Review article

How nurses and other health professionals use learning principles in parent education practice: A scoping review of the literature

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ABSTRACT

Background: Health Professionals (HPs) play an important role in supporting parents to care for their children, by facilitating parents' knowledge and skills development through parent education. This is achieved through teaching, whereby planned strategies, based on principles of how people learn, enable learning. Despite Learning Principles being the fundamental tenets of the learning process, how HPs perceive and use Learning Principles in their practice is neglected in the healthcare literature.
Objective: To identify, describe and map the existing literature on nurses' and HPs' perceptions and use of Learning Principles in parent education practice.
Method: A scoping review was performed using the Joanna Briggs Institute approach. A comprehensive search of 10 databases and the grey literature was undertaken between March and June 2017 to identify pertinent English-language publications. The search was limited to literature published between 1998 and 2017. Following a screening and inclusion criteria eligibility check, 89 articles were selected for inclusion.
Results: HPs' perceptions of Learning Principles were diverse, somewhat disorganised, divergent in meaning and implicit. This was until the Dimensions of Learning construct was applied to guide the analyses and mapping. This revealed that HPs, of whom 60.7% were nurses, used Learning Principles in parent education, but only referred to them in the context of Adult Learning. Enablers to HPs using Learning Principles included shared partnerships between parents and HPs, while barriers included parents' health beliefs, psychological issues and organisational assumptions about learning. Evaluation of parents' learning also represented implicit use of Learning Principles by HPs.
Conclusion: This scoping review is the first to examine HPs' perceptions and use of Learning Principles within parent education practice. The findings reveal a significant gap in this body of knowledge. The paucity of studies containing any explicit descriptions of Learning Principles strongly supports the need for further exploration and codification of Learning Principles, through qualitative methods, whereby a deeper understanding of what is happening in healthcare practice can be established.

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What is already known about the topic?

- Health Professionals, especially nurses, commonly provide educational support to parents.
- To optimise parent learning, health professionals must incorporate the principles of both teaching and learning into parent education practice.
- Currently, the parent education literature focuses on teaching strategies and their outcomes rather than descriptions of the Learning Principles required in any learning process.
- Exploration of how Learning Principles are perceived and used by health professionals, especially nurses, in their parent education practice, is overdue.

What this paper adds

- This is the first known review to explore, describe and map how Learning Principles are used in parent education practice.
- The review identified that when Learning Principles were used, parent learning, capabilities and the overall parent education experience were optimised.
- The review identified that Learning Principles, which were implicit, often described as teaching strategies or not described at all potentially limited HPs' parent education practice and parents' learning experiences.
- A direction for future research will be to identify how health professionals, perceive and use Learning Principles in their parent education practice.

1. Introduction

Parent education is a professional responsibility of most health professionals (HPs). As educators, HPs provide the information necessary to facilitate parents to assume the role of caring for their children [1]. Parent education practice uses collaborative teaching and learning processes of constructed opportunities to improve parents' health literacy and knowledge, build life-skills, healthy relationships and supports behaviour changes to enable parents to improve their families' health [2]. Parent education practice should draw upon evidence-based 'learning theories' to help parents learn and understand the 'what, why, how and when' of required care [3,4]. However, rather than helping HPs to understand 'how people learn' within a learning process, the health literature emphasises the 'teaching activities' they use, which are commonly built around Andragogy, or the philosophy of educating adults as learners [5–8].

The terms 'teaching' and 'learning' have different meanings, and HPs, as educators need to understand these differences in their parent education practice [7]. Teaching describes the strategies whereby information is purposefully communicated to the learner to achieve desired behavioural outcomes, relevant to each learner's situation [8]. Based on research in educational psychology, teaching has also been termed 'the science of instruction' or 'instructional methods', with both terms including strategies to, identify the learner's individualised information needs, preferred learning styles and varying levels of literacy [9,10].

Mayer [9] created the phrase 'the Science of Learning', to differentiate between learning and teaching and to help educators see 'how learning works'. Learning is defined as the process by which learners gain knowledge and skills, interpret and rearrange information, acquire new ways to use knowledge meaningfully, develop problem-solving skills and to undertake tasks with autonomy. A set of fundamental Learning Principles were educed to help guide educators as they facilitated learners to engage with their learning. These principles help learners 'think about their thinking', rather than educators assuming information processing occurs through teaching strategies alone [11,12]. About a decade -later, researchers in healthcare recognised the relevance of the following Learning Principles:

- the learner's 'internal environment' (e.g. emotions), perception of need, meaning, relevance, attitudes to and previous experiences of learning, should be taken into consideration when setting achievable, learner-directed goals.
- learners must gain factual, conceptual and practical knowledge, link new knowledge to existing knowledge, and assist with information processing, organising and storage.
- learners must practise skills in social situations, receive feedback, be motivated, and undertake self-reflection [7].

Despite these teaching and learning principles being clearly defined in educational psychology, they have not permeated the field of health. Instead, HPs have become 'lost' in the overabundance of core 'adult learning principles' of specific theorists, predominantly those of Knowles [13,14], as shown in Table 1 [7]. Moreover, the surfeit of complex learning theories with their complex descriptions, may hinder a HPs' understanding of the Learning Principles they need to apply in any learning process [7]. Although a guide of 10 Learning Principles, was created from the theories of Knowles [13], Gagne [11,12], Bandura [15, 16] and the early cognition of learning research of Marzano et al. [17] to assist homecare nurses' patient education practice this has gained limited attention in the literature [18,19].

The Learning Principles of Marzano et al. [17] that were incorporated into the abovementioned homecare nurses' guide, used many of the Learning Principles described by Gagne [11,12,18]. Marzano et al. [17] created this framework, which they termed the 'Dimensions of Learning'. The purpose of the framework was, to improve teachers' understanding of elements of the thinking processes, which are the critical aspects educators facilitate within their teaching and learning practice. The framework organised Learning Principles into groups, with each group focusing on one of the different types of thinking associated with cognitive learning [20]. As shown in Table 1, this framework enabled educators to link the thinking involved in metacognition (being aware of our thinking as we perform tasks, develop attitudes, motivation, and commitment to the issue at hand), critical and creative thinking (analysing information to gain clarity and forming new ways to use the knowledge), thinking processes (concept formation, problem-solving, decision-making), core thinking skills (gathering and organizing information) and how the thinking skills relate to the content area. In other words, the frameworks helped educators see what they needed to *DO* to help learners think about thinking within their learning process. It was aspects such as these that Holton and Swanson identified as missing, when they updated Knowles' work on Andragogy and adult learning principles, after his death. Table 1 shows comparisons between the frameworks of Knowles and Marzano et al. [17]). These aspects of thinking are important in helping HPs understand how they can support parent learning to manage their children's health autonomously [15].

There appears to be significant knowledge gaps in the health literature about how HPs use Learning Principles in the important area of parent education practice. However, there has not been a comprehensive review of the literature to confirm this. Accordingly, there is a sufficient case to undertake a scoping literature review to identify, describe and

Table 1. The Learning Principles of Knowles [14] and Marzano et al. [17].

Knowles [14] Adult Learning Principles	Marzano et al. [17] Dimensions of Learning
1. Readiness to learn - life related, goals, purposes 2. Motivation to learn -intrinsic value 3. Orientation to learn – problem-centred, contextual	1. *Attitudes and* perceptions: Readiness, a positive attitude to learn, influenced by internal situations (e.g. emotions), safe learning environment see value, relevance of the learning, clearly defined learning goals, motivation,
4. What the learner needs to know, 5. Learners bring prior experience to learning encounters;	2. *Acquire and* integrate *knowledge:* Understand strategies for linking new knowledge to existing knowledge, organising, processing, storing knowledge for later retrieval and use - declarative knowledge (facts) and procedural (practical) knowledge, shape, internalise skills to use later.
	3. *Extend and* refine *knowledge:* strategies include: comparing, classifying, making inductions, deductions, analyse perspective, correct errors, apply reasoning, gain perspectives; use analogies feedback.
	4. *Apply the* knowledge *meaningfully*: strategies include: decision making, problem solving, analysis.
6. The self-concept of the learner, shift from dependence to being self-directed	5. *Habits* of *mind*: Learned skills become 'part of everyday life', learners master critical, creative, self-regulated thinking, operate autonomously.

map the evidence to generate an overview of the topic and to gain a better understanding of how this practice in health is guided [21].

2. Methods

2.1. Design

A scoping review was considered the most appropriate method to explore a diverse range of publications in an under-explored, complex area (i.e. HPs' parent education practice). This type of review will help identify knowledge gaps in the area and examine how Learning Principles are perceived and used in healthcare [22].

2.2. Objective and the research question

The primary objective of the review was to answer the research question: How are Learning Principles perceived and used by HPs in parent education practice? [22].

2.3. Inclusion criteria

Literature published in the English language, reporting the use or proposed use of Learning Principles by any HPs for parent education practice, was searched. We defined Learning Principles as those exemplified by Gagne [11,12], Knowles [13] and Braungart et al. [7] as discussed in the introduction of this paper and as shown in Table 1. No limits were applied to the study design or publication type. Only literature published from 1998 - 2017 were included, as the landmark WHO's Therapeutic Patient Education Guide was published in 1998 [2]. This seminal document emphasised the shift from didactic to collaborative approaches to learning in health education and introduced the concept of learning principles to inform HPs' patient education practice.

2.4. Participants

The review included publications that either involved HPs providing parent education or those that guided HPs' parent education practice. A focus on all HPs, rather than a single professional group (such as nurses), was necessary to capture how Learning Principles are perceived and used in healthcare generally.

2.5. Concept

The concepts explored in this scoping review were the perception and use of Learning Principles by HPs related to parent education practice.

2.6. Context

The context of the Scoping Review was the provision of parent education practice by HPs.

2.7. Search strategy

The Joanna Briggs Institute (JBI) [22], approach to scoping reviews, which built upon the framework of Arksey and O'Malley [23] and Levac, Colquhoun and O'Brien [24], guided the review. The search strategy was developed with guidance from an academic librarian. Key stakeholder involvement, an optional stage of reviews, was not utilised as this was a very early stage of literature exploration [22].

The search was implemented between March and June 2017 by DT. Key search terms included 'Patient education OR teaching'; 'parent OR carer education OR teaching'; 'consumer education OR teaching'; 'nurs*'; 'child health nurse OR plunket nurse OR health visitor'; 'health professional; ' 'allied health professional medical practitioner OR doctor'; 'learning theory OR concept OR principle OR framework'; 'learning need and evaluation OR assessment'. The bibliographic databases searched were EMBASE [Ovid], MEDLINE [Ovid], Pubmed [NLM], Informit [RMIT], CINAHL [EbscoHost], The Cochrane Library [John Wiley], Scopus [Elsevier], Joanna Briggs Institute [Ovid], PsycInfo [Ovid} and ERIC [EbscoHost]. Grey literature was included to help offset reporting bias [22]. Reference lists of included articles were hand-searched to locate any additional relevant literature [22], with authors contacted to locate any cited practice standard/guidelines (hereafter termed standards) that were not available in the public domain. The search string used in Ovid MEDLINE, including Medical Subject Headings (MeSH) is exemplified in Supplementary Table 1. Consistent with most scoping reviews, the quality of included publications was not formally assessed [22]. Citations were exported to Endnote™ to manage duplicate publications. Remaining citations were exported into Covidence® for screening.

2.8. Screening process

The principal reviewer (DT) reviewed the title and abstract of each located publication. Each publication was checked against the Clarivate Analytics Master Journals List 2017 and the Directories of Open Access Journals [25,26] to identify and exclude predatory journal articles [27, 28]. A second author (ML), reviewed 10% of included and excluded publications using Khangura et al.'s [29] liberal accelerated approach. Any disagreements were discussed until consensus was reached. Unresolved disagreements were sent to a third reviewer, (EM), for adjudication. Publications considered eligible for inclusion were then reviewed in full-text and screened by DT and ML using the aforementioned process.

The search and screening decision process is summarised in Figure 1, using a Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow-chart [22,30]. The PRISMA-ScR checklist was also used in the reporting process [31]. While the number of included publications is large for a scoping review, narrowing the focus any further may have omitted pertinent data [21].

