Shared sleep needs and seeking synchrony in parent-infant sleep: A meta-ethnography of parents' perspectives and experiences.

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ABSTRACT

Study Objective

This study sought to generate a comprehensive, multi-dimensional understanding of parent-infant sleep.

Methods

A systematic review, using a meta-ethnographic approach, was conducted to synthesize parents' perspectives and experiences relating to their participation in interactive parent-infant sleep activities in the first two postnatal years with reference to the theoretical construct of co-occupation.

Results

A systematic search was conducted on November 11, 2022 across multiple databases, Embase.com, MEDLINE ALL via Ovid, Web of Science Core Collection, CINAHL via EBSCOhost, and Google Scholar, for English-language studies reporting relevant qualitative data. An exhaustive approach to sampling resulted in the inclusion of 60 multi-disciplinary studies with over 5500 participants. Included studies were appraised for methodological rigor and application of theory. Four themes were generated: shared parent-infant sleep needs; parent-infant sleep synchrony; sleep and the parent-infant relationship; and the impact of socio-cultural context on sleep. The findings are presented as a meta-ethnographic line-of-argument synthesis with a diagrammatic representation.

Conclusion

Parents described parent-infant sleep as a highly interactive experience with the desired outcome of meeting shared parent-infant sleep needs of wellbeing and infant protection. The construct of parent-infant sleep synchrony, supported by the interdependent processes of infant sleep-

consolidation and parent sleep-adaptation, is proposed to represent the degree to which these shared parent-infant sleep needs are met. Bidirectional influences between sleep and the parent-infant relationship are described and the impact of socio-cultural context on sleep is explored.

Keywords

Sleep, infant, parent, co-occupation, postnatal, postpartum

Abbreviations

SIDS: Sudden Infant Death Syndrome

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STATEMENT OF SIGNIFICANCE

This synthesis offers a comprehensive, multi-dimensional understanding of interactive parent-infant sleep based on the perspectives and experiences of parents. While there is growing recognition of bidirectional influences between the sleep of infants and their parents, there is an incomplete understanding of the phenomenon. By applying the theoretical construct of co-occupation, which focuses on interactive parent-infant sleep preparation and sleep participation activities without privileging the sleep of either the parent or the infant, common elements of the shared sleep experience were identified. A proposed definition of parent-infant sleep, the identification of shared parent-infant sleep needs, and the conceptualization of parent-infant sleep synchrony offer novel insights for future research and interventions aimed at improving sleep outcomes for both infants and new parents.

INTRODUCTION

Infant and parent sleep in the first two postnatal years is a primary concern for new parents and healthcare professionals.[1, 2] However, many pediatric and primary care clinicians identify a gap in their knowledge with respect to their understanding of children's and new parents' sleep.[3, 4] A lack of academic consensus on the parameters of normal, optimal, and safe infant sleep presents a barrier to professionals' ability to access consistent and reliable information on infants' and new parents' sleep needs.[5-7] Infant sleep interventions are the subject of continued debate regarding their effectiveness,[8] conflicting philosophies,[9, 10] risk of unintended outcomes,[11, 12] and limited consideration of parents' perspectives.[13] Moreover, interventions aimed at supporting new parents' sleep in the postnatal period often do not address infant sleep as the primary source of the sleep disruption.[14]

While parent and infant sleep have historically been studied in isolation from one another,[7, 15] greater recognition of the interactions between parent and infant sleep patterns,[16] locations,[17] and behaviors[18] has given rise to a growing body of research exploring parent-infant sleep as one interactive phenomenon.[19-21] However, parent-infant sleep has not been categorically defined in the literature and there is a recognized need for further interdisciplinary research of the topic.[15, 22] Researchers have also emphasized the importance of context, given the recognized influence of individual and sociocultural factors on both infant and parent sleep.[18, 23]

The construct of co-occupation from occupational science literature offers a fitting theoretical framework to explore the subjective, interactive, and multi-dimensional aspects of parent-infant

sleep.[24] Co-occupation refers to the subjective experiences of two or more individuals

participating in interactive and responsive activities.[25] The concept was first generated from

applying inter-disciplinary theory to research exploring the highly interdependent occupations of

mothers and their children and emphasizes the active agency of both participants and the

multidimensional influence of context.[25] The occupational category of sleep which includes a

range of sleep preparation and sleep participation activities, listed in Table 1, provides an

additional framework to explore parents' experiences of participating in parent-infant sleep.[26]

For the purpose of this study, we have defined parent-infant sleep as parents' and infants'

experiences of engaging in interactive sleep activities within a shared spatial, temporal, and

social context.

