015) reported practice nurses have a significant role in well and sick child health care. While nurses provide healthcare for children in the areas of development, preventive topics and immunizations, physicians attend children with acute health problems or chronic conditions (Walsh et al., 2015). Both studies reported limited nurses' preparation in child health care, which could be explained by their lower academic training as compared to nurse practitioners and the rapidly extended nursing roles over the recent years.

In this review the studies related to middle- income countries were carried out in South Africa and China. The Report on the Review of Primary Health Care in the African Region (World Health Organization, 2008) highlighs the lack of resoures and the shortage of qualified health workers as the major impediment to the development of primary health care.This varies among countries and results in inequal acces to health care services. Some strategies were adopted in primary healthcare to children such as immunizations, breast feeding, nutrition policies, free health care for children under six, and free treatment for malnutrition and diarrhoeal diseases. Some of them are strategies headed to address illnesses in children (World Health Organization, 2008). Along these lines, the studies conducted in South Africa (Horwood et al. , 2010; Irwig et al., 1985; Vellema et al., 2008) reported nurses are involved in the identification and management of children conditions in primary health care settings. In China, well-child health

care is an important aspect of the national basic public health services and is free of charge for children from 0 to 6 years old. Well-child health care guidelines reported care including immunizations, routine health checks, family visits, high risk child management, haemoglobin screening, health education, and health follow-ups (Mao et al., 2018). However, scarce evidence was found about nurses' competencies in China. Lee & Wang (2016) identified paediatric nurses' competences in adolescent health and development.

The most largely identified and described clinical skills in the studies were Health education and advice, Child and adolescent health and development, Immunization, and Child health checks. Most of the studies found were broadly descriptive, which along with the heterogeneity of the results show a lack of scientific evidence in relation to the competences of paediatric nurses in primary care. Many studies described the competencies performed by nurses; however, competences were not assessed as such but rather as clinical practice, knowledges, parents' satisfaction with care, and training requirements. Nurses providing child health care have specific skills in disease prevention and health promotion. Nurse practitioners furthermore perform advanced practice activities to address illness, curative and rehabilitative care. Although nurses in countries like the USA and Australia have an advanced practice training, limitations such as funding of healthcare systems and reimbursement models, and policy regulation restrict their scope of practice. Nurse practitioners deliver the same primary health care services than physicians at a lower cost and often are not credentialed as health care providers.

Identifying nurses' autonomous competencies in children's primary healthcare services is the first step to assess and measure their impact on child population in terms of health and efficiency. It will allow the identification of nurses' strengths and enhance them, as well as detect nurses' weaknesses and their training needs in relation to children healthcare. By providing the required training and introducing funding and policy regulation reforms, it might be possible to enhance the development of nurses' autonomous roles in disease prevention and health

promotion. This will contribute to uphold high quality children's healthcare services and improve access to healthcare while facing the acute shortage of primary care doctors.

4.1 Strengths

A strength of the systematic review was the comprehensive search strategy through multiple databases and a source for grey literature. Furthermore, this review considered quantitative, qualitative, and mixed- method studies to enhance the breadth of the research. The methodological quality of the studies included in this systematic review was considered good in most of them. Twelve out of the eighteen studies included in the systematic review took place in the last 10 years, with only 6 being prior to 2010.

4.2 Limitations

Despite the high methodological quality of the studies included in this review, an important limitation of this research was the small number of studies recorded. Many studies were descriptive in relation to nurses' competencies in child healthcare. Furthermore, quantitative studies included in the qualitative synthesis provide scarce evidence. The heterogeneity of outcomes data in quantitative research did not allow the meta-analysis. Some important limitations of this systematic review are the lack of studies directly measuring the clinical competencies of paediatric nurses, and the fact that many outcomes are referred to as activities of clinical practice, knowledges, or training requirements. Also, the heterogeneity of the outcomes has hindered the synthesis of the main findings of this systematic review. Therefore, scientific evidence to support paediatric nurses' competencies performed autonomously in primary health care is needed with an appropriate sample size, participants' selection and a solid methodology design to ensure the validity of results.