2.9. Data extraction

Data were extracted, summarised and charted by DT using a customised data-extraction form that had been pre-checked and agreed upon by the supervisory team members prior to the start of data analysis. As the researcher became more familiar with the characteristics of the literature on the topic, heterogeneous, lengthy and somewhat disparate descriptions of how HPs perceived and used Learning Principles became apparent. Similarities of extracted data to the Dimensions of Learning

Framework (Table 1) was noted by DT, scrutinized by ML, discussed with the supervisory team until consensus was reached that extracted data, specific to Learning Principles, should also be charted against the framework. This required revision of the initial data extraction form to sub-divide Learning Principles into the five categories of Marzano et al.'s Dimensions of Learning (DoL) construct, which then premised data stratification [17]. Extracted data were cross-checked by a second reviewer, (ML) for accuracy and for relevance to the research question, as well as discussed with other team members, for rigor [22]. The types of data included in the extraction form are shown in Table 2.

2.10. Data analysis

Data relating to Learning Principles were extracted, collated, classified, and coded as either reported, implemented, evaluated or not described. Findings were then annotated, interpreted and summarised as
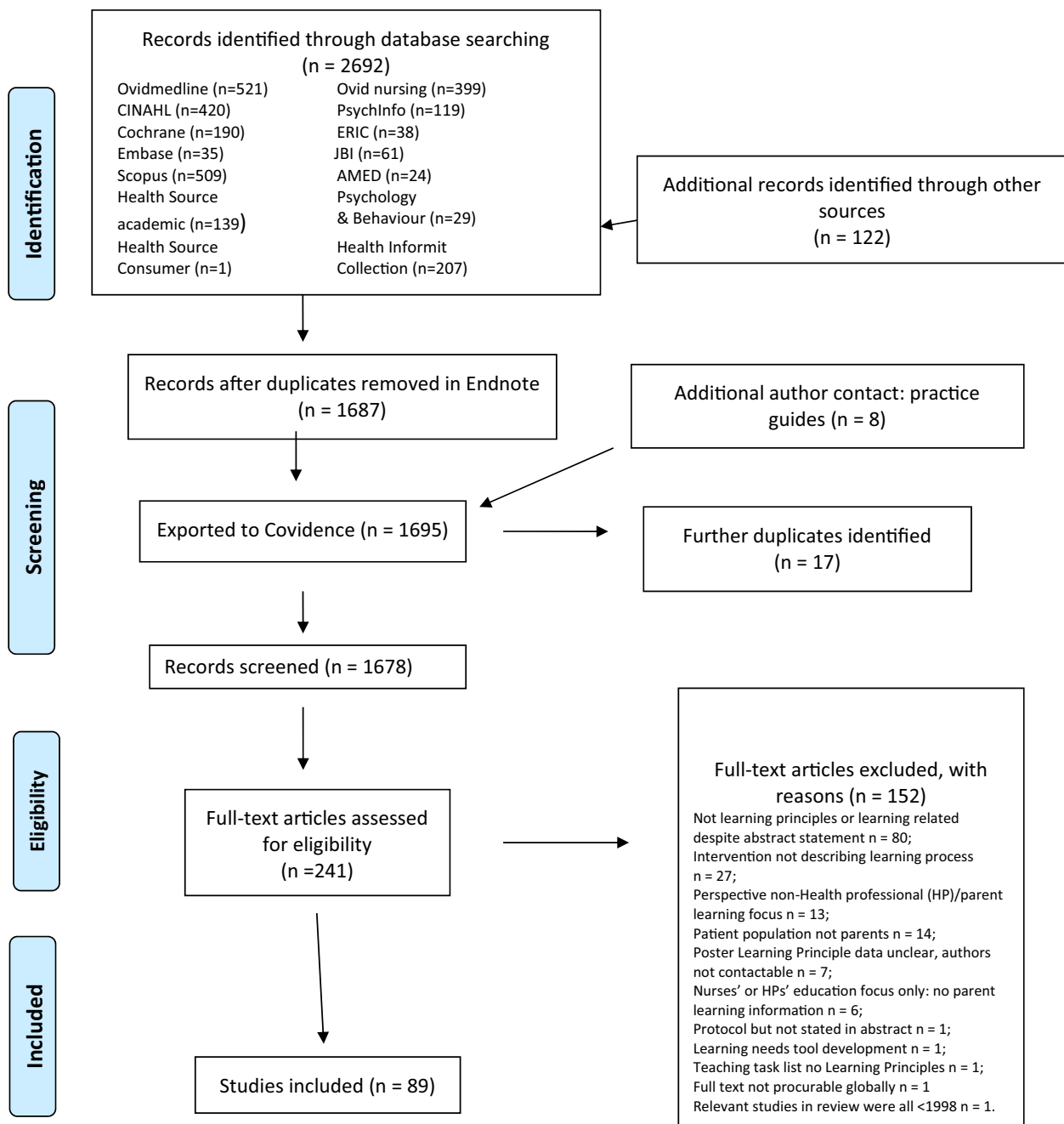

Figure 1. PRISMA Flow Chart of the Review Process [30].

Table 2. Extraction headings for publications, practice standards/guidelines/protocols.

Publications	Practice standards/guidelines
Author (s)	Title, Country, year of publication
Year of publication	Author/organisation
Country/origin	Aim/purpose
Aims/purpose of study	Statement of parent learning needs/HP PEPpractice
Study population	Evaluation of Practice
Type of Health Professional	Learning Principles*
Methodology	Findings
Intervention/Health education encounter	
Learning theory, concept described	
Term for learning or PEP	
Learning Principles*	
Barriers or enablers to PEP	
Evaluation of learning in PEP	
Resource to help HPs use Learning Principles Evaluation in PEP	
Findings	
Learning Principles*	
Dimension of Learning 1: Attitude and Perception	
Dimension of Learning 2: Gain and Integrate Knowledge	
Dimension of Learning 3: Extend and refine Knowledge	
Dimension of Learning 4: Apply Knowledge Meaningfully	
Dimension of Learning 5: Become Productive Habits of Mind	

*The Learning Principle category of each paper [*] was further coded using Marzano et al.'s [20], Five Dimensions of Learning construct according to Table 1 PEP = parent education practice

they were extracted. The coding themes drafted by DT were pre-checked, discussed, revisited and refined by the review team until consensus was reached. The presentation of data was then guided by the Dimensions of Learning (DoL) construct. The descriptions were then actively collated into themes using the approach of Braun and Clarke. These themes were checked by team members at several timepoints, and discussed until consensus was reached. The findings were presented in narrative format, together with tables and figures [32].

3. Results

The search identified 2,814 publications. Following the removal of 1,687 duplicates and 1,436 irrelevant records, 241 publications were subjected to full-text screening. Of these, 152 records were excluded, primarily because they had not discussed Learning Principles or digressed from a parent learning focus. This resulted in 89 eligible publications.

3.1. Study characteristics

The included publications originated from 12 countries, USA (n = 40), Australia (n = 20), UK (n = 10), Canada (n = 7), Finland (n = 4), Ireland (n = 2), Greece (n = 2) and Sweden, Germany, NZ and the Netherlands (n = 1 each). The publications encompassed a wide range of health conditions, family situations and parent education strategies. Asthma was the most common health condition involved (n = 16), followed by complex, life-limiting conditions of children, such as leukaemia (n = 14). Parent education strategies were the focus of 14 publications.

Over half of the HPs involved in the included publications were nurses (54/89; 60.7%), followed by 13/89 (14.6%) that were classified as multi-disciplinary HP teams (e.g. doctors, nurses, indigenous health workers, dietitians).

The publications were methodologically diverse, comprising qualitative and quantitative research (n = 20 and n = 19, respectively), discussion papers (n = 17), mixed-method research (n = 11), reviews (n = 9), grounded theory (n = 3) and practice guidelines (n = 10).

Findings indicated that HPs' perceptions of Learning Principles were diverse, (represented by the wide range of terms describing Learning Principles), and were linked to a wide variety of learning theories and objective measures of 'learning', rather than evaluating the use of Learning Principles. Only 44/89 (49%) of the 89 publications included Learning Principles consistent with all five of Marzano et al.'s Dimensions of Learning [17]. These studies are summarised in Table 3 [33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57], [58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77]. Papers that did not include all five dimensions of learning are described in Supplementary Table 2 [78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99], [100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122].

Parents' perspectives of their parent education experiences with HPs, which also helped to indicate HPs' perceptions and use of Learning Principles, were the focus of 21/89 (23.6%) publications, 15 of which used qualitative methods [42,45,48,53,55,59, 60, 61,73,79,98,102,110, 113,115].

Four overarching themes, about HPs' perceptions and their use of Learning Principles, were identified from the data analysis [32]: (1) HPs' divergent conceptualisations of learning, (2) divergent expectations of learning (with themes 1 and 2 aligning with HPs perceptions of Learning Principles) (3) barriers and enablers to using Learning Principles and (4) limited evaluation of learning (with themes 3 and 4 aligning with HPs use of Learning Principles). There was some synergy between perception and use, with HPs' perceptions of Learning Principles also influencing their use.

3.2. Theme 1: divergent conceptualisations of learning

HPs' wide-ranging perceptions were made explicit through the multiplicity of terms used in the descriptions of Learning Principles and the diversity of theories linked to learning, that underpinned parent education practice. Within this theme were sub-themes (1) terminologies and (2) theoretical frameworks.

3.2.1. Different terminologies

The term 'Learning Principles' was only explicitly used in 6/89 (6.7 %) publications in which HPs referred to 'Adult Learning Principles' [59, 71,86,87,93,96]. The association of Learning Principles with adult learning theories is described further in section 3.2.2.

Authors in all publications perceived the need for HPs to identify parental 'learning' requirements to help parents see meaning and relevance to learn. However, authors used multiple terminologies for the types of 'needs', such as 'learning needs' (27/89 30.3%) [43,48,55,56,58,59,62, 65,66,67,69,73,74,76,83,87,90,92,93,96,97,107,112,115,116,119,120],; 'information needs' (11/89: 12.4%)) [48,53,60,78,79,98,100,102,114, 115,120] and 'education needs' (11/89: 12.4%), [36,43,48,55,56,61,92, 94,102,109,116], with some terms used interchangeably.

All publications recognised the importance of parents gaining knowledge, but authors often restricted their descriptions to the term 'information', with few clarifying the difference between 'information giving' and the subsequent need for parents to process, organise and recall the information to gain knowledge. Conversely, Archibald and Scott [78] used the term 'information needs', to clearly describe parents' 'knowledge mobilisation', confidence, vigilance, capability in medication administration techniques and long-term prevention strategies required for effective care following face-to-face asthma education, yet made no mention of the concept of Learning Principles, which they had implicitly described. A number of the authors of publications who did not use Learning Principles aligning with the Dimensions of Learning did not

Table 3. Descriptive information summary of papers using Learning Principles (LP) aligning with Dimensions of Learning.