Table 1

Sleep Preparation Activities	Sleep Participation Activities
Engaging in bedtime routines	Taking care of personal sleep needs
Determining sleep and wake times	Sustaining sleep without disruption
Establishing sleep patterns for growth and health	Meeting toileting and hydration needs
Preparing the sleep environment	Negotiating the needs of and interacting with others
Setting up or turning off equipment and electronics	Monitoring the comfort and safety of others who are sleeping

Interactive Sleep Preparation and Sleep Participation Activities [26]

Table 2

SPIDER Search Tool Headings	Elements of Research Question
S – Sample	Parents of infants aged two years or younger
P of I– Phenomenon of Interest	Interactive parent-infant sleep activities
D – Design	Studies with qualitative data collection and analysis methods
E- Evaluation	Reported experiences and perspectives of parents
R- Research Type	Qualitative or mixed methods

SPIDER Search Strategy Tool Headings [31]

As a method of qualitative evidence synthesis developed to produce a higher-level understanding of complex phenomena, meta-ethnography was selected as an appropriate method to meet this study's objective.[27] To our knowledge, there is no published qualitative evidence synthesis to date which sought to generate a comprehensive understanding of the co-occupational parent-infant sleep experience.

This study aims to synthesize the perspectives and experiences of parents from a diverse range of backgrounds to generate a comprehensive understanding of interactive participation in parent-infant sleep activities within the shared relational, temporal, spatial and socio-cultural context.

METHODS

Design

The seven-stage meta-ethnographic process is reported in line with the eMERGe meta-ethnographic guidelines and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).[27-29] The protocol for this study was registered on 13th December 2022 on the PROSPERO international prospective register of systematic reviews (CRD42022380988). [30] Completed PRISMA and eMERGe checklists are included as Table S1 and S2 respectively in the supplementary material file.

Search Strategy

The SPIDER search strategy tool [31] was used to guide the generation of search terms with reference to the research aim (Table 2). An exhaustive search strategy was subsequently developed by an expert subject librarian.[32] The search was developed in Embase.com, optimized for sensitivity, and then translated to other databases. No temporal limits were used. The search was carried out on the 11th November 2022 in the following databases: Embase.com, MEDLINE ALL via Ovid, Web of Science Core Collection, and CINAHL via EBSCOhost. Supplementary backward-citation searching of reference lists and forward-citation searching of included studies using Google Scholar was also conducted. The full search strategy, including terms and syntax, is provided in the supplementary material file (S3).

Study selection

An exhaustive approach to sampling was applied to ensure that all relevant studies were selected to produce a complete and convincing interpretation of a complex, interactive phenomenon.[33]

English language qualitative or mixed-methods studies published in peer-reviewed journals were included if they reported direct quotes from mothers, fathers, or primary caregivers describing their experiences or perspectives relating to engaging in interactive sleep preparation or sleep participation activities with their infants aged 2 years or younger. Relevant studies where the age of the infant was not specified were included if it was evident that the parent was referring to an infant within the age range of 0-2 years (e.g. they referred to the risk of SIDS or described the child as an infant or baby).

