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## REVIEW ARTICLE

# Association between knowledge of child development and parenting: A Systematic Review

Shiron Jade September\*, Edna Rich and Nicolette Roman

*Robert Sobukwe Road, University of the Western Cape, Bellville, Cape Town, South Africa*

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### Abstract:

#### Background

Parents who understand early child development are better informed on how to respond to children's needs. They are also in a better position to identify developmental delays as opposed to a parent with less knowledge of child development.

#### Objective

The aim of the review was to systematically appraise quantitative studies to establish the association between knowledge of child development and parenting styles.

#### Methods

A comprehensive search, through databases namely: Ebscohost (Academic search complete, Africa-Wide information, PsychArticles, SocIndex, Cinahl), JStor, Sciencedirect, Springerlink, Pubmed and Sage was conducted in August 2014 for the previous 12 years. The methodological quality of the studies were independently evaluated and reviewed by two reviewers.

#### Results

The findings indicate that there is an association between knowledge of child development and parenting styles. While there is an association it may be more of a moderating factor.

#### Conclusion

Future studies may benefit from using other forms of assessment in conjunction with self report assessments.

**Keywords:** Knowledge of child development, Parental knowledge, Early childhood, Parenting styles, Parenting, Systematic review.

## BACKGROUND

The family environment is the primary setting in which a child's development will either thrive or be delayed. Parents, who understand normal child development, are less likely to be abusive and more likely to nurture their children's healthy development. The strongest risk factor contributing to the development of behavioural and emotional problems in children is the quality of parenting a child receives [1]. The quality of parenting is influential as it occurs during early childhood as stimulation is thought to have a special influence on early brain organization and on skill development [2]. A study conducted by Stright, Gallagher and Kelley [3] found that children who experienced a high quality parenting style during infancy and early childhood were more likely to have higher academic competence, better social skills, and better relationships with teachers and peers than children experiencing poorer quality parenting. Similarly, Jackson and Schemes [4] found that preschool children who have warm, supportive; and less authoritarian parents that provide cognitive stimulation, showed better cognitive and language abilities.

\* Address correspondence to this author at the Robert Sobukwe Road, University of the Western Cape, Bellville, Cape Town, South Africa; Tel: +27 21 959 2970; E-mails: [shironseptember@gmail.com](mailto:shironseptember@gmail.com), [nroman@uwc.ac.za](mailto:nroman@uwc.ac.za)

Parenting style is defined as “the manner in which parents treat, communicate with, discipline, monitor, and support their children” [5]. Darling and Steinberg [6] posit that parenting styles moderate the relationship between parenting practices and developmental outcomes. Furthermore Darling and Steinberg [6] state that parenting style represents a constellation of attitudes towards the child that “taken together, create an emotional climate in which the parent’s behaviours are expressed”. Whilst parenting practices are directed toward the behaviour of the child, parenting style convey the parents’ attitude toward the child which can be denoted in the parents’ tone of voice or body language amongst other things [7]. A responsive parenting style allows children to feel safe in exploring their environment and in signalling their interests and needs. In addition responsive parenting provided consistently across early childhood establishes a solid foundation that is hypothesized to place children on a positive developmental trajectory that sustains beyond this developmental period [2]. Although parenting style is a contributing factor, parent knowledge of child development has also often been related to child development outcomes [1].

Maternal cognition plays a pivotal role in parenting and child development [8]. An increase in the study of maternal cognition, which encompasses: maternal beliefs, goals, values, attitudes and knowledge of child development [9] provide a framework for understanding parental actions and the process of child development [10]. Whilst there are various dimensions of parent cognition, knowledge of child development, however, is the most important [8].

The term parental knowledge or knowledge of child development can be defined as understanding the developmental norms and milestones, processes of child development, and familiarity with care-giving skills [8]. Similarly, Bornstein [11] describes parental knowledge of child development as the parents’ cognitions about how to facilitate the biological, physical, social and emotional needs of the developing child; the parents’ understanding of normative child development and the parents’ awareness regarding children’s health. A study conducted by Zand *et al.* [12] attest to the positive relationship between parental knowledge of child development and early childhood outcomes. Parents that are more knowledgeable have more realistic expectations of themselves and their children, and they are more likely to behave in developmentally appropriate ways with their children [13]. When a mother is knowledgeable about child development she would most likely interact more sensitively to her child, which could promote and support healthy social and cognitive development. Similarly, Smith [14] found that mothers with more knowledge of child development tend to use fewer love withdrawal and power assertive discipline strategies and use inductive reasoning. Conversely, a mother who is less knowledgeable of child development may have unrealistic expectations and adopt harsh and inconsistent discipline resulting in poor child developmental outcomes. Furthermore, mothers with unrealistic and distorted expectations are more likely to use severe discipline or abuse compared to their more knowledgeable counterparts [14].