| Author/year/country | Aim, design, sample size, duration | Health professional | DoL1-5 | | | Theory/construct/model | Examples of Learning Principles: DoL1: perception, attitude to learning; DoL2: Acquire, integrate knowledge; DoL3: extend, refine knowledge; DoL4: apply knowledge meaningfully; DoL5: tasks become regular part of life, develop autonomy. Barriers are to HPs use of LPs. |
			a	b	c		
Australian Confederation of Paediatric and Child Health Nurses 2016 [33] (Australia)	Standards of Practice for Children's and Young People's Nurses (CYPN): Purpose: To provide minimum standards, framework to 1) inform practice 2) enable practice review 3) support curriculum development and assessment. Design: practice standard Sample: N/A Duration: N/A	Children's nurse	✓	x	x	Partnership approach	**Terms used for LPs**: education strategies: anticipatory guidance, health promotion activities DoL 1 – Cultural safe environment, multiple approaches, communication, promotes health literacy DoL 2 – Learning, care partnership *(enabler for using LPs)*: plans, goals, health, life changes. HPs liaison, discharge plans DoL 3 – enables family, child, collaborative, interactive educational strategies, facilitate decision making skills DoL 4 – New knowledge and skills helps parents apply strategies, engaged with care, self-management DoL 5 – Increased knowledge, achievable, safe discharge care, lifestyle changes. **Evaluation (of learning)** General evaluation of nurses' practice, not parent learning.
Australian Diabetes Educators Association (ADEA) 2014 [34] (Australia)	ADEA National Standards of Practice Credentialed Diabetes Educators. Purpose: to provide Standards of practice framework to assess clients, improve practice, develop education, use quality assessment programs, peer review. Design: practice standard Sample: N/A Duration: N/A	Diabetes educators	✓ x x			Health belief model	**Terms used for LPs**: Teaching and Learning Principles DoL 1- Aware of culture, physical, social, privacy, safe teaching space, health literacy needs, interpreter used DoL 2 – knowledge of causes, management, metabolic control, growth/development issues. Plans created collaboratively DoL 3 – facilitate self-management skills/capacity, understanding. Follow-up appointments. DoL 4 – HPs evaluate patient/parent learning, problem solving, self-management, decision-making skills, sick day management, blood glucose monitoring (BGL), insulin adjustments, healthy diet. DoL 5 – Long-term behavioural changes: mastery of self-management tasks. **Evaluation of Learning**: data monitoring of client care, less presentations to emergency department, less hospital stay.
Australian Diabetes Educators Association 2015 [35] (Australia)	Role and Scope of practice for credentialed diabetes educators (DE) in Australia Purpose: to provide the standards of best practice – diabetic nurses Design: practice standard Sample size: N/A Duration: N/A	Diabetes educators	✓ x x			Theories: Teaching, Learning, Behaviour Change Chronic Disease	**Terms used for LPs**: learning styles, readiness, self-mastery, changed behaviours. DoL 1 – assess learning needs, readiness, extent of behaviour change. Recognise stress of diagnosis, mental health, psychosocial impacts. DoL 2 – declarative and procedural knowledge: healthy eating, being active, monitoring condition, taking medication, reducing risks, client, family driven learning, guided by DE, set goals: identifying current knowledge, abilities. DoL 3 – build on strategies to manage diabetes, management of diabetes for sport, school, using care plans DoL 4 – develops problem solving skills for diabetes control, masters monitoring, implements care plan. DoL 5 – changed behaviours enabling optimal diabetes care **Evaluation**: How HPs evaluate the effectiveness of pre and post diabetes education.
Australian Health Ministers' Advisory Council (AHMAC) 2011 [36] (Australia)	A National Framework for Family and Child Health Services Purpose: To articulate objectives, vision and principles for universal child and family health services for Australian children, 0–8 years. Design: practice standard Sample: N/A Duration: N/A	Nurses, allied health professionals, Indigenous health workers	✓ x x			none.	**Terms used for LPs**: educational strategies DoL 1 – parent readiness, capacity to learn, identify literacy levels, prior knowledge, assess fatigue, depression, mental health. Negotiate learning partnership *(enabler for using LPs)*:. DoL 2 – facilitate anticipatory guidance, hands-on skills. Declarative, procedural education on feeding, safe sleep, reading to child, nurturing relationships, play, nutrition, oral care, healthy eating, not smoking. DoL 3 – builds on previous and knowledge as child grows, develops. Follow-up scheduled timepoint visits. Drop-in clinics to discuss concerns of parents or any identified by HPs.

Table 3 (*continued*)

Author/year/ country	Aim, design, sample size, duration	Health professional	DoL1-5			Theory/ construct/model	Examples of Learning Principles: DoL1: perception, attitude to learning; DoL2: Acquire, integrate knowledge; DoL3: extend, refine knowledge; DoL4: apply knowledge meaningfully; DoL5: tasks become regular part of life, develop autonomy. Barriers are to HPs use of LPs.
			a	b	c		
							DoL 4 – Parent can use knowledge gained, adjust, adapt as child changes over time. DoL 5 – Autonomous mastery of care. **Evaluation:** Performance indicators: meet organisational targets, service usage by families. Parent satisfaction measures.
Blunt 2009 [37] (USA)	Supporting Mothers in Recovery: Parenting Classes: Discussion paper: proposed strategy for mothers of babies in Neonatal Intensive care unit (NICU) after birth. Design: Discussion paper Sample size: N/A Duration: N/A	Nurses	✓	✓	x	Social Learning Theory	**Terms used for LPs:** education strategies, willingness to learn, peer learning DoL 1 – NICU mother receptive to help, readiness to learn, PEP in safe place, mother's prior life-experience and mental health status acknowledged. Peer learning: mothers were prior drug users, but learned parenting skills DoL 2 – factual information on caring for baby, shown skills, help learning of baby's cues, practical skills. DoL 3 – practised parenting, coping, dealing with stressors skills with HPs, refined to life-situation and baby. Phone support by nurse. DoL 4 – able to provide care at home. Realise why they need to problem-solve, not revert to prior drug habits. Peer mentors. DoL 5– lifestyle change is not only learning parenting skills but changing drug use behaviour. **Evaluation:** Identified as 'needed' Barriers: stress of situation, mental health of mothers, previous life experiences
Bonner et al. 2002 [38] (USA)	Identify if Asthma Self- regulation (ASR) education intervention improved parent knowledge, management and adherence to treatments of their child's asthma. Design: RCT Sample size: (n = 100) Duration: 3 months	Allied Health	✓	✓	✓	Readiness to learn. Self-regulation	**Terms used for LPs:** Learning sequence, coaching DoL 1 – readiness to learn, change attitudes, cultural beliefs to see Dr only if asthma severe. Used interpreters DoL 2 – identified needs, declarative and procedural knowledge, ASR model DoL 3 – use of diary, build parent skills to talk to Dr. Care plan when to treat and seek medical help. Phone support. DoL 4 – proactive in adjusting asthma medications, confident to actively interact with GP. DoL 5 – changed behaviours, more pro-active in management, symptom recognition **Evaluation:** success-decrease in symptoms, changes in medication use, confidence. Barriers: cultural beliefs variance, language differences.
Burkhart et al. 2007 [39] (USA)	Test educational intervention (school) by asthma education nurse (AEN) and contingency management protocol effect on parents' asthma management of their child. Design: RCT Sample size (n = 77; 38 controls, 39 intervention group [IG]) Duration: 16 weeks	Asthma nurse	✓	✓	✓	Cognitive, Social Learning Theory	**Terms used for LPs:** teaching, observing, practising, self-managing DoL 1 – safe learning environment for child & parents (school) DoL 2 – multi-modal explanations, demonstrations. Nurses also visited at home DoL 3 – symptom diary use, traffic light analogy in asthma care plan. Phone support, extend knowledge DoL 4 – parents' learning at school session enabled treatments at home: better symptom recognition, used action plans to problem-solve changes in asthma DoL 5 – Changed behaviours: better symptom management. Confidence. **Evaluation:** decrease in disease severity. Asthma QoL scales. No parent knowledge evaluated. Barrier: maintaining motivation of parents for ongoing care
Butz et al. 2005 [40] (USA)	Evaluate home-based asthma symptom education intervention, by asthma community nurse (ACN), targeting symptom identification for parents of children with asthma. Design: RCT (n = 251; 105 control, 105 intervention group	Asthma community nurse.	✓	✓	✓	Model of symptom management	**Terms used for LPs:** only used term teach, 'learn' not mentioned at all, self-management DoL 1 – home visit by ACN, safe environment for parent education, ready to learn DoL 2 – teach declarative and procedural knowledge about asthma, asthma plan, 8 modules, checklist DoL 3 — peak flow monitoring, refining skills and knowledge DoL 4 – problem-solving, decision-making skills used, symptom identification and actions

Table 3 (*continued*)

Author/year/country	Aim, design, sample size, duration	Health professional	DoL1-5 a	b	c	Theory/construct/model	Examples of Learning Principles: DoL1: perception, attitude to learning; DoL2: Acquire, integrate knowledge; DoL3: extend, refine knowledge; DoL4: apply knowledge meaningfully; DoL5: tasks become regular part of life, develop autonomy. Barriers are to HPs use of LPs.
	[IG]) Duration: 6 months						DoL 5 – changed behaviours in longer-term symptom management **Evaluation:** home record visits over 6 months and parent self-report survey of changes
Canino et al. 2007 [41] (USA)	Identify effectiveness of a culturally adapted family-based intervention (CALMA) for reducing asthma morbidity in Puerto-Rican children Design: RCT Sample: (n = 231). Duration: 4 months	Allied Health	✓	✓	✓	none	**Terms used for LPs:** self-management; cultural competence. DoL 1 – home visit, motivation, cultural awareness, safety, used interpreters, readiness to learn DoL 2 – declarative and procedural knowledge about asthma & treatments over 18 days, checklist. DoL 3 – diary use, refining knowledge, skills, asthma care plans: symptom management knowledge DoL 4 - problem solving, decision making, symptom recognition DoL 5 – confidence gained, fewer emergency department visits **Evaluation:** Juniper QoL survey, Caregiver outcome measure, baseline parent interview, repeated 4 months after project start, improved treatment strategies. Barriers: cultural health belief variance, language differences
Cox and Oaks Westbrook 2005 [42] (USA)	To identify and describe family caregiver views of learning chemotherapy home infusion therapy and the nursing actions aiding this learning Design: Grounded theory Sample: (n = 4) Duration: 5 months	Paediatric nurses	✓	✓	✓	Adult Learning Theory Knowles 1984, Bandura Self-efficacy, Swanson's Theory of Caring	**Terms used for LPs:** social and educative process of learning with 4 domains; learning how, what was helpful (context), can I do this? (meaningful), doing it at home myself. DoL 1 – emotional considerations, beliefs, stress of diagnosis, home environment for PEP, readiness to learn DoL 2 – declarative, procedural knowledge and skills for infusion at home, used models, diagrams, equipment DoL 3 – correcting and extending home-management knowledge and skills, phone support. DoL 4 – make care decisions, problem-solving scenarios, revised skills, knowledge DoL 5 – developed confidence, capability to do care at home **Evaluation:** nurse saw parent perform skills repeatedly, correct answers to problem-solving scenarios. Barriers: shock of diagnosis and magnitude of required care, fear of hurting child
Craft-Rosenberg and the American Academy of Nursing Child Family Expert Panel 2002 [43] (USA)	Identification of quality and outcome indicators for Maternal Child Nursing. Purpose: to define core values, concepts, assumptions defining Child Health Nursing for establishing quality and outcome indicators. Design: Discussion paper Sample size: N/A Duration: N/A	Child Health Nurses	✓	x	x	none	**Terms used for LPs:** educational needs DoL 1 – child and parent focused care, culturally safe learning environment. Identify learning needs, caregiving burden recognised DoL 2 – parents counselled; theoretical, practical teaching aligns with identified needs, builds caregiving skills, validate learning with family. DoL 3 – builds on child and family goals. DoL 4 – facilitate parents applying learned skills, build strengths, understanding DoL 5 – encourage changed behaviours that promote optimal outcomes and reduce risk. **Evaluation:** Evaluation of desired outcomes varies for each practice subspecialty
Ersser et al. 2013 [44] (UK)	Evaluate service impact outcomes of nurse-led, social learning theory model for Parent education on child, parent and service-related outcomes for eczema management. Design: Quantitative Sample (n = 257 purposive	Community nurses	✓	✓	✓	Bandura Self-efficacy	**Terms used for LPs:** interactive learning, problem-solving DoL 1 – attitudes towards under-treatment, failure, fear of topical steroids DoL 2 – linking prior knowledge to new. Analogies, volumes, timings of treatments. 3 weekly 2-hour sessions. DoL 3 – eczema care plans. Nurse phone support available to answer questions DoL 4 – on-going decision making in treatment adjustments: when to use steroids, use of moisturisers DoL 5 – developed confidence, capability to treat eczema, maintain moisturiser use.