Studies where parents' or infants' sleep was explored in isolation were excluded, as were studies that described parent and infant sleep in clinical settings where interactions with the environment, equipment, and staff would complicate the isolation of parent-infant sleep interactions. Grey literature and conference abstracts were excluded due to the anticipated large volume of search results and to ensure a level of quality and rigor.
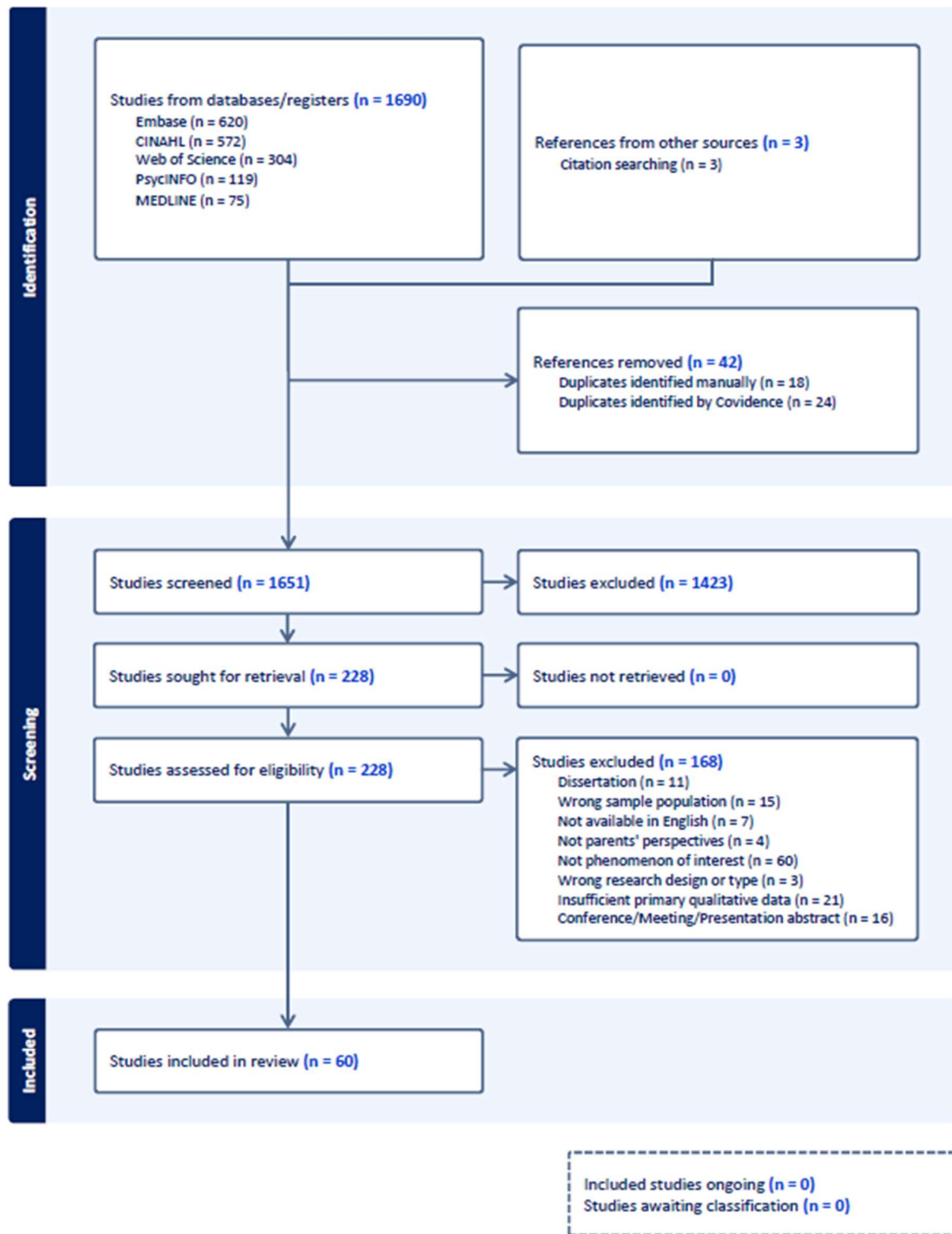
Screening and Data Extraction

Search results were imported to Covidence systematic review software[34] and duplicates were deleted. The first author (PF) independently screened all titles and abstracts for relevance, followed by a full-text screening of all subsequently retrieved articles. The second (DG) and third authors (MS) each independently double-screened 10% of the articles' titles and abstracts and 10% of the full text of the retrieved articles. Where necessary, consensus on inclusion was reached in subsequent discussions between all three authors. Data was extracted to a table of characteristics that included bibliographic information, study aim, location, population, infant age, number of participants, theoretical framework, sampling method, and data collection and

analysis methods (Table 4). For the purpose of populating the table of characteristics, data extracted from five studies that generated findings from the same population of 83 mothers were merged.[35-38] To ensure trustworthiness of this synthesis' findings, contextual data and summary of relevant findings were also extracted for ease of reference at all stages of the research process (Table S4 in the supplementary material file).