5 CONCLUSIONS

No consistent scientific evidence is available about paediatric nurses' clinical competencies in health promotion and disease prevention in primary health care. Studies describe nurses' clinical skills in childhood, but results do not show firm consistency when assessing their practice scope. More research is necessary to identify the autonomous paediatric nurses' competencies in primary care settings worldwide. Since primary care nurses are frequently the health professionals that families with children have access to, government health care policies aiming to preserve quality and equity of health care to child population should first identify and enhance the development of nurses' competencies in relation to health promotion and disease prevention. Through adequate education programmes nurses would feel confident to develop their clinical skills in children primary care.

Additional support information may be in Appendix A.

CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

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Table 1.
Summary of included studies.

Authors, year, country, study design	Study population: sample size, source, age: mean (SD) or median (range)	Research methods	Outcomes measure	Key findings/ Results
Aruda et al., 2016, USA, retrospective observational study	3 National RDS conducted by American Nurses Credentialing Centre in 2003, 2008, and 2011, a representative sample of PPCNPs in clinical practice.	Comparisons of three National RDS in 2003, 2008, and 2011. RDS process, a representative sample of PPCNPs in clinical practice and certified within the last 5 years.	Activities of clinical practice and critical roles in delivering health care to children of PPCNPs.	- PPCNPs are performing critical roles in delivering health care to children: the current top activities were prescribing medication for the paediatric population, recognizing and reporting child maltreatment, and effectively advocating for and managing immunizations.
Berlin et al., 2006, Sweden, cross- sectional	n= 270 (70%) PCHNs, PCHC centres, 50 (27-64) years.	Questionnaire consisted of a total 30 items in 4 areas.	- PCHNs' background and formal competence. - Working conditions. - Opinions regarding cultural competence. - Overall opinions and open-ended questions.	- Many nurses had no formal training in cultural competence and the majority felt that their formal and clinical cultural competence was insufficient. - PCHNs reported inadequate working conditions and dissatisfaction with the quality of their healthcare work with children and parents of foreign origin. PCHNs lacked available written guidelines, support, and help with their healthcare work. - Factors that increased the PCHNs' experiences of difficulties: having professional experiences within PCHC services for more than 20 years, working 50% or more on child-healthcare assignments, and when more than 50% of the children they were responsible for were of foreign origin.
Berlin et al., 2008, Sweden, grounded theory qualitative study	15 PCHNs, Primary Child Health Care services.	Face-to-face in-depth interviews. Lasted between 45 to 95 min.	PCHNs' important factors in the interaction with children and parents of foreign origin. Action taken in different situations and how difficulties were resolved.	- PCHNs' routine in children and parents of foreign origin consisted of direct assessment of all children regarding their behaviour, height and weight development, and the interaction between parents and their children. - Assessing health risk means assessing child's physical and mental health, psychosocial development, and home environment. - To address difficulties in the assessment risk process PCHNs use elucidating strategies: active (as home visits or much frequent contact with the family) and/or passive strategies (wait- and-see approach).

Note: (RDS) Role Delineation Studies; (PPCNPs) Paediatric Primary Care Nurse Practitioners; (PCHNs) Primary Child Health Nurses.

Table 1.
Summary of included studies (continued).