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Table 3 (*continued*)

Author/year/country	Aim, design, sample size, duration	Health professional	DoL1-5			Theory/construct/model	Examples of Learning Principles: DoL1: perception, attitude to learning; DoL2: Acquire, integrate knowledge; DoL3: extend, refine knowledge; DoL4: apply knowledge meaningfully; DoL5: tasks become regular part of life, develop autonomy. Barriers are to HPs use of LPs.
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	parent/child dyads) Duration: 10 weeks						**Evaluation:** parental self-efficacy of treatment adherence changes; self-reported qualitative parent information on management pre and post-test. Barriers: Topic knowledge and confidence of the nurses
Fowler et al. 2012a [45] (Australia)	Explored Reciprocal learning in partnerships in practice: family home visiting program (FHV) of 10 visits by Child Health Nurses for mothers with depression, compared to didactic model. Design: Qualitative Sample: (n = 3 nurses, n = 3 mothers) Duration: 1 interview.	Child Health nurse	✓	✓	✓	Reciprocal learning in family partnerships	**Terms used for LPs:** shared learning, knowledge enquiry, learning and knowledge development, knowledge production, developing effective parenting solutions DoL 1 – mother's mental health state, joint decision-making, trust, relaxed setting, nurse/parent questions determined learning needs. DoL 2 – individualised learning, learning cues, skills for recognising baby's needs, video-taped session for mother to see, partnership approach *(enabler for using LPs):* DoL 3 – parents supported to develop knowledge and parenting skills further from viewing video, phone support DoL 4 – developed problem-solving and decision-making skills: moved from uncertainty to capability DoL 5 – diverse ways of knowing about their baby, deeper knowledge, changed behaviours **Evaluation:** Qualitative responses of mothers. Barriers: parent mental health issues
Fowler et al. 2012b [46] (Australia)	Co-producing parenting practice: Learning how to do child and family health nursing differently. Design: Discussion paper Sample size: N/A Duration: N/A	Child Health Nurses	✓	✓	x	Reflection-in-action, Reflection-on-action (Schon1983); Reciprocal learning	**Terms used for LPs:** partners in learning and knowledge construction DoL 1 – Parent/nurse establishing shared learning, readiness, health literacy, trust, safe learning environment, mental health state of parents, goal setting DoL 2 – existing knowledge established, built new knowledge about caring for baby in parent classes, health checks or home visits, partnership approach *(enabler for using LPs):*. DoL 3 – nurse helped mother to see issues from perspective of baby and parent to increase understanding, skills, recognise baby cues. Phone support DoL 4 – mothers applied knowledge meaningfully at home and in between visits. Built capacity, confidence DoL 5 – behaviour change, caring became part of daily life, build capacity and capability. **Evaluation:** reported need for evaluation by observing mother and baby interaction. Barriers: nurses changing from didactic approaches for parent education
Furlong et al. 2012 [47] (USA)	Assess cost effectiveness and outcomes of Behavioural and cognitive-behavioural group-based parenting programmes for early-onset conduct problems in children 3–12 years (Only parent skills learning reported here) Design: Systematic Review (n = 1 paper, Martin & Sanders 2003) Duration: 4 months.	Allied Health	✓	✓	✓	Social Learning Theory, operant learning theory	**Terms used for LPs:** Learning 'How and When'. DoL 1 – compelling reason to learn: child's distorted cognitions DoL 2 – declarative and procedural: taught 17 core positive parenting/child behaviour strategies; learned reasons for cognition problems, practical solutions some operant learning involved. Checklist to assess behaviour changes. DoL 3 – building, applying strategies, goal setting, seeing videos, sibling involvement, revising weekly. DoL 4 – increased problem-solving skills, anger management improved DoL 5 – changed behaviours, parents could use strategies learned to apply for child's behaviour in any settings **Evaluation:** self-reporting, parent behaviour scales, child behaviour inventory, parent depression/anxiety scale, problem setting-behaviour checklists for parents' responses. Barriers: mental health, life situations of parents
Furmedge et al. 2013 [48] (Australia)	To gain insight on parents' experiences of learning to administer Clotting factor (CF)	Paediatric nurse	✓	✓	✓	none	**Terms used for LPs:** educational needs DoL 1 – confronting diagnosis, motivation to reduce hospital presentations, parents' anxiety in doing procedures, learning in home environment was

Table 3 (*continued*)

Author/year/ country	Aim, design, sample size, duration	Health professional	DoL1-5 a b c	Theory/ construct/model	Examples of Learning Principles: DoL1: perception, attitude to learning; DoL2: Acquire, integrate knowledge; DoL3: extend, refine knowledge; DoL4: apply knowledge meaningfully; DoL5: tasks become regular part of life, develop autonomy. Barriers are to HPs use of LPs.
	concentrate via their child's Implanted Central Venous Access Device (CVAD): first step in developing educational program. Design: Qualitative Sample: (n = 15) Duration: none stated				important. DoL 2 – goals set, stepped information, practice at each step. Revisited skills until capable. Written, verbal resources. DoL 3 – parents asked questions, revisited skills if parents made errors, phone support. DoL 4 – problem-solving and decision-making, answering scenario-based questions DoL 5 – sense of empowerment, changed lifestyle to recognise treatment requirements. **Evaluation:** parents seen by nurses capably doing procedure in hospital and home, could explain verbally, rationales. Focus Group Barriers: overwhelmed at diagnosis, capabilities needed to manage, fear of hurting child
Grant et al. 2017 [49] (Australia)	National Standards of Practice for Maternal, Child and Family Health Nursing Practice in Australia. Purpose: To provide the role, scope of practice nationally: providing education support, guidance to optimise health, well-being of child. Parent knowledge, understanding, skill building in partnership with family Design: Practice standard Sample size: N/A Duration: N/A	Child Health Nurses	✓ x x	Family theories (un-named)	**Terms used for LPs**: anticipatory guidance, shared partnerships DoL 1 – guided by parents' needs readiness to learn, psychosocial stresses and mental health situations DoL 2 – parents' knowledge, skill development in health and child development, provides anticipatory guidance. Goal setting, support facilitating knowledge development, partnerships in learning *(enabler for using LPs)*: DoL 3 – nurse facilitates increased parents' knowledge, skills to parent safely and effectively, health surveillance and promotion. DoL 4 – knowledge, skills extended, refined through anticipatory guidance and become meaningful to family. DoL 5 – positive, nurturing parent behaviours adopted to optimise health, wellbeing, growth and development, safety of baby/child and parents' mental health and wellbeing. **Evaluation:** Parent feedback, peer evaluation, practice reviews, examines surveillance/health assessment client engagement data.
Greber et al. 2011 [50] (Australia)	Clinical utility of the four-quadrant model of facilitated learning: Perspectives of experienced occupational therapists (OT) Design: Mixed method Sample: (n = 15: n = 7 were OT parents' education) Duration: not stated	Allied Health	✓ ✓ x	Four quadrant Model of Facilitated Learning	**Terms used for LPs**: teaching-learning approach, learning facilitation, client collaboration, learning needs, DoL 1 – readiness to learn, previous learning experiences motivation, learning styles, set learning goals, DoL 2 – planned approach, declarative and procedural, verbal, demonstrated teach-back, skill building, communication between multi-disciplinary teams. DoL 3 – skill development, HP facilitates parents' higher-level cognitive thinking. DoL 4 – task mastery, vicarious learning of parent, problem-solving DoL 5 – master tasks confidently, becomes almost automatic, self-monitoring **Evaluation**: proposed as outcome of seeing parent confidently master tasks with rationales understood. Barriers: lack of a framework to support HPs in how to teach cognitive learning
Horner 2004 [51] (USA)	Pilot study to test effectiveness of school-based asthma education intervention for children with home-based education for parents, to improve asthma Design Quantitative (n = 44) No intervention and control group numbers provided. Duration: 12 months	Asthma nurse (AN)	✓ ✓ ✓	None	**Terms used for LPs**: learning needs, mastery learning, education, information terms used interchangeably DoL 1 – appropriate formats for child and parents, PEP in home setting DoL 2 –- declarative and procedural asthma knowledge, used models. DoL 3 –- development of asthma care plan, which also facilitated dialogue with GP/parent. DoL 4 -– problem-solving and decision-making for medications, use of asthma monitoring devices, asthma plans. DoL 5 – some reference to changed behaviour change **Evaluation**: parent knowledge, learning assumed from parent self-reporting

Table 3 (*continued*)

Author/year/country	Aim, design, sample size, duration	Health professional	DoL1-5			Theory/construct/model	Examples of Learning Principles: DoL1: perception, attitude to learning; DoL2: Acquire, integrate knowledge; DoL3: extend, refine knowledge; DoL4: apply knowledge meaningfully; DoL5: tasks become regular part of life, develop autonomy. Barriers are to HPs use of LPs.
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							and child assessment, parent behaviour scale. Asthma severity by 4 item scale: measured reduced disease severity.
Horodynski et al. 2012 [52] (USA)	Integration of program to promote the development of healthy eating habits at an early age through effective nutrition and parenting education. Design: Qualitative Sample: (n = 628) Duration: 8 weeks	Allied Health	✓	✓	✓	Adult Learning (Norris 2003) Social Cognitive Theory	**Terms used for LPs:** learning, parenting education, applying learning based on 'from telling to teaching' (Norris 2003) DoL 1 – home visits, multi-lingual, culturally safe DoL 2 – knowledge about toddlers' food preparation techniques, previous knowledge about foods, any experiential knowledge DoL 3 – challenges, special requirements toddlers, teeth, nutrition, safety. DoL 4 – set healthy meal goals, parent ability to apply knowledge gained DoL 5 – some self-reported changed behaviour **Evaluation:** No learning assessed, only parent satisfaction survey Barriers: language and cultural health beliefs variation
Jackson et al. 2007 [53] (UK)	Parents' information needs and psychosocial experiences when supporting children with health care needs. Design: qualitative Sample: (n = 10) Duration: not stated	Paediatric nurses	✓	✓	x	none	**Terms used for LPs:** information needs DoL 1 – shared decision-making *(enabler for using LPs)*, fear, readiness, individualised planning and goals DoL 2 – face-to-face approach, written resources to learn facts, practical skills, practice, nurse with sound topic knowledge, organisational resource support DoL 3 – refining skills learned, follow-up face-to face and/or phone HP support DoL 4 – parent can do necessary care, cope with fluctuations confidently DoL 5 – parents care capably for child in variety of environments **Evaluation:** reported needs to be undertaken but not done
Jönsson et al. 2010 [54] (Sweden)	A multi-disciplinary education process related to the discharging of children from hospital when the child has been diagnosed with type 1 diabetes. Design Qualitative Sample: (n = 16). Duration: autumn 2008-Spring 2009.	Multi-disciplinary team (specialist nurse, dietitian, counsellor, psychologist, specialist physician)	✓	✓	✓	Mol's Logic of Care	**Terms used for LPs:** self-care utilisation, family-centred learning, motivation, difference between acquiring and applying knowledge DoL 1 – emotions associated with diagnosis, person centred care focus, mutual trust DoL 2 – teaching & learning process, factual & practical information. Nurse demonstration of skills, checklist. DoL 3 – mastery home management skills, follow-up appointment for skill refinement & further building: confidence DoL 4 – Home leave one night to see how parent managed treatments at home, skills refined if needed, parents' questions arising from home visit answered, relearned if problems or lacked confidence. Home management skills feedback, phone support over time. DoL 5 – autonomous self-care, parents became experts **Evaluation:** no evaluation of outcomes, although parent interviews revealed parents did not agree with nurses' ideas they have 'educated well'. Barriers: shock of diagnosis, magnitude of what parents need to learn, fear, language
Kelo et al. 2013a [55] (Finland)	Pilot educational program to enhance empowering patient education of school-age children with diabetes (parent role aspect discussed) Design: qualitative deductive analysis Sample:(n = 10) Duration: 1 year	Nurses	✓	✓	x	Empowerment	**Terms used for LPs:** learning needs, shared goals, participatory learning, decision making DoL 1 – health literacy, readiness to learn, safe location, identified learning needs, set individual goals DoL 2 – declarative and procedural knowledge on diabetes survival skills, care, teach-back, feedback approach. DoL 3 – revise. extra feedback after practice, revisit skills where needed, DoL 4 – checklist parent progression with survival skills, parents felt capable (empowered) DoL 5 – treatments became part of life, changes in family lifestyle. **Evaluation:** multi-methods: verifying learning outcomes, observing capabilities, problem-solving scenarios, also documented learning that had taken place.