Mothers who are able to accurately judge their children’s abilities construct appropriate learning environments and interact with their children with better sensitivity [8]. Sensitivity refers to the affective quality of the emotional relationship between parent and child focusing on the mother’s accessibility and ability to respond to her child [15]. Furthermore it is also the primary means through which care-giving quality is expressed and relates to the quality of attachment between parent and child [16]. The child’s development of social and cognitive skills is thus influenced by the quality of interaction between child and caregiver. Parent-child interactions are particularly important during early years and the support provided by the parent in the child’s learning experiences allows for the more efficient development of skills. This interaction between parent and child centres on parenting which include discipline and control that form part of the strategies that are used to build socio-emotional and cognitive competence in children [17].

In general there are few studies relating to knowledge of child development and other skills such as parenting styles [1]. Previous research indicates that a relationship exists between maternal cognition, particularly knowledge of child development, and parenting styles in early child development. The purpose of this systematic review was therefor to review and describe previous research studies to determine the association between knowledge of child development and parenting styles. A further purpose of this systematic review was to critically appraise the methodological quality of previous studies with the view to identify gaps in previous research in order to inform future research.

## **METHODS**

Prior to the start of the systematic review, the authors reached consensus on the terms and definitions to be included in this review (Table 1)

**Table 1. Terms and definitions.**

Terms	Definition
Knowledge of child development	It can be defined as understanding of “developmental norms and milestones, processes of child development, and familiarity with care-giving skills” [8].
Parenting styles	Consists of attitudes about children that parents communicate to their children and the emotional climate in which they are expressed [18].
Parenting	Defined as “the process of developing and utilising the knowledge and skills appropriate to planning for, creating, giving birth to, rearing and/or providing care for offspring” [19].

### Search Strategy

A comprehensive search, through the following databases Ebscohost (Academic search complete, Africa-Wide information, PsychArticles, SocIndex, Cinahl), JStor, Sciencedirect, Springerlink, Pubmed and Sage, was conducted for the period between 2003-2014. After a brief review of available literature which included: knowledge of child development and parenting styles, parent knowledge of child development and parenting styles, maternal knowledge of child development and parenting styles, paternal knowledge of child development and parenting styles, child development knowledge and parenting styles, early childhood development and parenting styles, search terms were constructed and agreed upon by both reviewers. The titles and abstracts were retrieved independently by one researcher (SJS) and then screened by another researcher (NVR) using the same inclusion criteria as below in order to determine eligibility of the studies for inclusion to the review.

### Inclusion Criteria

The criteria for inclusion into the study were: (i) publication in English language; (ii) publication dates between 2003 and 2014; (iii) target population being parents with children; (iv) association between knowledge of child development and parenting or parenting styles. This systematic review included only quantitative and intervention studies to review the instruments used in these studies and to examine the association between knowledge of child development and parenting.