Authors, year, country, study design	Study population: sample size, source, age: mean (SD) or median (range)	Research methods	Outcomes measure	Key findings/ Results
Ceccucci, 2018, USA, cross-sectional	n= 110 NPs, Primary Care setting, 50.04 years	Self-administered email survey through a non-validated questionnaire "Child Maltreatment Evaluation in Paediatric Primary Care" and Survey Monkey platform to collect data.	NPs rates of adherence with sexual abuse clinical guidelines and NPs' perceived knowledge, competence, and comfort level caring for sexually abused children.	- Very few NPs (25.5%) felt competent to perform a medical forensic examination on a sexually abused child, fewer (17.3%) felt competent to render a definitive opinion on sexual abuse or to testify in court (12.7%). - 78.2% NPs wanted more training on evaluating child sexual abuse. - 77.3% preferred to refer children who are suspected of sexual abuse to a local expert but only 80% usually file a child protective service report if they suspect child abuse. - 70.9% thought referral to an interdisciplinary specialty clinic was best for the evaluation. - 74.5% identified a local resource available for referral.
Dumas et al., 2013, USA, cross-sectional	n= 28 Paediatric PCPs, 118 exams performed by PCPs; children mean age 34 months (SD 15 months). 90 (76%) exams performed by NP and attending. 121 by hygienist, Clinic.	Paediatric PCPs perform oral health assessment on young patients during routine well-childcare, children between 15 months and 5 years. A Dental hygienist as the gold standard in the identification of visible plaque exams.	Sensitivity, specificity, positive predictive value, negative predictive value, percentage agreement, and k statistic were calculated for PCP visible plaque exam using hygienist's exams findings.	The visible plaque exam conducted by Paediatric PCP during well-childcare may not be accurate. Agreement with hygienist measured as a k score was 0.34.
Freed et al., 2010, USA, cross-sectional	n=550 PNPs in states that allow independent practice and n=650 PNPs in states that do not, Primary Care setting and Specialty Care settings.	Mail survey of a random national sample of 1200 PNPs stratified according to states that license NPs to practice independently of supervision of physician. (15 fixed-choice items and 1 open-ended item).	Roles focus of practice, professional setting, and professional responsibilities of PNPs.	- 59% PNPs worked in primary care. 64% PNPs did not provide care in inpatients settings.11% PNPs practiced independently in states that allow independent practice. - PNPs in primary care and specialty care reported that often or sometimes perform most general practices roles, such as development of treatment plans, patient's assessment, and diagnosis. - 86% PNPs in primary care provided often or sometimes immunizations (35% PNPs speciality care) and well child examinations 89% (30% PNPs speciality care).

Note: (NP) Nurse Practitioner; (PCPs) Primary Care Providers; (PNP) Paediatric Nurse Practitioner.

Table 1.
Summary of included studies (continued).

Authors, year, country, study design	Study population: sample size, source, age: mean (SD) or median (range)	Research methods	Outcomes measure	Key findings/ Results
Horwood et al., 2010, South Africa, descriptive qualitative study	IMCI- trained nurses in two provinces (Limpopo and KwaZulu- Natal), Primary Health Care clinics.	10 focus group discussion conducted 5 with IMCI-trained nurses and 5 with mothers and caregivers in two provinces. IMCI coordinators selected up to 10 IMCI- trained nurses who would contribute to a discussion on IMCI[1] implementation.	Caregivers and Nurses' attitudes toward, and experiences of, implementation of routine checks for HIV in the context of IMCI implementation.	- Nurses lack the skills in HIV management and communication to implement the HIV component of IMCI for identification and management of HIV- infected and exposed children. Provision of HIV care for children depends on the ability and willingness of nurses.
Irwig et al., 1985, South Africa, cross- sectional	n= 31 PHC nurses, paediatric polyclinic practices.	370 paediatric patients under 3 years with symptoms or signs of respiratory illness were examined by a nurse. After, two doctors (paediatricians), alternating order of evaluation re-examined the patient.	Assess the detection of 10 "important" respiratory signs with significant medical or therapeutic implications.	- Paediatric PHC nurses are expected to record patient's histories, examine, and manage children's health problems. - Management according to the symptoms and signs and the protocols include giving advice, issuing medication (including antibiotics), and referral to a doctor. Soweto paediatric PHC nurses were competently detecting respiratory signs in children, though they over-diagnosed follicular tonsillitis.
Isma et al., 2012, Sweden, phenomenography qualitative study	n= 18 CHC- nurses, from 17 CHC centres, 51(32-63) years.	Individual open- ended interviews. Lasted between 26 to 90 min.	CHC-nurses' perceptions of childhood overweight.	CHC- nurses have the potential to play an important role in the prevention of childhood overweight and obesity. There was a tendency by CHC- nurses to minimise the concern about overweight in younger children.
Isma et al., 2013, Sweden, phenomenography qualitative study	n=18 CHC- nurses, from 17 CHC centres, 51(32-63) years.	Individual semi-structured interviews, phenomenographic approach. Lasted between 26 to 90 min.	CHC- nurses' understanding preventive work with childhood overweight.	CHC- nurses conceive their work with overweight (prevention and monitoring) in Child Health Care as complicated and constrained by several obstacles such as nurses' personal overweight priorities, knowledge, responsibility, absence of resources and cooperation, lack of uniform guidelines for preventing and managing childhood overweight, and a deficient management organization.