Table 3 (*continued*)

Author/year/ country	Aim, design, sample size, duration	Health professional	DoL1-5			Theory/ construct/model	Examples of Learning Principles: DoL1: perception, attitude to learning; DoL2: Acquire, integrate knowledge; DoL3: extend, refine knowledge; DoL4: apply knowledge meaningfully; DoL5: tasks become regular part of life, develop autonomy. Barriers are to HPs use of LPs.
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							Barriers: parents shock of diagnosis and magnitude of care, HPs using didactic paradigm for teaching.
Kelo et al. 2013b [56] (Finland)	Describe significant patient education sessions, explore nurses' empowering and traditional behaviours in patient education process of children and their families Design: qualitative critical incident technique Sample: (n = 45) Duration: data collection over 2 months	Nurses	✓	✓	x	Empowerment	**Terms used for LPs:** education, learning needs (social, functional, experiential), cognitive and concrete preparation, followed by Interactive learning. DoL 1 – identified parents/patient holistic and multi-modal learning needs, abilities, fears, prior experiences, readiness to learn by observation, notes, interviews and other HPs. DoL 2 – declarative and procedural knowledge on treating/managing condition, needs identified in shared process ((*enabler for using LPs*), demonstrations, multi-modal resources DoL 3 – revise with extra feedback after practice, offered alternatives if not successful DoL 4 – motivated patient/parents during progress and learning, confident and capable DoL 5 – treatments became part of life, changed family life-long coping with treatments. **Evaluation**: by multi-methods for each patient/parent, observation, answering scenario-based questions, asked family also to evaluate their own capability. Barriers: parents shock of diagnosis and magnitude of care, HPs didactic teaching methods
Koopman van der Berg et al. 2001 [57] (The Netherlands)	The **use** of self-efficacy enhancing methods in diabetes education in the Netherlands Design: mixed method Sample: (n = 261) Duration: unclear	Diabetes educators	✓	✓	x	Self-efficacy (Bandura 1977)	**Terms used for LPs**: self-efficacy, knowledge transfer, skills, attitude training, modelling DoL 1 – safe, calm environment for learning, parent goal setting (not seen in study) DoL 2 – declarative and procedural knowledge, small steps, used diagrams, models DoL 3 – build on parents' performance achievements, revisit skills, revise, peer parent learning DoL 4 – verbal persuasion, vicarious experience for parent learning, parents answered scenario-based questions. DoL 5 – parents became confident with diabetes care, implemented lifestyle changes. **Evaluation:** should occur from modelling, but not seen in study.
McCarty and Rogers 2012 [58] (USA)	Describe impact of inpatient evidence-based asthma education program delivered by asthma Nurse practitioner for children with asthma and parents. Goal: Help parents develop knowledge, skills to avoid triggers, recognise symptoms, act for exacerbations. Design: Discussion paper Sample: (n = 156) Study duration: 2 years.	Asthma Nurse Practitioner	✓	✓	✓	none	**Terms used for LPs:** Learning, education needs, styles, teach back, return demonstration DoL 1 – safe, relaxed learning environment in hospital DoL 2 – identify literacy levels, multi-modal resources, interactive teaching sessions, help parents learn about asthma, using models, diagrams of airways, lungs, role of action plans DoL 3 – practised, refine skills, recognise asthma symptoms, check understanding of action plan, adjusted medications. DoL 4 – focus on problem-solving scenarios about asthma symptoms and what to do DoL 5 – confident in using treatments, following care plans became part of family life **Evaluation**: Feedback: after each class, parent satisfaction survey. Survey not included in publication. Parents found teaching and resources useful.
McDonald et al. 2016 [59] (NZ)	Describe the learning process of family/carers needing to learn to manage technical health	Nurses	✓	✓	✓	Knowles' Adult Learning	**Terms used for LPs:** Learning needs, adult learning principles, process of learning, DoL 1 – parents over-whelmed by diagnosis, confused, nurse/parent shared

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	procedures at home (e.g. enteral feeding, cannulation, dialysis, tracheostomy care) Design: Grounded theory Sample: (n = 20) Duration: 19 months					Principles (1984)	role of education, readiness to learn, parents wanted nurse with sound topic knowledge, but some nurses reluctant to trust parent with required care DoL 2 – declarative and procedural knowledge, step by step learning, checklists, ready for home administration, HPs used parent feedback for verification of learning, understanding. DoL 3 – refining knowledge and practising procedures, developing skills for home setting DoL 4 – problem-solving, decision-making when given scenarios DoL 5– added responsibilities accepted over time, developed autonomy in caring, coping. **Evaluation**: parent self-reports, scenario-solving, nurses seeing parents perform procedures capably, eventual partnerships in learning *(enabler for using LPs)*. Barriers: magnitude of condition, challenges, fluctuations in long-term care
McGrath et al. 2007 [60] (Australia)	Learning a new language: informational issues for parents of children treated for acute lymphoblastic leukaemia (ALL). Design: Qualitative Sample: (n = 62) Duration: First year of a 5-year study	Nurses	✓	✓	x	none	**Terms used for LPs:** information needs, educational needs DoL 1 – shock of diagnosis, identify parents' needs, honesty, trust, readiness to learn DoL 2 – factual and practical information in understandable language, multi-modal teaching resources, written resources, small steps DoL 3 – parents provided with rationales for constant treatment changes DoL 4 – nurse asks scenario-based questions, support for parents' additional queries, DoL 5 – treatments accepted as part of life, lifestyle changes, parent masters capability to manage **Evaluation**: none Barriers: HPs use of jargon in explanations/demonstrations.
McMurray et al. 2004 [61] (UK)	Managing controversy through consultation communication and trust around MMR vaccination decisions. Design: Qualitative Sample: (n = 69 parents) Duration: 16 months	General Practitioners	✓	✓	x	none	**Terms used for LPs:** educational needs, ongoing learning process, partners in a learning enterprise DoL 1 – parent anxiety over vaccine side-effects, two-way communication, time to process information, honest approach, parents' view respected, influence of previous experiences DoL 2 – facts about vaccines and diseases, mis-conceptions corrected DoL 3 – follow-up appointment, further concerns, re-assured DoL P4 – parents could reason about impact of vaccination on their child DoL 5 – behaviour change, continue vaccination schedule when previously refusing. **Evaluation**: none Barriers: parents having gained conflicting information from media and friends
Nightingale et al. 2015 [62] (UK)	Parents' learning needs and preferences when sharing management of their child's long-term condition: A systematic review. Design: Systematic Review Sample: (n = 23 studies) Duration: November 2013–January 2014	Nurses	✓	✓	x	none	**Terms for LPs**: learning needs, information needs, different ways to respond to management DoL 1 – timely learning situation, learning needs, health literacy evaluation, stress of diagnosis, condition trajectory, trust in HP knowledge, teaching skills, communication DoL 2 – declarative and procedural knowledge and skills taught in small steps, adjusted to parents needs at time, link to pre-existing knowledge. Nurse must have sound topic knowledge. DoL 3 – revisiting information with parents, checking understanding, skill development, phone support DoL 4 – problem-solving, decision-making skills. Group education sessions, answered scenario-based questions DoL 5 – behaviour changes **Evaluation**: stated as needed, not described nor undertaken

Table 3 (continued)

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							Barriers HPs not identifying parents needs, information overload, inconsistent teaching styles
Panicker 2013 [63] (Ireland)	Nurses' perceptions of parent empowerment in chronic illness Design: Qualitative Sample (n = 14) Duration: not stated	Nurses	✓	✓	x	Empowerment	**Terms for LPs**: education and training DoL 1 – readiness of parent to accept care of child, trust, shared decision-making *(enabler for using LPs):* individualised needs and health literacy issues identified, goal setting. DoL 2 – knowledge, skills to care for child provided by nurses, provide plans, tools for parents to learn. DoL 3 – use of care plans, teach parents to analyse what they need to do. Build confidence. Phone support DoL 4 – parents can apply knowledge and skills meaningfully, solve problems. DoL 5 – behaviour changes, competence in care of child **Evaluation**: none, changes assumed from empowerment
Policicchio et al. 2011 [64] (USA)	Bringing evidence-based continuing National asthma education (NACE) to nurses. Design: quasi-experimental Sample: (n = 34) Duration: 1 day	Nurses	✓	✓	x	Self-efficacy	**Terms for LPs**: teaching, demonstrations, self-observing, self-regulation, achievement DoL 1 – nurses using NACE program enhanced parent learning and increased their own skills, cultural awareness, goal setting. DoL 2 – nurses increased skills in how to provide knowledge, practical skills, care plans, feedback, teach-back. DoL 3 – nurses understood need of parents to refine skills, analyse asthma. DoL 4 – better nurse recognition of parents to be problem solvers, make decisions DoL 5 – changed behaviour of community nurses- improved practice **Evaluation**: only nurse behaviour, confidence. No evaluation of parents' cognitive learning effect/impact
Registered Nurses Association of Ontario, 2012 [65]. (Canada)	Clinical Best Practice Guidelines: Facilitating Client Centred Learning. Purpose: Systematically developed statements to assist practitioners and clients to make decisions about their health care and master knowledge and skills to achieve this. Design: Best Practice Guide Sample size N/A Duration: N/A	Nurses	✓	x	x	Social Constructivism	**Terms used for LPs**: learning needs, LEARNS (Listen, establish, reinforce, strengthen). DoL 1 – cultural considerations, learner needs, values, safe setting, readiness to learn, mental health situation. DoL 2 – links to previous learning, partnership approach nurse is facilitator, *(enabler for using LPs):* DoL 3 – follow-up appointments, client practising with nurse, feedback skills building, client can interact better with HCPs and health system. DoL 4 – self-care skills development, model recognises skill mastery is essential to promoting behaviour change. Problem-solving capabilities. Nurse's involvement declines as client's skills and understanding increase. DoL 5 – Empowerment resulting from applying learning, mastering skills, changed behaviour to become autonomous in their care. **Evaluation**: Optimising client-centred learning.
Registered Nurses Association of Ontario, 2015 [66]. (Canada)	Clinical Best Practice Guidelines: Person and Family Centred Care. Purpose: Provides template on best practice in person and family centred care to assist therapeutic, client directed care. Design: Best Practice Guide Sample size N/A Duration: N/A	Nurses	✓	x	x	Knowledge -to-action, Maslow's Hierarchy of Needs,	**Terms used for LPs**: learning needs, active partnerships, tailoring strategies DoL 1 – identifies, respects clients, parents' personal, cultural, health literacy, life context needs, life circumstances, mental health situation, creates safe environment for goals, client/parent directed. DoL 2 – Interactive learning in partnership with client/parent, identifies existing preferences, knowledge, builds new factual and practical knowledge and skills, nurse/client feedback. Multi-modal resources. DoL 3 – Follow-up on care, gains confidence in decision-making to manage health. DoL 4 – gains confidence, skills and capability., DoL 5 – client/parent empowered to manage health autonomously **Evaluation**: seeing client manage, patient satisfaction surveys, perceptions of care.