### Methods of the Review

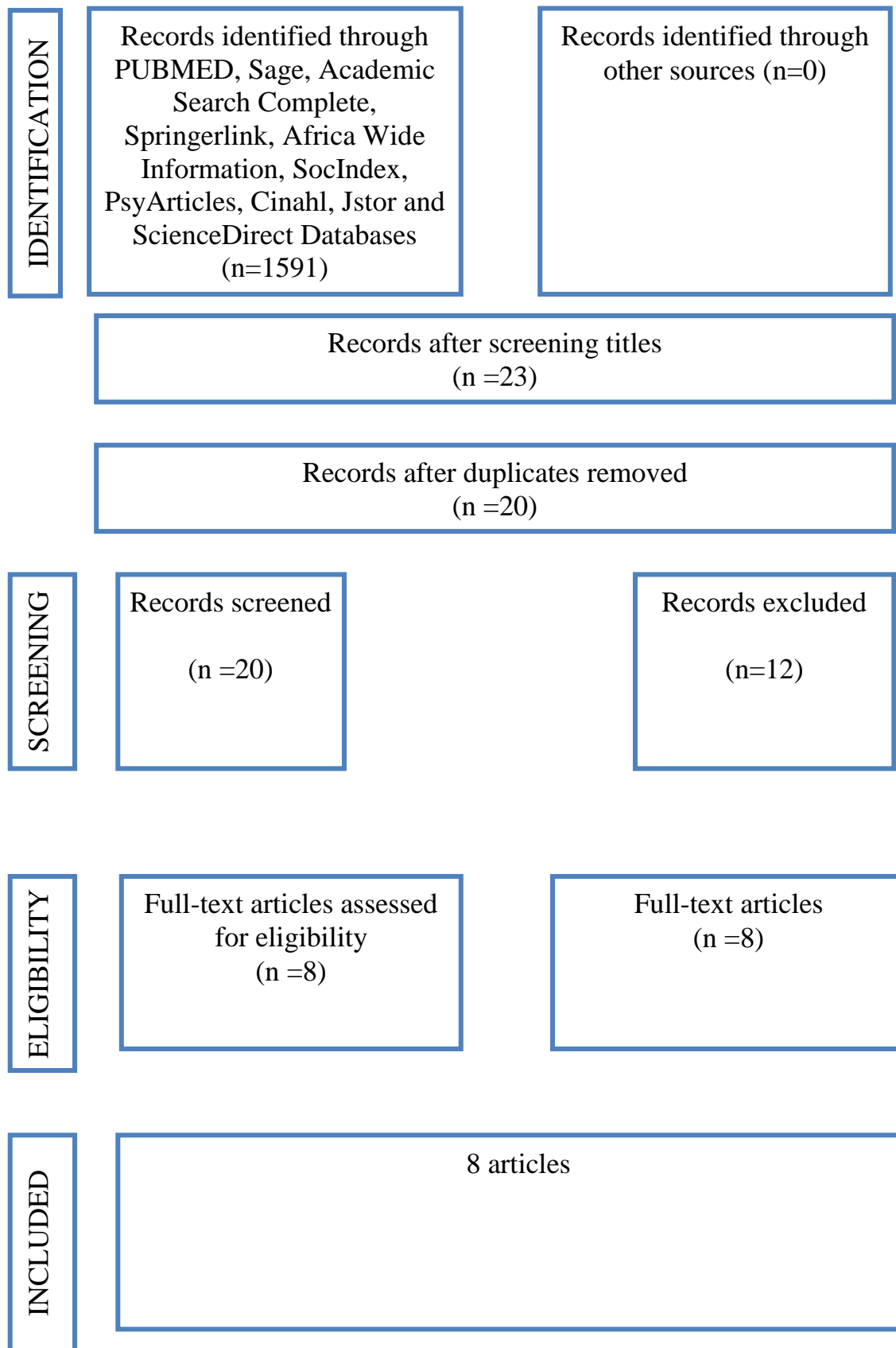
The initial search was conducted by one researcher (SJS) and the titles and abstracts screened by another reviewer (NVR). The initial search on titles yielded a total 1591 - full text articles and abstract - across all the search terms based on the inclusion criteria agreed upon by the researchers. At this point the methodological approach of the studies was not considered as yet. In other words this total comprises of the total number of hits based on the search terms used. Thereafter the articles were screened for eligibility and a sample of 23 records was attained based on the inclusion criteria. At this point the articles were roughly screened based on whether the study was related to the topic of interest. All duplications (N=3) were then removed from the data and a final sample of 20 studies was retrieved. The citations for the 20 articles were read to establish inclusion into the systematic review. After reviewing the 20 retrieved articles 12 were excluded based on the methodology used in the study as only quantitative and intervention studies formed part of the inclusion criteria. The final inclusion sample consisted of eight articles which were based on the methodological quality of the study.

### Methodological Quality Appraisal

A methodological quality assessment tool from previous research [20] was adapted and used to appraise each article (Table 2). Each article was appraised and scored. The total was then converted to percentages as seen in Table 3. The final sample consisted of (8) articles as represented in the process flowchart Fig. (1).

### Data Extraction

The data extraction sheet was designed to identify information pertaining to the author, date of publication, country, population (sample size, age, gender), study design, measuring tool used for data collection, definition of knowledge of child development, definition of parenting/parenting styles and results (Table 4)



**Fig. (1).** Screening of articles included.

**Table 2. The critical appraisal tool.**

1. Was the sampling method representative of the population intended to the study?
  - A. Non-probability sampling (including: purposive, quota, convenience and snowball sampling)
  - B. Probability sampling (including: simple random, systematic, stratified g, cluster, two-stage and multi-stage sampling)
2. How was non – response addressed?
  - A. Reasons for non- response described?
  - B. Reason for non-response not described
3. Did the study report any response rate? (If the reported response rate is below 60%, the question should be answered “No”.)
  - A. No
  - B. Yes
4. Was the measurement tool used valid and reliable
  - A. Yes
  - B. No
5. What was the source of the data
  - A. Secondary source: survey not specifically designed for the purpose
  - B. Primary source
6. Do the authors include the definition of knowledge of child development used for their study?
  - A. Yes
  - B. No
7. Do the authors include the definition of parenting styles used for their study?
  - A. Yes
  - B. No
8. Is the knowledge of child development further explored in the study?
  - A. Yes
  - B. No
9. Is the parenting styles further explored in the study?
  - A. Yes
  - B. No