Note: (IMCI) Integrated management of childhood illness; (PHC) Primary Health Care; (CHC) Child Health Care.
[1]Integrated management of childhood illness (IMCI), is a WHO/UNICEF strategy for improving morbidity and mortality in under 5 children attending first level facilities in developing countries.

Table 1.
Summary of included studies (continued).

Authors, year, country, study design	Study population: sample size, source, age: mean (SD) or median (range)	Research methods	Outcomes measure	Key findings/ Results
Kinder, 2016, USA, descriptive correlational study	n= 91 PNPs, Primary Paediatric practice settings, from 18 to 62 years.	Two instruments: - Parents' Perception of satisfaction with Care from Paediatric Nurse Practitioners (PPSC- PNPs instrument). - Visual Analog Scale (VAS)(100mm). - A 19 item demographic data questionnaire was included.	- 4 components of satisfaction: communication skills, clinical competence, caring behaviour, and decisional control. - Overall satisfaction of parents with PNP care after the health visit. - Parental intent to adhere to recommended health regimen from PNP.	- Parents scored high overall satisfaction with care and the 4 components of satisfaction (communication skills, clinical competence, caring behaviour, and decisional control). - Clinical competence on child's health care had the strongest positive relationship and was the single variable to explain parental attempt to adhere to recommended health regime from PNP.
Larsen et al., 2006, USA, cross-sectional	n= 99 (34%) NPs (FNPs and PNPs) from Intermountain area, Primary Care Family or Primary Care Paediatric settings, 45 (27-66) years.	Mail questionnaire based on documented risk factors for childhood obesity as well as prevention guidelines developed. Likert type scale, from 1 to 5. Three open-ended question about barriers and resources in dealing with childhood obesity prevention, and demographic questions, background, and practice experience.	Prevention practices of NPs regarding childhood obesity: - Calculate body mass index (BMI) and serial plotting for screening of overweight. - Counsel parents about nutrition practices, physical activity, reducing sedentary behaviours, and parental skills. - Take dietary, physical activity, and television/media histories. - Identify and target at-risk children. Guidelines use. Resources for and barriers to implementing prevention practices.	- NPs perform prevention practices to address childhood obesity. - NPs working in family practice or general paediatric practice settings were not consistently using the BMI as an age index for childhood obesity. They were teaching parents to promote healthy food choices and physical activity in their families. The main sources NPs used in preventing childhood obesity were dietician, journal articles, and Web sites.
Lee and Wang, 2016, China, mixed method: **(a) quasi- experimental** **(b) focus group interviews**	(a) n= 57 PNs, Paediatric and Adolescent Health settings, 29.35 (26-50) years. (b) 5 PNs focus group (n =26), 38.6 (SD 11.8) years.	(a) PNs received educational intervention in adolescent healthcare, 5 days a week for 3 weeks. Data were collected before and after training programme (pre and post-tests). Tool: validate self-assessed Adolescent Worker Competency Checklist of the WHO's adolescent health domains. (b) Five conducting focus group interviews. Open-ended interviews.	(a) PNs' practice competences in adolescent health and development, in assessing, planning, and implementing adolescent health projects in the community. (b) PNs' feelings about assessing and managing adolescent health after the educational intervention.	(a) PNs demonstrated increased competencies in adolescent healthcare practice after a structured training program. (b) Qualitative data showed positive and encouraging experiences and feedback from PNs.