Table 3 (*continued*)

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Rowe and Fisher 2010 [67] (Australia)	Development of a universal psycho-educational intervention to prevent common postpartum mental dis-orders in primiparas women. Design: Discussion Paper Sample: N/A Duration: N/A	Nurses	✓	✓	x	What were we thinking model	**Terms used for LPs:** salient and interactive learning needs, role play, DoL 1 – identification of women's mental health, health literacy needs, shared learning DoL 2 – declarative, procedural knowledge 'learning though doing' for baby's needs, cues. DoL 3 – learning to trust their 'instincts' also about their baby DoL 4 – problem-solving techniques practised DoL 5 – changes in behaviours, protective instincts of mothers **Evaluation:** Proposed: nurses to see patients perform interactions and activities with baby (and partner) competently. Barriers: Mental health status and life situations of parents
Sanders and Burke 2014 [68] (Australia)	Hidden Technology of Effective Parent consultation: Guided Participation to promote change. Design: Discussion paper Sample: parents undergoing Triple P Positive Parenting Program: learning and skills Duration: not stated	Practitioners (not clarified).	✓	✓	✓	Guided Participation Model	**Terms used for LPs:** social learning, generalising skills learned to new contexts DoL 1 – readiness to learn, understand objectives of program, safety, health literacy, identify needs of parents, previous learning experiences, life situations, mental health of parents, relevance. DoL 2 – shared learning partnership with practitioner, learn strategies to promote positive family environment (verbal, written, modelling, behaviours), monitor progress DoL 3 – small steps, revisiting what was seen if videoed, or self-evaluated. DoL 4 – help parents develop coping skills for setbacks, resilience and capacity building, develop independent problem-solving skills, transfer learning to new context DoL 5 – Sustains the changes in behaviours, become independent problem-solvers **Evaluation**: evaluate process adopted by practitioners, involves assessment of outcomes of the intervention AND the mechanisms by which they were achieved.
Schroeder and Pridham 2006 [69] (USA)	Explore the effect of Guided Anticipation intervention (IG) on mothers' progress for them to be competent with their pre-term infants in neo-natal intensive care (NICU) compared to standard care teaching [SCT]. Design: RCT Sample: (n = 16, control n = 8, intervention group [IG] n = 8) Duration: 6 weeks	NICU nurses	✓	✓	✓	Guided Participation Model	**Terms used for LPs:** Learning needs, guided participation DoL 1 – needed confidence caring for premature babies, identifying goals, NICU stressful. DoL 2 – IG: HPs used resources to help parents learn cues, act for baby, videoed, watched back-participatory learning. Mother's learning adaptive, 'expectations & intention' and attachment relationship. HPs used checklist. DoL 3 – parents became attuned to needs of baby, mothers' knowledge extended, nurse phone support. DoL 4 - anticipate changes in baby, relationship fostering, problem-solving, more adaptive to baby's needs DoL 5 – parents became confident, capable with caregiving and anticipating baby's needs **Evaluation:** mother's capability in relationship and behavioural aspects. Nurses' teaching process stated as 'discreet'. Barriers: shock of the early birth, situation and fragility of baby.
Seid et al. 2010 [70] (USA)	To test the efficacy of Problem-solving Skills Training (PST) in improving health related Quality of Life of children with persistent asthma, from lower socio-economic status (SES) families. Design: RCT Sample: (n = 211) Standard care vs co-ordinated care and PST	Allied Health	✓	✓	✓	Problem solving technique (Zurilla 1986)	**Terms used for LPs:** problem-solving skills, education DoL 1 – identified parents' fears of asthma, bi-lingual and cultural needs and beliefs, interpreter used DoL 2 – asthma facts, skills, medication management, checklist DoL 3 – trigger and symptom recognition, options for asthma management, plans DoL 4 – evaluated options, problem-solving of asthma scenarios. DoL 5 – reflect, evaluate, some changed behaviours **Evaluation:** Health Related Quality of Life (QoL), reduced disease outcome and less health service use.

Table 3 (*continued*)

Author/year/country	Aim, design, sample size, duration	Health professional	DoL1-5			Theory/construct/model	Examples of Learning Principles: DoL1: perception, attitude to learning; DoL2: Acquire, integrate knowledge; DoL3: extend, refine knowledge; DoL4: apply knowledge meaningfully; DoL5: tasks become regular part of life, develop autonomy. Barriers are to HPs use of LPs.
			a	b	c		
	parents' data. Duration: 9 months						Barriers: High dropout rate in study, language barriers to patient teaching & understanding.
South Australia Health 2015a [71] (Australia)	Partnership for Entering the Pathway of Education (PEPE): A clinical support program for child health nurses (CHN). Handbook: Core skills nurses use in Child and Family Health Encounters: used with resource below. Design: Practice guide Sample: N/A Duration: N/A	Child Health Nurses	✓ x x			Adult Learning Principles; Family Partnership	**Terms used for LPs**: learning pathway. DoL 1 – respect parent/carer as expert of their child. Recognise parenting is a time of stress. Attitudes to learning and parents learning needs vary greatly. Respect. DoL 2 – identify parents' existing knowledge. Build knowledge in partnership with parents. *(enabler for using LPs):* Demonstrate skills DoL 3 – facilitate parents to practise skills, revisit. DoL 4 – help parents' motivation to keep building, applying knowledge, skills. Build parents' confidence to adapt care. DoL 5 – Parents become empowered to care autonomously for their child. **Evaluation:** satisfaction surveys, parents' engagement with services,
South Australia Health 2015b [72] (Australia)	Partnership for Entering the Pathway of Education (PEPE): A clinical support program for CHN Attitudes Knowledge and Skills (1) and (2) Design: Practice guide Purpose: to determine Knowledge, Skills, develop core practice skills, key principles required to attain practice, refine skills as a CHN. Sample size: N/A Duration: N/A	Child Health Nurses	✓ x x			Adult Learning Principles; Family Partnership	**Terms used for LPs**: knowledge building, asking 'exploring questions', DoL 1 - Culturally safe, family focused, nurses recognise parents' mental health state, social, physical issues home visits, clinic and group learning settings. DoL 2 - client-led teaching, nurse builds on client's knowledge, skills goals, care plans, practical demonstrations. DoL 3 – nurse/parent: help parents refine developing skills to care for baby. DoL 4 – partnership in facilitating parents' decision-making, problem-solving skills, parents confident. DoL 5 – empowering, child, parents reaching potential by learning, changed behaviours, parents' confidence, capability in parenting skills developed **Evaluation:** nurse self-evaluation, parents' service utilisation, peer and self-evaluation, parent satisfaction surveys, practice reviews, nurse observation-parent perform skills repeatedly, problem-solving scenarios.
Stevens et al. 2014 [73] (USA)	To explore parent learning experiences to increase understanding of the process parents use in learning to feed their pre-term infant feeding. Design: Phenomenology Sample: (n = 20) Duration: January to May 2010	Nurses	✓ ✓ X			none	**Terms used for LPs:** learning needs, education support, DoL 1 emotions, anxiety, overwhelmed, fearful of baby DoL 2 different learning paces, stepped through factual and practical knowledge, demonstrations, asked questions, formal and informal learning activities practiced. Checklist ensured topics covered, especially for home setting. DoL 3 practiced and refined skills, learned from errors, asked questions, nurses' help in refining parent techniques. Phone support by nurse to answer, clarify parent questions: refine, extend knowledge DoL 4 gained confidence, parents 'felt they had it', felt capable. Could answer scenario-based questions for home care. DoL 5 behaviour change feeding baby, become part of homelife. Parents needed to be capable, confident by discharge. **Evaluation**: implied by observing mothers; not explicitly discussed
Swallow et al. 2009 [74] (UK)	To explore nurses' contribution to families' learning in shared management of childhood chronic kidney disease (CKD) from parents' perspective. Design: Grounded theory Sample: (n = 5) Duration: 2003–2005	Nurses	✓ ✓ ✓			Positioning Theory	**Terms used for LPs:** learning facilitation, teaching strategies DoL 1 - Shared care, overcome feeling of fear, reluctance, assess learning needs. Home environment is best where care takes place but starts in hospital. DoL 2 – opportunities to gain practical and factual knowledge, parent feedback, nurse having sound knowledge. Nurse uses documentation like a checklist. DoL 3 – Nurse documented education provided. Clarified parent questions. If parents reluctant to learn, strategies to meet parents' needs. DoL 4 – problem-solving session, parents became independent learners, answer scenarios, confident, capable. Nurse phone support check learning translates from hospital to home. DoL 5 – child's management became part of daily life as capable, resilient

Table 3 (*continued*)

Author/year/ country	Aim, design, sample size, duration	Health professional	DoL1-5			Theory/ construct/model	Examples of Learning Principles: DoL1: perception, attitude to learning; DoL2: Acquire, integrate knowledge; DoL3: extend, refine knowledge; DoL4: apply knowledge meaningfully; DoL5: tasks become regular part of life, develop autonomy. Barriers are to HPs use of LPs.
			a	b	c		
							carers. **Evaluation**: nurses seeing parents undertaking treatments/ management strategies until capable.
Thompson and Thompson 2014 [75] (Australia)	Help nurses understand the steps in the learning process, in patient education that can facilitate behaviour change in parents caring for children with eczema Design: Discussion paper Sample: N/A Duration: N/A	Nurses	✓	✓	x	Nature of Knowledge and Human Inquiry (Keeves 1997). Three World's view (Popper and Eccles 1997). Bandura Social Cognitive Theory	**Terms used for LPs**: learning process, nature of knowledge, declarative, procedural DoL 1 – establish health literacy levels, learning needs, readiness to learn, cultural safety, goals, fears of topical steroid use DoL 2 – identify factual and practical knowledge using diagrams, models, analogies, stepped skills development, nurse demonstrates treatments, enables parent to practise (procedural knowledge). Reciprocal feedback, written, verbal resources. DoL 3 – answer questions on follow-up appointment/visit. Help patient analyse, see meaning of treatments, understanding of eczema care plans. DoL 4 – Parents develop problem-solving and decision-making skills, can answer scenario-based questions, know rationales for actions. DoL 5 – management is part of daily life, behaviour and lifestyle changes; patients/parents do treatments autonomously. Have sense of capability, confidence, empowerment is an outcome of effective learning process. **Evaluation:** Proposed that nurses to see patients perform procedure competently, answer scenario-based questions
Thompson 2017 [76] (Australia)	Discuss the reason eczema interventions by nurse are successful, with the subsequent development of a theoretical framework to guide nurses to become effective educators. Design: Discussion paper Sample: N/A Duration: N/A	Nurses	✓	✓	x	Nature of Knowledge and Human Inquiry (Keeves 1997). Three World's view (Popper and Eccles 1997), Bandura Social Cognitive Theory	**Terms used for LPs**: Learning needs, nature of knowledge, declarative, procedural DoL 1 – establish health literacy, readiness to learn, goal setting, cultural safety, fears of treatments. DoL 2 – break down knowledge into steps. Use diagrams/analogies for declarative knowledge. Demonstrate treatments, skills, parent to practise skills at each step, revisited until gained capability, written, verbal resources, care plans DoL 3 – answer questions on follow-up appointment/visit. HP helps parents analyse, see meaning to treatments. Better understand care plans. DoL 4 – Patients developing problem solving, decision-making skills, scenario-based learning. DoL 5 – management becomes part of daily life, behaviour, lifestyle changes; patients not anxious, do treatments almost without conscious thinking. Sense of capability, confidence, empowerment outcome of effective learning process. **Evaluation:** Proposed that nurses to see patients competently perform procedure, patients/parents can explain verbally, with rationales.
Wenniger et al. 2000 [77] (Germany)	Describe the Berlin Model of eczema care using Eczema school model (preliminary data) Design: Discussion paper Sample: (n = 63) Duration: 12 months	Multidisciplinary team	✓	✓	✓	Social Cognitive Theory & Health Belief Model	**Terms used for LPs**: knowledge, modelling and positive reinforcement, applying knowledge, monitoring of behaviours, decision-making capacity and confidence DoL 1 – Readiness & motivation to learn, set goals DoL 2 – multi-modal factual and practical information weekly, group sessions, 2-hour sessions for 6 weeks, used analogies. DoL 3 – refining skills, symptom diary, adapting treatments, action plan extends parent' knowledge and symptom recognition DoL 4 – changed context, problem-solving when eczema changed, adjusted treatments. DoL 5 – longer-term behaviour changes to manage eczema with confidence and capability. **Evaluation:** Health related QoL scale, reduction in disease severity, parent coping scale. Barrier: HPs finding balance between parent needs, group delivery, skills development

describe parents' decision-making and problem-solving skills development needed for autonomy in their children's care [79,81,84,88,89,92, 96,99,100,104,115,121].

Only 4/89 (4.5%) publications made clear distinctions between factual (declarative) knowledge and practical (procedural) knowledge [75,76,79,104]. Only Thompson and Thompson [75], Thompson [76] and Archibald et al. [79] explained why this distinction was important for HPs to facilitate parents' knowledge, motivation and skill development. The distinctions between 'how people learn' and the (teaching) activities, were identified only by Thompson and Thompson [75] and Thompson [76] in their descriptions of a framework created to guide HPs' patient education practice.

Descriptions of HPs' teaching activities overshadowed the perceptions and use of Learning Principles within the learning process. Learning styles, learning modes and information presented in language that was easy for parents to understand were explicitly perceived as the most influential aspects of the learning process in 10/89 (11.2%) of publications [50,58,62,68,77,84,99,107,113,121] although this was implied in most publications. Thompson and Thompson [75] and Thompson [76], emphasised that these activities were only part of the complex learning process of extending parents' thinking abilities. Of note was the omission of the term 'learn' and its derivatives by two authors within their publications [40,98].