Scoring method: Total score divided by total number of all applicable items

Grading of the QACO score:

0% -33%	33%- 66%	67% -100%
Bad	Satisfactory	Good

**Table 3. Scoring sheet for the critical appraisal.**

Author	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Score
Arnott & Brown, 2013	0	0	0	1	1	0	1	0	1	33-66%
Winter, Morawska & Sanders, 2011	1	0	0	1	1	0	0	1	1	33-66%
Pevalin, Wade & Brannigan, 2003	1	1	1	0	0	0	0	1	0	33-66%
Morawska & Sanders, 2007	1	1	1	1	1	0	0	1	1	67-100%
Hess, Teti & Hussey-Gardner, 2004	0	0	1	1	1	1	0	1	0	33-66%
Oncu & Unluer, 2012	1	1	1	1	1	0	1	0	0	67-100%
Bornstein & Putnick, 2007	1	0	0	1	1	0	0	1	0	33-66%
Winsler, Madigan & Aquilano, 2005	1	0	0	1	1	0	1	0	1	33-66%

**Table 4. Data extraction table.**

No	Author	Title	Population size	Study design	Country	Defintion of parenting/parenting style and knowledge of child development	Knowledge of child development	Parenting	Measuring tool used to collect data	Relationship between knowledge of child development and parenting/parenting styles
1	Arnott & Brown, 2013	An Exploration of Parenting Behaviours and Attitudes During Early Infancy: Association with Maternal and Infant Characteristics	508 mothers with children under age 12 months	Cross-sectional study	United Kingdom	The parenting style theoretical literature for older children traditionally conceptualizes parenting warmth/nurturing		factor analysis study and found that nurturance and control strongly emerged. Mothers high in nurturance would cuddle their child instead of leaving the child to settle and mothers high in routine would adhere to sticking to strict routine for their baby. Also mothers high on the discipline factor believed that they had to modify their child's behaviour and were not particularly swayed by their infants for e.g. believing that crying was used to manipulated them	Infancy Parenting Styles Questionnaire	Early parenting style was associated with maternal age and education, and infant birth weight, gender and age.
2	Winter, Morawska & Sanders, 2011	The Effect of Behavioral Family Intervention on Knowledge of Effective Parenting Strategies	91 parents 44 mothers and 47 fathers-children between 2-10	intervention study	Queensland		pre intervention parents in the higher socio-economic status group were found to have greater knowledge of child development. However, post parenting intervention parental knowledge and confidence was increased in both low and high socio-economic groups.		SES of parents, the index of relative socioeconomic advantage and disadvantage (based on participant post codes) was obtained from the Australian Bureau of Statistics (2006), Knowledge of Effective Parenting Scale (KEPS; Morawska et al. 2007), The Eyberg Child behavior Inventory (ECBI; Eyberg and Pincus 1999), Parenting Scale (PS; Arnold et al. 1993), The Parenting Tasks Checklist (PTC; Sanders and Woolley 2005)	Relative to baseline, parents in both groups significantly improved their knowledge and confidence, reduced their dysfunction and reported less externalised child behavior. Effect sizes for the latter two variables were similar for both groups, however for parents higher in education the effect for confidence was larger than knowledge. Change in level of dysfunction explained the largest amount of unique variance in change to externalised child behavior.

(Table 6) contd.....