All parent quotations (first-order constructs) and original researcher interpretations (second order constructs) relating to interactive parent-infant sleep preparation and participation activities were extracted verbatim to a bespoke MS Word data extraction and coding table (extract included as Table S5 in supplementary material).[39] Both minority and widely held perspectives were extracted in an effort to represent the full breadth and depth of the phenomenon.[27] The first author extracted data from all papers, while the second and third authors each independently extracted data from 20% of the included papers. Decisions were subsequently discussed between all three authors to enhance inter-rater reliability.[40] The PRISMA Flow Diagram outlining the study search and selection process is presented in Figure 1.

Figure 1

Identification

Studies from databases/registers (n = 1690)
- Embase (n = 620)
- CINAHL (n = 572)
- Web of Science (n = 304)
- PsycINFO (n = 119)
- MEDLINE (n = 75)

References from other sources (n = 3)
- Citation searching (n = 3)

References removed (n = 42)
- Duplicates identified manually (n = 18)
- Duplicates identified by Covidence (n = 24)

Screening

Studies screened (n = 1651)

Studies excluded (n = 1423)

Studies sought for retrieval (n = 228)

Studies not retrieved (n = 0)

Studies assessed for eligibility (n = 228)

Studies excluded (n = 168)
- Dissertation (n = 11)
- Wrong sample population (n = 15)
- Not available in English (n = 7)
- Not parents' perspectives (n = 4)
- Not phenomenon of interest (n = 60)
- Wrong research design or type (n = 3)
- Insufficient primary qualitative data (n = 21)
- Conference/Meeting/Presentation abstract (n = 16)

Included

Studies included in review (n = 60)

Included studies ongoing (n = 0)
Studies awaiting classification (n = 0)

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram

Quality Appraisal

Two methods of quality appraisal were used. The *Critical Appraisal Skills Program (CASP) Qualitative Checklist*[41] to appraise methodological rigor and trustworthiness and the *Hierarchy of Evidence for Assessing Qualitative Health Research*[42] to rate the application of theory in the included studies which has particular relevance when conducting a meta-ethnography.[43] The first author independently appraised all included studies and the second and third authors independently appraised two studies each. Covidence software was used to complete, collate and reach consensus on the completed *CASP Checklists*.[34] Appraisal outcomes were subsequently discussed by all three authors to minimize bias, enhance rigor, and reach consensus. Studies were not excluded based on the outcome of the appraisal to avoid the exclusion of parent quotations that had the potential to provide rich insights irrespective of the methodological rigor of the original study.[43, 44] In line with recommended practice in qualitative evidence synthesis, appraisal results were not quantified but sorted into four categories based on consideration of the outcomes of both rating systems.[45] The categories ranged from A to D, where A referred to a high quality paper and D to a low quality paper. In order to privilege data from higher quality studies, coding was first completed on studies that rated as being of high quality (A), followed by those of medium quality (B) in author-alphabetical order to generate the main codebook.[45] Relevant and novel data from studies of medium-low quality (C) were subsequently incorporated into the codebook. In practice, data from studies rated as low quality (D) did not generate new codes but did serve to confirm existing codes.

Data Coding, Analysis, and Synthesis

Manual line-by-line emergent coding was completed by the first author on the entire dataset of first and second order constructs.[46] The second and third author independently coded one study each and similarities and differences in coding were discussed by all three authors at the start of the coding process to minimize bias and enhance consistency in coding. Codes were then sorted into short interpretive summaries of shared meaning, subsequently grouped into sub-themes and finally arranged into overarching thematic groups using an iterative and collaborative process of constant comparison, discussion, and repeated reading of original studies.[47] The over-arching relationships between the themes and subthemes were considered in order to form a *line of argument* synthesis. In meta-ethnography, a *line of argument* synthesis brings together the findings of the included studies to construct a higher-order interpretive framework that reflects the complexity and diversity of the participants' experiences and perspectives.[27] An extract from the Data Analysis and Synthesis Table is included as Table S7 in the supplementary material file.

Researcher Positioning and Reflexivity

The researchers acknowledge the a-priori assumptions underlying the selected research design and guiding theoretical framework applied. While this starting point reveals certain values and judgements, many interpretivist researchers would argue that any research that has an identified purpose reveals a series of value-based choices and assumptions to some extent.[48] At each stage of the research process, the researchers engaged in active reflection and frequent discussions in an attempt to set aside any further assumptions or biases and ensure that all interpretations were grounded in the primary data.[49]

RESULTS

Characteristics of included studies

The Table of Primary Study Characteristics (Table 3) details the wide range of geographical, ethnic, cultural and socio-economic backgrounds of participants; however, almost half of the studies (48%) were conducted in the United States of America. Mixed methods were applied in 5 of the included studies[50-54] and the remaining 55 used qualitative methods only.