3.2.2. Theoretical frameworks

A wide variety of theorists were identified in 46/89 (51.7%) publications that attributed parent education learning strategies to a 'theoretical' underpinning, although there was inconsistency between nomenclatures. These theories are detailed within Table 3 and Supplementary Table 2. Most authors referred superficially to 'adult learning', just citing the theorist, with limited explanation of the Learning Principles integrated within their framework. This highlighted HPs' differing perceptions of Learning Principles. The most commonly cited theorist was Knowles and his Adult Learning principles, which was cited in 15/89 (16.9%) publications [42,59,65,67,71,82,84,86,87,90,93,95,96,99, 116]. Reference dates utilised for Knowles' Learning Principles ranged from 1970 to 2011- interestingly, Knowles started with four Learning Principles, with two more added by 1987 [13]. Gilmer et al.'s [93] review of parenthood transition programs identified a lack of theoretical underpinning which they attributed partly to a lack of awareness of the importance of Adult Learning Principles. Ersser et al.'s [89] systematic review on eczema education further highlighted a lack of awareness of how learning is enabled. These authors suggested that the absence of a theoretical underpinning may be the reason few studies achieved the expected behavioural outcome changes. However, they did not make any references to the role Learning Principles play in this process. Burkhart et al. [39] concurred, as a lack of theoretical underpinning prevented generalisation of their results about the influence of parent education in asthma treatment adherence behaviours. Our scoping review identified that those publications reporting successful behaviour changes, a key aspect in the definition of learning, most commonly drew upon Bandura's Social Cognitive theory (sometimes termed Social Learning Theory) [17] and at least one other theoretical construct [42,52,65,67,71,74,75,76,77, 84,87].

3.3. Theme 2: divergent expectations of learning

The differences between the expectations of HPs, parents and organisations in relation to parent learning, and how this influenced HPs' perceptions and use of Learning Principles is described in this theme. One third (30/89:34%) of included publications reported disparities in the expectations of these three groups.

3.3.1. Parents and HPs

Publications reporting that parents desired learning needs differed from those identified by HPs (10/89: 11.2%) were predominantly

publications not using Learning Principles aligning with all five dimensions of learning [79,82,89,94,99,117,122], although three publications did use all five dimensions [57,63,64]. The context of these publications included learning about medication adjustments [57,63,78, 88], treatments required by children with long-term conditions [63,81, 98,116,121] and parenthood transitions [93]. Parents reported in these publications that they were less inclined to engage in the shared learning process if HPs assumed- they knew nothing about their children's condition. Such comments reflect the HPs perhaps not appreciating the importance of parents' attitudes and perceptions to learning, parents need to acquire and integrate new knowledge and parents needing clearly negotiated learning goals to do so. A further example of divergent expectations was the provision of complex, often jargonistic, information by HPs, which caused parents to struggle as they tried to decipher and understand what HPs mentioned about the treatments they needed to undertake for their children.

Differences in the degree of parent involvement in the decision-making processes of parent education strategies were contentious in 8/89 (9%) of publications. Nurses used their own beliefs of perceived learning needs as the basis of the learning process, not those of parents [63,68,84,98,114,116,120,121]. One study did highlight partnerships with parents when information was provided, reflecting a need for shared decision-making and parents having expectations to learn [[98], p. 228]. Interestingly, observation and subsequent interview data from two studies exploring HPs' beliefs about their learning facilitation skills in supporting parent education did not correlate with what HPs' self-reported [57,84].

3.3.2. Organisations and HPs

Stevens et al. [73] determined that not all nurses followed their organisations' best practice requirements for feeding pre-term infants, thus potentially influencing how nurses perceived and used Learning Principles' to help parents learn required skills. Another organisational issue identified by three other studies was that nurses were not consistently documenting the learning components of parent education practice or the resources provided, thus potentially affecting the quality of parent education in children's continuity of care [55,56,83]. This influenced the child's length of hospital stay if parents had not gained the required knowledge and skills to operate autonomously after discharge.

Topic knowledge was deemed an important element of parent education practice. In a discussion about a new shared learning approach, child health nurses, were found to be confident in parent education practice, often using Learning Principles in practice [46]. In contrast, in an evaluation of nurses' retraining of asthma standards, the confidence in parent education practice of hospital-based nurses was shown to be greater than community-based nurses [64]. Likewise, in a study which used dermatology nurses to train community-based nurses to deliver eczema education workshops, the community nurses withdrew from the study, citing lack of expert knowledge as the reason for withdrawal [44].

3.4. Theme 3: barriers and enablers to using learning principles

Barriers and enablers represent factors that impeded or facilitated awareness of and use of Learning Principles in practice and reflect the relationship between HPs' perception and use of Learning Principles. These were reported in 42/89 (47.2%) and 21/89 (23.6%) publications, respectively and are summarised, (–if reported–), in Table 3 or Supplementary Table 2. There were three sub-themes: 1) cultural, 2) psychological and 3) partnerships.

3.4.1. Cultural

There were two distinct cultural elements 1) parent health beliefs and 2) organisational culture.

3.4.1.1. Parent health beliefs. Health beliefs of culturally and linguistically diverse families challenged HPs' use of Learning Principles, especially when the beliefs delayed parents from seeking medical help if their children's health symptoms deteriorated [38,41,54,70,80,82,84,92,96, 104,105,116]. Mis-interpretation of resources used by parents who had difficulty understanding the English language was problematic not only for HPs but also for parents trying to navigate a health system. In fact, education encounters where HPs' practice used interpreters to help understand parents' culturally entrenched health-related beliefs, enabled HPs to use Learning Principles and parents to see meaning in their learning [38,41,48,54,70].

3.4.1.2. Entrenched organisational cultures of learning. The importance of HPs identifying parents' health literacy levels, a socio-cognitive Learning Principle, was mentioned in 24/89 (27%) of publications [33,36,49,58, 59,62,63,65,66,72,76,82,87,92,96,97,99,103,105,107,113,116,119, 121]. However, these authors often omitted to describe any guidance for HPs' practice, once a health literacy issue was identified. This created a barrier to HPs using Learning Principles. Instead, HPs described the use of Health Literacy 'identification tools', attributing problems with learning to poor health literacy [36,49,61,72,92,109,119]. The practice standards published by the South Australian Department of Health [72] provided a weblink to 'low literacy brochures', but no explanation thereafter on how to use Learning Principles in practice. In contrast, the two practice standards published by Registered Nurses Association of Ontario [65,66] described, in some detail, why health literacy was important to learning and how this might be addressed, using Learning Principles.

Another cultural barrier was the organisational requirements for HPs to document teaching activities on checklists to confirm that the activities occurred. This was reported in 10/89 (11.2%) publications [40,41, 42,47,54,59,65,71,72,92]. It was unclear if HPs assumed this demonstrated parent learning or whether it was a form of clinical practice evaluation, although one organisation required checklists to be completed after infant safety education [71]. The authors' analyses reported improvements in clinical outcomes, through the use of these checklists, but as highlighted in Supplementary Table 2, authors' learning facilitation processes missed principles aligning with at least one of the elements of Dimensions of Learning 3, 4 and 5. This was apparent with in three publications who suggested that 'checklists' influenced parent learning to the extent that fewer children with asthma presented to medical care [40,41,70]. Checklists were not included in publications to identify if they contained Learning Principles. This contrasted with authors (6/89; 6.7%), who emphasised that checklists were only an adjunct to practice and not proof of parents' learning and understanding [42,47, 54,59,65,92]. These authors emphasised that it was explanation and demonstration by HPs and parents practising skills that facilitated learning but they did not explicitly mention using Learning Principles.

Four of the 89 (4.5%) publications attributed 'blame' on parents for non-compliance [84,97,100,114]. HPs stated they had imparted the required information using a variety of teaching techniques but reported that parents were 'not taking responsibility' for their children's care. However, the authors of these publications described no Learning Principles and neglected describing aspects of Dimensions of Learning 3, 4 and 5, apparently unaware of the significance of using Learning Principles [15].

3.4.2. Psychological

Parents' emotions, especially fear and anxiety, associated with their child's condition, which was sometimes influenced by previous experiences of the health system, significantly affected the level of information parents could 'take in'. The issue was critical when parents were confronted with caring for a child with a life-limiting condition [48,53, 98,115]. HPs also reported a concern about what parents had understood if education occurred on the day a child was discharged, rather

than commencing from the time of admission [54,59,120]. Another challenge to HPs using Learning Principles in practice was when HPs provided education during emergency department visits, when parent emotions were particularly intense. Furmedge et al. [48] and Wei et al. [119] also highlighted that the emergency department encounter may be the family's only contact with the health system and as such, it presented an important opportunity for learning about evidence-based care.

Parents' mental health issues featured in 17/89 (19.1%) publications, which were perceived as barriers or potential barriers to HPs using Learning Principles in practice. The majority of publications focussed on education, assessment and support for new parents in community settings [35,36,37,44,45,46,47,49,65,66,67,68,71,72,93,99,101]. These parents needed additional considerations, such as HPs being flexible to parents' fluctuating learning needs and providing greater repetition of information that was broken into smaller steps, particularly when learning new parenting skills. Despite these being recognised as critical to learning, these considerations were not explicitly identified as Learning Principles.

3.4.3. Partnerships

A key enabler of HPs using Learning Principles in practice was the partnership/shared care relationships between HPs and parents where parents felt HPs needed to respect that they 'knew most about their own children'. This concept was reported in 29/89 (32.6%) publications [33, 36,42,45,46,49,53,54,55,59,61,62,65,66,67,68,71,72,74,75,76,84,89, 90,101,113,115,117,121]. In particular, child health and paediatric nurses' practice and practice standards were underpinned by this care model which was shown to incorporate learning facilitation and Learning Principles [33,36,45,46,49,62,65,66,68,71,72,74,75]. These authors attributed the partnership, together with clinical judgement and observations, to building parents' confidence and trust in themselves, as they developed skills and capabilities in successful care.

3.5. Theme 4: evaluation of learning

This theme focused on HPs' evaluation of learning in parent education practice and represents implicit use of Learning Principles by HPs. Including parents' perspectives of their learning experiences added supporting evidence, in addition to the accounts of HPs. Findings were grouped into three sub-themes: (1) Learning assumed successful from clinical outcome measures, (2) Health Professionals seeing parents successfully achieve mastery and (3) parent empowerment. Summarised examples of these sub-themes are shown in Table 3 and discussed below.

3.5.1. Learning assumed successful from clinical outcomes

In 14/89 (15.7%) publications involving interventions [39,40,41,51, 70,77,88,89,104,106,118,119] and practice standard requirements [34, 35], authors implied that improvements in clinical outcomes were a suitable proxy measure of successful learning in parent education. Specifically, the authors of these publications concluded that a reduction in disease symptoms and/or emergency department presentations demonstrated effective learning. Other outcome measures which assumed learning was successful were patient/parent self-reporting satisfaction surveys in 12/89 (13.5%) publications [36,49,52,58,66,70,71,72,112, 114,115,120], Quality-of-Life (QOL) Scales in 8/89 (9%) of publications [39,41,44,70,77,89,91,118] and parent behaviour-change surveys in 7/89 (7.9%) of publications [39,44,47,51,77,82,87]. Such reporting measures neglect the significance of HPs using a range of Learning Principles to facilitate an effective learning process. Child Health nurses and diabetes nurses were required to use parent self-reporting satisfaction surveys to fulfil professional development requirements and to identify parents' changes in knowledge, attitudes, skills and behaviour [34,35,71,72]. Yet no further details on how HPs could achieve this were provided.

3.5.2. Health professionals seeing parents successfully achieve mastery

Effective use of using Learning Principles was evident in 6/89 (6.7%) publications which described in detail, how HPs, through subjective, face-to-face encounters in the hospital and/or the home environment, explained and demonstrated what parents needed to learn and observed parents repeatedly practising skills, over time [42,46,48,50,59,69]. Although the term 'Learning Principles' was not used, the alignment with the Dimensions of Learning suggested strongly that Learning Principles had been used [15]. Parents demonstrated their understanding by solving a range of problem-based scenarios and providing rationales for their answers to HPs. Achievements were discussed with the parents to highlight success and identify where improvements could occur. Encouraging reflection by parents underlined the use of Learning Principles [15]. These parents reported that such an approach contributed to them building trust in themselves and helped them understand why ongoing strategies were necessary. These HPs also evaluated their practice approach through parent-reported satisfaction surveys, but recognised the surveys were not an assessment of parent learning.