3	Pevalin, Wade & Brannigan, 2003	Parental Assessment of Early Childhood Development: Biological and Social Covariates	8605 children 4696 between 0-23months 3909 between 24-47 months	Population study	Canada			parental depression and hostile parenting were not found to have significant effects contrary to previous findings. Further parental depression suggests an impediment to optimal parenting practices but the models included direct measures of parenting and in their presence the effect of depression became non-significant. Therefore, the effects of depression appear to operate through resultant parenting practices.	The motor and social development scale (MSD) was developed at the US National Center for Health Statistics and designed as a general measure of early child development for use in large, population-based surveys conducted by layinterviewers.	The results suggest that the cumulative effects of a positive family environment begin to occlude the neonatal disadvantages in the first 47 months of life.
4	Morawska & Sanders, 2007	Concurrent predictors of dysfunctional parenting and maternal confidence: implications for parenting interventions	126 families children between 18-36 months	Cross-sectional study	Queensland	Parenting confidence or self-efficacy is generally defined as the perception that one can effectively manage tasks related to parenting (Teti & Gelfand 1991)	do not specifically focus on parental knowledge they do investigate confidence which has been found to be dependent on parental knowledge. The study results showed that parents often did not know what to do when children threw tantrums, that their parenting style affects child behaviour and they also did not know about setting limits	maternal confidence and dysfunctional parenting were interrelated and were also predicted best by parenting variables, in contrast to socio-demographic and child variables. Maternal confidence also mediated the relationships between family income and toddler behaviour. Parenting style and confidence are important modifiable factors to target in parenting interventions	Toddler behaviour was assessed using the Eyberg Child Behaviour Inventory (ECBI; Eyberg & Pincus 1999), The Parenting Scale (PS; Arnold et al. 1993) is a 30-item self-report, Likert-style questionnaire measuring three dysfunctional discipline styles, Toddler Care Questionnaire (TCQ; Gross & Rocissano 1988), The Parental Anger Inventory (PAI; Hansen & Sedlar 1998, The Parent Problem Checklist (PPC; Dadds & Powell 1991), The Relationship Quality Index (RQI; Norton 1983), The Depression Anxiety Stress Scale (Lovibond & Lovibond 1995)	The study found that maternal confidence and dysfunctional parenting were interrelated and were also predicted best by parenting variables, in contrast to socio-demographic and child variables. Maternal confidence also mediated the relationships between family income and toddler behaviour.

(Table 6) contd....

5	Hess, Teti & Hussey-Gardner, 2004	Self-efficacy and parenting of high-risk infants: The moderating role of parent knowledge of infant development	65 mothers	Longitudinal intervention study	Baltimore, USA	Parental self-efficacy is defined as beliefs or judgments about one's competency or ability to be successful in the parenting role	participants scored an average of 82.87% and indicated that the scores were relatively high. Further the study stated that mothers with higher education and income and who were married had greater knowledge than mothers who had lower education, lower income and were unmarried. The study also found that those having greater knowledge of child development were more sensitive to their children. Also the study found that Caucasian mothers had greater knowledge than African American mothers	mothers with higher education, higher income and married were more responsive to their children than less educated, lower income and unmarried mothers. The study found that parent confidence was high but suggests that naively confident mothers may be at risk for parenting difficulties as their children grow into toddlers.	The 10-item Maternal Self-Efficacy Scale (Teti & Gelfand, 1991). Sense of Competence subscale of the Parenting Stress Index (Abidin,1986). Knowledge of Infant Development Inventory (KIDI; MacPhee, 1981)	There were no independent contributions of parental self-efficacy or parent knowledge of development in predicting parenting competence. However, the relation between parental self-efficacy and parenting competence was moderated by parent knowledge of development. By contrast, parental self-efficacy beliefs and parenting competence were inversely associated when knowledge of development was low. Mothers reporting high parental self-efficacy, but low knowledge of development, were the least sensitive with their infants in play interactions, suggesting that these mothers were naively confident about their parenting abilities.
6	Oncu & Unluer, 2012	Parent s' Attitude Towards Their Children Before and After Parental Education	41 parents 18 mother 8 fathers of children between 3-6 years	intervention study	Turkey	According to Darling (1999), parenting consists of complex duties and responsibilities in which mother and/or father has to decide how to organize and guide their son/daughter		mothers were found to restrict father involvement. Subsequently, both mothers and fathers were found to score high in protective and discipline dimensions with fathers scoring higher in these dimensions and being more protective	The Parental Attitude Research Instrument (PARI) was used as a tool for evaluation of parent attitudes before and after the education	Especially there seemed to be a little but, positive effect on the dimensions of protective parenting, and pressure and discipline dimensions
7	Bornstein & Putnick, 2007	Chronological Age, Cognitions, and Practices in European American Mothers: A Multivariate Study of Parenting	262 mothers of 20month old babies	Longitudinal study	USA		degree of knowledge varied according to age and found that older mothers were more knowledgeable than younger mothers. However, the difference was not that significant and stated that there is few empirical evidence to support that maternal age affects knowledge		Self-Perceptions of the Parental Role (SPPR; MacPhee, Benson, & Bullock, 1986). The SPPR draws on social psychological theories of self-esteem (Harter,1983). The Parental Style Questionnaire (PSQ; Bornstein et al., 1996) was constructed to index variation in different	Maternal chronological age appears to be a pervasive factor in parenting. Overall, we found that maternal age per se was related to approximately one half of the diverse maternal cognitions we assessed and to approximately one half of the diverse maternal practices we evaluated, including all categories of parenting