Note: (PNPs) Paediatric Nurse Practitioners; (NPs) Nurse Practitioners; (FNPs) Family Nurse Practitioners; (PNs) Paediatric Nurses.

Table 1.
Summary of included studies (continued).

Authors, year, country, study design	Study population: sample size, source, age: mean (SD) or median (range)	Research methods	Outcomes measure	Key findings/ Results
Soriano et al., 2016, Spain, cross-sectional	n=253, 65% (175) paediatricians and 35% (78) nurses, Primary Health Care settings.	On-line self-administered surveys to paediatricians and nurses in Valencian Autonomous Community.	Nurses' autonomy, competence and skills, acceptance, and training needs in WCC visits.	- Main nursing skills have been considered: advice on feeding, healthy lifestyle, and immunizations. - Nurses' training in physical assessment consideration was lower than 50%, except for visual acuity, which was 80%. - In relation to the knowledge area, needed skills were present between 70-89%. - 50% respondents recognize training needs in each one of 19 proposal activities.
Vellema et al., 2008, South Africa, mixed method: **(a) cross- sectional** **(b) descriptive qualitative study**	59 PHC nurses and 2 enrolled nurses, and 1 community volunteer supporter as the responsible for TB management in children, 62 provincial government public health facilities (36 permanent clinics, 17 mobile clinics and 9 community health care centres). 39 (24-61) years.	(a) Self-administered questionnaire completed by PHC nurses. (b) Facility site visits were conducted by the Principal Investigator to assess whether PCH nurses were equipped to diagnose TB in children. 491 records were reviewed.	(a) Respondent's previous TB management training and perceived need for training, involvement in management of paediatric TB, and explored PHC workers knowledge relating to TB diagnosis in children. (b) A check list structured review and records were reviewed.	Nurses are the vast majority of PHC respondents. TB Score Chart was not widely used. Facility audit revealed deficiencies in knowledge and practice related to TB diagnosis in children and detected limited screening of TB child contacts of confirmed smear positive adults.
Vlam, 2006, USA, cross-sectional	n= 101 APRNs who diagnosed or treated ADHD or did both, Family practice, private practice, child and adolescent psychiatric, paediatric clinic, primary and emergency care, rural care and other practice settings.	Self-administered email questionnaire from APRNs (17 items questionnaire: 3 demographic, 8 nominal, 3 interval and 3 open- ended questions).	APRNs' comfort levels with treating and diagnosing ADHD.	- 83.2% APRNs diagnose children with ADHD and 98% treat them in their practices. - The majority of APRNs working with children are comfortable with diagnosing (52.5%) and treating (64.4%) ADHD. - APRN following the AAP diagnostic guidelines for diagnosing ADHD in children more closely than paediatricians and family physicians (compared to other studies).

Note: (WCC) Well Child Care; (PHC) Primary Health Care; (TB) tuberculosis; (APRNs) Advanced Practice Registered Nurses; (ADHD) Attention-Deficit/ Hyperactivity Disorder; (AAP) American Academy of Paediatrics.

Table 1.
Summary of included studies (continued).

Authors, year, country, study design	Study population: sample size, source, age: mean (SD) or median (range)	Research methods	Outcomes measure	Key findings/ Results
Walsh and Mitchell, 2013, Australia, cross- sectional	n= 29 respondents PNs (13.2%), one rural Division of General Practice, (47.2 +/-7.6) years.	Mixed method instrument to collect qualitative and quantitative data. Through a purpose-development questionnaire (71 items comprised 6 sections, 4 of which open-ended questions).	PNs' child health roles and responsibilities, professional development needs, barriers and facilitators to PNs' professional development, and role satisfaction.	- PNs reported a significant role in well and sick childcare as well as advising, educating, and counselling parents on child health and development issues from birth to adolescence. - Roles included: 92.3% immunisations, 65.4% child health checks, 26.9% general child health and development, 23.1% asthma, 15.4% feeding, 11.5% fever, 11.5 settling/sleeping, and 7.7% adolescents' mental health counselling. - PNs are interested in increasing their knowledge and incorporating more child health into their practice. - Needs was 80% professional development in childhood growth and development, 60% in health and illness and 20% advising new mothers.
Walsh et al., 2015, Australia, cross-sectional	n= 159 PNs, General Practices, 47.2 (9.2) years.	PNs completed a national online survey. - 31 items representing key child health PNs' roles. - 14 items representing the range of difficulties reported by PNs. - 14 items collecting demographic dates. - 10 items assessing workplace satisfaction measured using a 7-point Likert scale.	PNs' roles and responsibilities in educating, advising and reassuring parents in well and sick childcare, professional development and satisfaction in the PN role.	- PNs reported a significant role in well and sick childcare. Frequent activities included immunization, phone triage/advice, child health/development advice, wound care, and Healthy Kids Checks. - PNs were interested in extending their role and incorporating more child health activities into their practice.