3.5.3. Parent empowerment

The implementation of Learning Principles was evident in the 16/89 (18%) publications, where HPs explicitly described how parents became 'empowered' [39,41,44,45,48,53,55,56,63] or whereby goals in practice standards were to use an empowerment approach [33,35,36,49,65,66,72]. The term 'empowered' described the techniques HPs used to help parents enhance their management, coping and skill capabilities following educational interventions, with two publications describing empowerment as a concept [55,56,63]. Evaluations were also augmented by HPs watching parents perform the tasks over time until parents were capable and confident.

Anticipatory guidance, where parents, as learners, gained the knowledge, understanding and confidence to anticipate and manage changes in their children's needs [46] was another parent empowerment technique. The practice standards of Child Health nurses require such an approach [36,49,71,72].

Thompson and Thompson [75] and Thompson [76] proposed that parent empowerment may result from HPs optimising patient and parent knowledge and learning when HPs understood the cognitive learning process in their parent education practice. However, no explicit links to the use of Learning Principles was evident.

4. Discussion

This scoping review aimed to identify, describe and map how HPs perceive and use Learning Principles in parent education practice. The challenges encountered from HPs' multiple, divergent interpretations of the learning process, the absence of the term 'Learning Principles' unless linked to adult learning constructs, sometimes incongruent ideas of how learning theories were incorporated into practice and the focus on teaching activities rather than learning gained clarity when Marzano et al.'s [17] Dimensions of Learning construct was used as a 'lens' to help to map HPs' use of Learning Principles in practice.

When describing their parent education practice, most HPs in the included publications recounted cogently, the myriad of pre-cursors to learning, which are the socio-cultural Learning Principles, such as identifying preferred learning styles, presenting information in multiple modalities, accommodating health literacy, and how these were incorporated into practice, supported by robust references. Few authors described any Learning Principles associated with the distinctions between the different types of knowledge, suggesting many HPs may be unaware of the significant role that factual (declarative knowledge) and practical (procedural) knowledge play in parent education and successful learning [15]. We found that HPs struggled to describe how they helped people to learn. This finding supports what Wolf et al. [122] found before they created the term 'health learning capacity'. They described health learning capacity as a complex aspect of learning,

involving learners' understanding, thinking and practical skills development, their anticipatory guidance, problem-solving and autonomy in care [122]. We propose health learning capacity is facilitated when HPs use Learning Principles. This use of Learning Principles should be made explicit to help HPs understand what they do in practice. Following further research, Wolf et al. [122,123] reinforced that poor health literacy on its own cannot be blamed for poor health outcomes. This concept perhaps provides an answer to Howe et al.'s results [97], where the authors were perplexed that parents with 'adequate health literacy' using a didactic approach to parent education mastered fewer diabetes management skills than their 'low health literacy' counterparts who received an interactive, more interpersonal approach. Our findings suggest the interactive, interpersonal approaches involved HPs using a range of Learning Principles, thus helping parents develop knowledge and skills. The studies using didactic approaches involved minimal use of Learning Principles by HPs, relying instead on information giving.

The findings of this review do suggest that many HPs were using Learning Principles in their parent education practice. We therefore propose, that HPs may struggle to articulate in a coherent 'language' how they facilitate people's cognitive learning capacity, and therefore, how they use Learning Principles. This suggestion of a language gap in practice is supported by the work of Laduke [124] who identified that nurses did not have a language to describe interpersonal aspects of patient care. Laduke [124] also determined that the procedural or 'technical' aspects of care were easily expressed and well documented, especially in procedures and guidelines. One explanation of our findings is that 'how people learn' is an interpersonal aspect of parent education practice. The extent to which problems articulating the learning components of parent education practice contribute to the lack of HPs' documentation of parent learning activities described by several authors, also deserves further exploration [55,56,83].

The only time the term Learning Principles was explicitly used, in the included publications, was when it was linked to the concept of adult Learning Principles, mainly Knowles. However, the differing number of Knowles' principles cited and the dates of their publications, suggested confusion with HPs perceptions of Learning Principles, which supports other authors' findings of HPs' uncertainly about learning facilitation and parent education practice [3,6,7]. Interestingly, most publications using adult Learning Principles construct alone, reported less successful outcomes than those using adult Learning Principles combined with constructs that consider people's behaviour patterns and social contexts, such as Social Cognitive Theory [82,86,93,95,96,113,116]. Whilst this may suggest that drawing from multiple theories may have contributed to better practice, HPs did not identify or describe Learning Principles. This corroborates the view of Braungart et al. [7], who stated that HPs' understanding and use of Learning Principles could be lost in complex theories. Although many HPs may be aware of the need for theory to support practice, it may not be evident to some HPs that such theory links to Learning Principles used in educational strategies [11,12]. This noteworthy finding and its significance to patient or parent education outcomes warrants further exploration.

Attempts to evaluate learning in parent education practice, rather than clarifying HPs perceptions and use of Learning Principles, have instead, steered research into developing 'tools', such as the Parent Learning Needs and Preferences Assessment Tool [125] and the asthma learning information hierarchy [79] and tickbox checklists [41,121]. Again, HPs' use of any Learning Principles when using these tools, is implicit or assumed. Again, use of Learning Principles in HPs' parent education practice is overlooked. In contrast, there were authors, using Learning Principles albeit implicitly, who emphatically stated that checklists do not indicate that parents have understood what they have learned or can apply their knowledge later [42,47,54,59,65,92]. These findings support Cleland et al. [126] who posited that medical training must move away from the mentality of tick boxes to assessing HPs' learning facilitation, competence and quality of patient care. Further

research of how HPs evaluate their use of Learning Principles is also needed.

This review also highlighted the tendency of researchers and HPs to assume learning had occurred, as reflected in the use of objective outcome measures, such as disease severity, parent satisfaction and Quality of Life, rather than educational interventions that were often devoid of any explicit assessment of learning. In a world of competing health funding, organisations require objective results, key performance indicators, processes, guidelines and policies [127]. However, as learning is a complex, subjective process, often involving parents, carers and significant others, it must be realised that the evaluation of learning is too complex to capture using objective measures alone [66,122]. In other words, while outcome measures are important, they must not be considered the sole method of evaluating success in learning. Explicit descriptions of how a range of Learning Principles facilitate parents' knowledge and skill development is needed and how to evaluate those can be explored further. According to Braithwaite et al. [128], organisational emphasis on the aforementioned 'proxy' outcome measures of learning may have compounded the problem by diverting busy health professionals away from the core issue of parent learning.

Our review identified a number of elements associated with successful parent learning, whereby HPs had used a range of Learning Principles appropriate to each learner, such as those outlined in Table 1. These included approaches that focused on person-and family-centred care, supported face-to-face interactive teaching, provided explanations and demonstrations that enabled parents to practise and refine skills over time and allowed parents to seize opportunities to ask questions and correct mis-conceptions or errors in techniques [42,44,46,48,50,54,55,56,59,69]. HPs facilitated parents to develop problem-solving skills, master their knowledge and practical skills by answering scenario-based questions and providing rationales for their answers. Key examples were parents who mastered complex procedures to care for children with life-limiting conditions [42,48,55,59,69,74]. The only practice guidelines explicitly incorporating such approaches were the RNAO best practice in client-centred learning guidelines [65]. Although the RNAO learning communication model (LEARNS: Listen, Establish, Adopt, Reinforce, Strengthen) uses Learning Principles, albeit implicitly, it neglects to explicitly explain to nurses and HPs the need for them to recognise and use Learning Principles to enable learners to transform information to knowledge and to use it meaningfully. The publications describing parents' mastery over their children's care requirements represents not only an important element of effective parent education practice, but evidence that HPs had used Learning Principles. Authors used terms such as 'empowered' parents. From the descriptions in the publications, parents became aware of their own thinking, evaluated the effectiveness of their own knowledge and actions, developed capability and confidence to continue with treatments and care, even when 'the going got tough' [42,74,75,76]. Accordingly, empowerment was considered a concept [74], a process [42,63] and/or an outcome of effective learning [75,76].

The findings of this review are not suggesting that HPs do not have the skills to support parents in cognitive learning processes or use Learning Principles. HPs' years of experience with 'what has worked' in their practice, has enabled many to be successful, confident practitioners [129]. We contend that as well as having no language to describe what they do, some HPs may be unaware of how they perceive and use Learning Principles, within the parent education skills they have gained through years of experience. For example, a number of authors, made statements that assumed HPs (or the reader) knew what they were talking about when they described teaching activities but provided minimal explanation to help HPs better understand how people learn [63,95,107,108]. A decade ago, Coster and Norman [[130] p. 525] expressed concern that their review into self-management and educational interventions could not 'disentangle' the effects of multi-component, complex treatment strategies or interventions, although participatory, empowering programs using 'adult-centred

principles' were considered successful for learning self-management. Our findings suggest that greater awareness of the significance of using Learning Principles may help to start to unravel some of the confusions. Our findings also suggest that the principles of teaching and learning are 'tangled up' and possibly unclear, in some HPs' parent education practice and greater clarity through further exploration of Learning Principle perceptions is needed.

The extent to which organisational 'culture' contributes to effective parent education practice cannot be established from this review. However, we identified that some organisational issues, such as completing 'checkboxes' and use of parent-reported satisfaction surveys, impacted on HPs' use of Learning Principles in practice. Practice standards, although implicitly describing Learning Principles, did not appear to guide HPs on how to facilitate parents to convert information into knowledge, use the knowledge and sustain the capabilities. On a positive note, the child health practice standards did mention the significance of anticipatory guidance as a means of helping parents to learn and understand what was needed to be prepared for their children's growth and developmental needs [36,46,49,71,72]. Our review identified that the approach outlined in their standards reflected the use of Learning Principles in practice.

The findings of the review highlight the need for further research to explore HPs' understanding of the constructs that underpin their parent education practice, with a focus on Learning Principles. It also points to a need to look beyond the influence of 'teaching activities', health literacy, modes of learning and learning styles, to explore what parents believe will best facilitate their learning, understanding and skill development, as suggested by Bastable and Gramet [131].

It is clear that, while in many cases HPs are making effective use of Learning Principles in their practice, their understanding and articulation of these principles are lacking. This is exacerbated by the confusion engendered by multiple theories of both learning and teaching making it difficult for the profession to understand just what constitutes best practice. Our findings also support further exploration of how HPs use of Learning Principles in parent education practice impacts parents' experiences of learning.

4.1. Limitations

Although the scoping review followed the iterative, reflexive, transparent and thorough approach, described by the JBI [22] approach, there were some limitations of this review. Firstly, the search strategy was limited to literature published in the English language, so we may have overlooked pertinent publications that could have influenced the conclusions of the review. Secondly, using the Dimensions of Learning as a 'lens' through which to interpret the findings may have inadvertently introduced some degree of bias [15]. Notwithstanding, as this construct has been successfully used in education practice for years, there is merit in it being applied to help categorise our findings [15]. With limited formal explanations in the health literature, and no appraisal of the quality of the publications included in this review, the findings cannot be interpreted as representing all HPs involved with parent education.

5. Conclusion

To our knowledge, this is the first review to look at how HPs perceive and use Learning Principles in parent education practice. This then highlighted how HPs evaluate cognitive learning. Learning is a subjective, inherently complex construct with diverse interpretations and descriptive terminologies to both educators and learners [131]. We have shown that this complexity extends to the Learning Principles, which should fundamentally underpin parents' learning during the provision of parent education [7]. The review suggests that some HPs' parent education practice was guided by Learning Principles, but there appears to be a gap in HPs' perceptions and understanding of 'how people learn'. Additionally, HPs appeared to have difficulty in articulating how they

facilitate cognitive learning, which also represents their use of Learning Principles. Further work is now required to explore HPs' perceptions and understanding of Learning Principles and how they use these to help people learn. It is also critical that parents' learning experiences of their parent education encounters with HPs be explored. It is critical that the findings of this work be disseminated to health educators and HPs to help guide the provision of cognitive learning in parent education practice. This is especially important, as improving parental knowledge and skill development, and applying these Learning Principles in practice have been identified as essential to helping parents optimise care of their children.

Declarations

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