(Table 6) contd....

							and that there may be other factors that influence knowledge apart from SES and education		domains of parenting behavior (see Bornstein,2002). The Parent Attributions Questionnaire (MacPhee, Seybold, & Fritz, n.d.; Sirignano & Lachman, 1985). The Knowledge of Infant Development Inventory (KIDI; MacPhee, 1981)	cognitions (perceptions, reports, attributions, and knowledge) as well as maternal language and emotional interactions. Maternal age was more strongly related to parenting cognitions and practices in younger than in older mothers, however
8	Winsler, Madigan, Aquilano, 2005	Correspondence between maternal and paternal parenting styles in early childhood	56 parents of 28 pre school children	intervention study	USA		reported that pre intervention parents in the higher socio-economic status group were found to have greater knowledge of child development. However, post parenting intervention parental knowledge and confidence was increased in both low and high socio-economic groups	fathers perceived their spouses to be more authoritative followed by permissive whereas mothers perceived their spouses as more authoritative. Further it was found that parents who share similar parenting styles were able to report accurately on their spouses parenting styles. The study concluded that corresponding parenting styles in the same home were important	preschool children independently completed the parenting styles and dimensions questionnaire (PSDQ) [Robinson, C. C., Mandleco, B., Frost Olsen, S., & Hart, C. H. (2001).	Results reveal only modest similarity in parenting styles used by two parents within the same home. Permissive (and to a lesser extent, authoritarian) parenting was somewhat positively associated across parents but no cross-informant association was found for authoritative parenting. Fathers perceive their spouses to be more authoritative, more permissive, and less authoritarian than themselves, whereas mothers only perceive themselves to be more authoritative than fathers. Parents who share similar parenting styles are more accurate at reporting on their spouses' parenting styles than are parents with differing styles. Correspondence in parenting style across both parents in the home is important as are parental perceptions of similarity and differences in styles.

## RESULTS

### General Description of the Studies Reviewed

Of the initial 23 studies only eight studies were included in the review. The reviewers decided that studies scoring 50% and above will be included in the review. Of the eight studies three [21 - 23] scored below average (50%) for the methodological appraisal. Of the nine questions on the critical appraisal tool which was applied to each study to appraise the quality; these studies only answered four questions hence the below average score. Though the studies fell below the average of 50% it still fell within the category of satisfactory to good. Furthermore these studies were included in the review as they contained valid content information pertaining to the research question.

The studies, in the final sample, were one from Turkey [24], three from Canada [22, 25, 26], one from the United Kingdom [21] and three from the United States of America [23, 27, 28]. Data was collected by means of questionnaires in all of the studies. The sample sizes ranged from 41 participants to 8605 participants. The participants in the studies were parents of children of varying ages with the youngest being under 12 months and the oldest 10 years old. Two of the studies were cross-sectional [21, 25], two were longitudinal studies Hess, Teti & Hussey-Gardner, 2004) and three were intervention studies [24, 26, 28]. The final study was a population study [22].

### Defining Knowledge of Child Development and Parenting Approaches

Four of the eight studies provide a definition relating to either parenting or parenting styles. The study of Oncu and Uluer [24] defines parenting as consisting of a complex of duties and responsibilities in which mother and/or father has to decide how to organize and guide their son/daughter. Two of the studies provide a definition which relates to parenting confidence which is defined as the parents' perception that they can effectively manage tasks relating to parenting [25, 27]. The study conducted by Arnott and Brown [21] cites Baumrind [29] in defining parenting styles as traditionally conceptualizing parenting behaviours as individual differences along two dimensions: warmth/nurturance and control. Combinations of these elements categorize parenting style typologies. Neither of the studies included in this review provide a clear definition for knowledge of child development but the content explores the issue of parental knowledge or cognitions of which one of the aspects is knowledge of child development [23, 25 - 27].