Approximately 5,500 parents/primary caregivers participated in the included studies. A number of studies did not specify exact numbers[54, 55] or characteristics of caregivers/infants [52, 56-60]; however, it was estimated that male primary caregivers accounted for between 2-5% of participants. Only data related to direct caregiver involvement in sleep activities with infants aged 2 years or younger were extracted from studies with mixed participant or infant age-group cohorts. While no studies specifically included parents or infants with diagnosed conditions, parents in two studies were described as experiencing symptoms of depression[61, 62], parents in one study rated near or above the 90th percentile on an anger scale[62], the infants in two studies were born preterm[51, 63], and participants in four studies had accessed a service or used an intervention specifically to address infant sleep problems[58, 64-66]. The included studies ranged across a thirty-year period (1992- 2022) and from a wide disciplinary base. The research aims of the included studies all differed from the specific research aim of this synthesis. Of the included studies, 32 were rated as high or medium quality (rated A or B), 21 as medium-low quality (rated C) and 7 as low quality (rated D). Unreported methods, failure to address the risk of bias, and a lack of a guiding theoretical framework were the primary factors leading to a lower

quality rating. The quality appraisal rating given to individual studies is reported in Table 3 and Table S5 in the supplementary material file. Table 4 shows the contribution of each included study to the subthemes and themes.

RESEARCH FINDINGS

This synthesis generated four themes each with a number of subthemes as illustrated in Figure 2.