Note: (PNs) Practice Nurses.

Table 2. Risk of bias of studies included.

	Quantitative study	Qualitative study	Mixed – method study (quantitative /qualitative)
Aruda et al., 2016 (retrospective observational)	15/22 (68.18%)		
Berlin et al., 2006 (cross- sectional)	21/22 (95.45%)		
Berlin et al., 2008 (grounded theory)		20/20 (100%)	
Ceccucci, 2018 (cross- sectional)	21/22 (95.45%)		
Dumas et al., 2013 (cross- sectional)	20/22 (90.90%)		
Freed et al., 2010 (cross- sectional)	21/22 (95.45%)		
Horwood et al., 2010 (descriptive qualitative)		19/20 (95%)	
Irwig et al., 1985 (cross- sectional)	19/22 (86.36%)		
Isma et al., 2012 (phenomenography)		20/20 (100%)	
Isma et al., 2013 (phenomenography)		20/20 (100%)	
Kinder, 2016 (descriptive correlational)	21/22 (95.45%)		
Larsen et al., 2006 (cross- sectional)	21/22 (95.45%)		
Lee and Wang, 2016 (quasi- experimental/ focus groups)			21/22 (95.45%) / 17/20 (85%)
Soriano et al., 2016 (cross- sectional)	21/22 (95.45%)		
Vellema et al., 2008 (cross- sectional/ descriptive)			13/22 (59.09%) / 15/20 (75%)
Vlam, 2006 (cross- sectional)	18/22 (81.81%)		
Walsh and Mitchell, 2013 (cross- sectional)	19/22 (86.36%)		
Walsh et al., 2015 (cross- sectional)	15/22 (68.18%)		