### Knowledge of Child Development

Of the eight studies, four studies discuss and explore knowledge of child development [23, 25 - 27]. In the Hess, Teti and Hussey-Gardner [27] study, participants scored an average of 82.87%, which was considered relatively high. Mothers with higher education and income and who were married had increased knowledge when compared to mothers who had lower education, lower income and were unmarried. Furthermore, mothers who had increased knowledge of child development were more sensitive to their children. The study also found that Caucasian mothers had more knowledge of child development than African American mothers. The Bornstein and Putnick [23] study highlighted that the degree of knowledge varied according to age and found that older mothers were more knowledgeable than younger mothers. However, the difference was not significant. Morawska and Sanders [25] add that having knowledge of factors, which correlate to toddler behaviour may facilitate improved understanding of the factors that are important to develop interventions and programmes. While Morawska and Sanders [25] do not specifically focus on parental knowledge they do investigate confidence, which has been found to be dependent on parental knowledge. The study results show that parents often did not know what to do when children threw tantrums; that their parenting style affects child behaviour and they also did not know about setting limits. A later study conducted by Winter, Morawska and Sanders [26] reports that pre-intervention parents in the higher socio-economic status group were found to have greater knowledge of child development. However, post parenting intervention parental knowledge and confidence was increased in both low and high socio-economic groups. The study further suggests that parents in high socio-economic groups would benefit from opportunities to practice their skills and receive feedback whereas the focus for low socio-economic status parents should be on teaching new skills and strategies to improve knowledge and confidence.

### Parenting in ECD

The results of this review found that mothers with higher education, higher income and married were more responsive to their children than less educated, lower income and unmarried mothers. Furthermore, parent confidence was high but naively confident mothers may be at risk for parenting difficulties as their children grow into toddlers [27]. In trying to understand the parenting approaches used in the phase of early childhood development, the studies in this

review show that nurturance and control strongly emerged in this phase of development. For example mothers high in nurturance would cuddle their child instead of leaving the child to settle, mothers high on the discipline believed that they had to modify their child's behaviour and were not particularly swayed by their infants for example believing that crying was used to manipulate them, while mothers high in routine would adhere to sticking to a strict routine for their baby [21]. When these factors are converted into Baumrind's typology of parenting styles they found that mothers high in routine, discipline and low in nurturance could be considered authoritarian, whereas mothers high in nurturance with intermediate levels of routine and discipline may be viewed as authoritative [21].

Furthermore mothers with high anxiety were more likely to seek advice and guidance from others whereas their counterparts were more likely to progress their child and compared the child to others of the same age. Lastly, parenting style was also associated to maternal age and education [21].

Yet another study [25] concluded that maternal confidence and dysfunctional parenting were interrelated and were also predicted best by parenting variables, in contrast to socio-demographic and child variables. Maternal confidence also mediated the relationships between family income and toddler behaviour. Parenting style and confidence are important modifiable factors to target in parenting interventions.

The last study [22] reported that parental depression and hostile parenting were not found to have significant effects contrary to previous findings. Furthermore, parental depression suggests an impediment to optimal parenting practices but the models included direct measures of parenting and in their presence the effect of depression became non-significant. Therefore, the effects of depression appear to operate through resultant parenting practices. Similarly, hostile parenting has been shown to have a deleterious effect on development and the measure used in these analyses had a significant negative effect but was non-significant in the presence of a measure of positive parenting.

The study by Oncu and Unluer [24] reported that mothers were found to restrict father involvement. Subsequently, both mothers and fathers were found to score high in protective and discipline dimensions with fathers scoring higher in these dimensions and being more protective. Similarly, Winsler, Madigan and Aquilano [28] reported that fathers perceived their spouses to be more authoritative followed by permissive whereas mothers perceived their spouses as more authoritative. It was further found that parents who share similar parenting styles were able to report accurately on their spouses parenting styles. The study concluded that corresponding parenting styles in the same home were important.

### **Association Between Knowledge of Child Development and Parenting Approaches**

The study of Winsler, Madigan and Aquilano [28] investigated the differences between maternal and paternal parenting style and found that there was a variance in parenting styles and little agreement between two parents in the same house with a pre-school aged child. The fathers reported that they perceived their spouses to be more authoritative or permissive whereas they perceived themselves to be more authoritarian. Furthermore the study states that it may be that parents perceived that there were greater differences between each others' styles than indicated by self-reported parenting style due to (a) parents' beliefs that traditional parenting stereotypes reflect effective parenting practices and (b) that self-reported parenting style in turn reflects those beliefs. This might suggest that parents' perceptions of others' parenting style is a more accurate indicator of true parenting behaviours compared to self-reported parenting style, and is thus an important question for future researchers. This study however did not explore knowledge of child development in relation to parenting but it explored differences between paternal and maternal parenting styles.

Another study, Oncu & Unluer [24], investigated whether parental attitudes changed after parental education. The results of the study found that parenting education, which increases knowledge, had a positive effect on positive parenting, pressure and discipline dimensions and found that fathers scored higher in protective parenting than the mothers. However this study was conducted with 26 parents and the limitation included that topics discussed on healthy child development were limited, the change effect was small and father participation was not consistent or equal. Three of the studies reviewed [25 - 26] found that maternal confidence and dysfunctional parenting were interrelated and that knowledge of child development was a moderating factor. Winter, Morawska and Sanders [26] found that the effect for confidence was larger than that for knowledge of child development. Two of the studies included in the review [21] [23] concluded that maternal age and education were a pervasive factor in cognition and parenting. However the correlation between parenting and maternal age and cognition was higher for younger mothers as opposed to older mothers [23]. The study of Pevalin, Wade & Brannigan [22] did not directly investigate knowledge of child development but concludes that dysfunctional and hostile parenting has a negative effect on early child development.

The findings suggest that maternal education, positive parenting and social support may counter the negative effect on the child's development process.

### **Measuring Knowledge of Child Development and Parenting**

All the studies reported on the measuring instruments that were used include what the instrument is designed to measure. Two studies used the Knowledge of Infant Development inventory (KIDI) to assess mothers' knowledge of child development, parental practices, health and safety and norms [23, 27]. However Hess, Teti and Hussey-Gardner [27] used only a portion of the KIDI namely the parenting subscale to measure knowledge against parenting. Of the eight studies conducted [21 - 28] several parenting questionnaires were used to measure parental competence, behaviour and style of which three studies used the Parenting Style Dimension Questionnaire (PSDQ) to determine the participant's parenting style category [21, 23, 28]. Another two studies use the Eyberg Child Behavior Inventory (ECBI), which measures parental perception of children's problematic behaviour. Four studies [21, 22, 24, 28] used a single instrument while the remaining four used more than one instrument [23, 25 - 27]. However regardless of which instrument was used the measures reported to have adequate to high internal consistency.

### **DISCUSSION OF THE FINDINGS OF THE REVIEW**

The studies reviewed did not provide clarity on a definition for knowledge of child development and parental knowledge and therefore the results do not clearly reflect that there is an association between knowledge of child development and parenting. There were studies that indicated that there are other factors that influence parenting such as maternal age, maternal education, socio-economic status however, knowledge of child development appears to be a moderating factor [21, 23, 26]. These findings are therefore similar to study conducted by September, Rich and Roman [30] which found that no positive correlation exist between knowledge of child development and parenting instead there were other aspects to consider. Though knowledge of child development is a moderating factor the results indicate that parental education improved knowledge and confidence thus reducing dysfunctional parenting and less externalised behaviour in children [26]. There are different domains or dimensions to parenting such as parenting behaviour, parenting practices, parenting style and parenting confidence [6]. Due to the varying dimensions of parenting with the studies included varying in its focus there is no clear conclusion regarding the association of knowledge of child development and parenting.

This systematic review highlights that there are few research studies which have been conducted on knowledge of child development and parenting. While the review includes cross-sectional studies, longitudinal studies and intervention studies none of these types of studies are without limitations. Cross-sectional studies are conducted at one point in time [31] and the limitation in this is that the time span of the study is not long enough to ascertain whether one variable affects another. Also these studies are conducted on different demographic samples and sizes and generalizability can often not be assumed. There is evidence that childrearing principles and practices change over time and therefore longitudinal studies may be more beneficial. Few studies highlighted that the sample was not necessarily equally distributed or fully representative of the entire population therefore impacting on generalizability considering that there may be other determining factors that play a role when assessing parenting style such as culture, age, socio-economic status and education. Finally most of the studies utilised self-report questionnaires which impact on the information collected as reporting may be on what is perceived by the participant and may not be actual, which may impact on the findings. Perhaps it would be beneficial to use self-reporting instruments in conjunction with observational measures or other forms of assessment.

### **CONCLUSION**

This review highlighted the scarcity in previous research conducted in determining the association of knowledge of child development and parenting styles. The quantitative and intervention studies that were conducted and included in this review did not present clear definitions of knowledge of child development and parenting styles. Furthermore it did not provide concrete evidence of the association between knowledge of child development and parenting styles although the results allude to knowledge being a moderating factor in parenting. Future research studies would benefit from including other forms of assessment in conjunction with self-report measures to gain better insight into the study of parental knowledge and parenting style. In addition, perhaps longitudinal studies with a pre and post study design will provide a better indication of this relationship and the possibility of determining effects between variables.

**CONFLICT OF INTEREST**

The authors confirm that this article content has no conflict of interest.

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