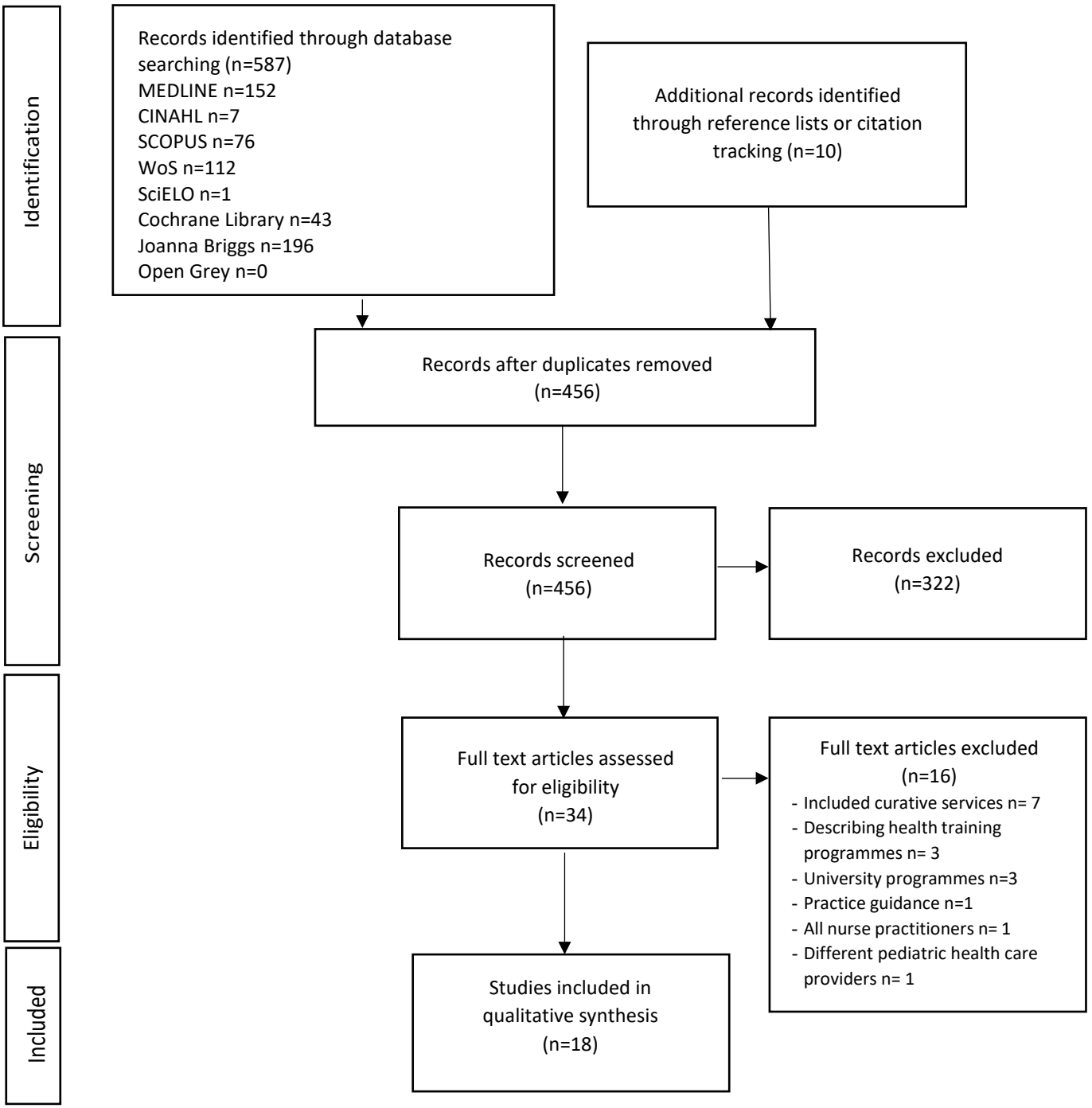

Figure 1. Flow diagram of the literature search and study selection process (PRISMA statement).

Appendix A.

Nurses providing healthcare for children from birth to adolescence in primary care settings with disease prevention and health promotion interventions worldwide were identified with a wide heterogeneity of terms and particular academic training requirements with variations among countries: nurse practitioners (Ceccucci, 2018; Dumas et al., 2013; Larsen et al., 2006), paediatric nurse practitioners (Freed, et al., 2010; Kinder, 2016; Larsen et al., 2006), nurses (Horwood et al. , 2010; Soriano et al., 2016), paediatric primary care nurse practitioners (Aruda et al., 2016), paediatric nurses (Lee & Wang, 2016), practice nurses (Walsh & Mitchell, 2013; Walsh et al., 2015), child health care nurses (Isma et al., 2012, 2013), primary child health nurses (Berlin et al., 2006, 2008), primary health care nurses (Irwig et al., 1985; Vellema et al., 2008), family nurse practitioners (Larsen et al., 2006), advanced practice registered nurses (Vlam, 2006). This wide number of names to refer to the nurse providing children healthcare in primary care can hinder the identification and analysis of found data.

The studies take place in different primary health centres. Primary care settings were identified with a variety of names such as Primary Health Care settings, Paediatric and Adolescent Health settings, General Practices, Clinics, Child Health Care centres, Primary Health Care clinics, Primary Child Health Care services, Paediatric Polyclinic practices, Primary Care Family, Primary Care Paediatric settings, Public Health facilities, mobile clinics, Community Health Care centres, Primary Care settings, Primary Paediatric practice settings.