Figure 2
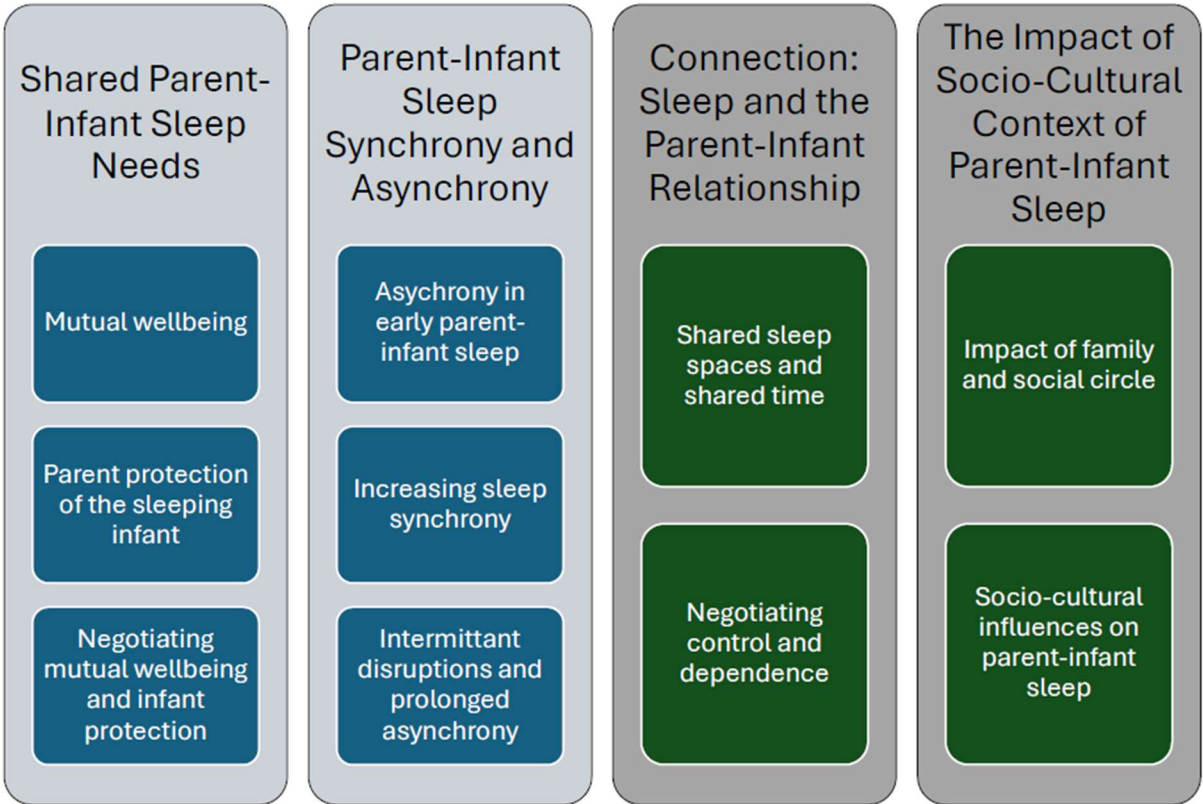
Themes and subthemes

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Theme 1: Shared parent-infant sleep needs: Mutual wellbeing and infant protection

<u>Mutual wellbeing</u>

Parents identified getting enough good quality sleep as important, for both their infant and for themselves, due to the perceived impact of sleep on wellbeing:[51, 61, 62, 64, 67-75] *"... a big concern and it still is, is that he's sleeping you know, not only me."*[67] Parents believed that sleep quality and quantity could influence their infant's general health,[51] behaviour,[64] mood,[64, 69] growth, [51, 75] and level of alertness and feeding.[70] However, many parents described how their efforts to meet their infant's sleep needs often came at the expense of meeting their own sleep needs, with perceived negative consequences for their physical,[37, 61, 67, 71, 72, 76] emotional,[61, 62, 64, 74-77] and cognitive[67, 72, 76] wellbeing. Parents frequently presented their needs as conflicting and distinct from their infant's sleep needs[61, 62, 75, 78], for example, some parents described needing unbroken sleep[37, 67, 71, 72, 74, 79] or personal space[36, 60, 67, 75, 80] at night while infants often required frequent settling, feeding and proximity.[57, 62, 64, 68, 71, 74] Parents nonetheless recognized that the extent to which their own and their infant's sleep needs were met was dependent on the sleep or wakefulness of the other [37, 38, 52, 58, 61, 62, 64, 66-69, 71, 72, 74, 75, 78, 81-84] affirming the interdependence of both their own and their infant's sleep-related wellbeing needs: *"My baby's sleep has... influenced my mood for sure... She did not fall asleep all night, and I am extremely worried about the negative consequences of her lack of sleep on her own health."*[68]

Parent protection of the sleeping infant

Parents expressed the belief that they also held a shared need with their infant to ensure that the sleeping infant was protected from harm: "…*they feel safe, you feel safe knowing that they're all good …*"[80] Parents described feelings of stress,[67] fear,[35-37, 51, 76, 77, 85-89] and anxiety[36, 37, 52, 56, 63, 76, 77, 86, 89, 90] related to the potential risks to their sleeping infant of injury, suffocation, or sudden infant death. To address this concern, many parents slept close to their sleeping infant as they believed this facilitated infant protection during the night.[36, 51, 57, 70, 76, 86, 89, 91-94] Many parents believed that sharing a bed with their infant afforded the best protection, some to the extent that they viewed separate sleep to pose a risk to their infants[36, 87, 92] or to be neglectful of parental responsibility.[76, 86] Some parents perceived their infants to also hold this same need to be feel secure and protected while sleeping[51, 80, 92, 93] which they often related to their infant's desire to sleep in proximity to them.[86, 92, 93] However, another group of parents described feeling reassured that their infants slept well and safely on a separate sleep space,[51, 56, 63, 95] many saying that they avoided or feared bedsharing with their infant as they considered it to be unsafe.[36, 59, 76, 80, 86] Parents who perceived their infants' sleep preferences to conflict with safe sleep guidelines described experiencing shared parent-infant distress when they attempted to comply with the external advice[61, 70, 77]: "*When I put her down in her crib, she would cry and I would cry…*".[70] Irrespective of where they slept, parents described how they themselves felt reassured and were better able to sleep when they believed that their sleeping infant was both safe and felt protected.[51, 80]

Negotiating mutual wellbeing and infant protection:

There were numerous accounts of how parents' attempts to follow infant sleep safety guidelines negatively impacted their infant's ability[37, 52, 84, 96] or their own ability[37, 60, 76, 77, 79] to fall or stay asleep. In some cases, parents' efforts led to feelings of being in conflict with their infant[59, 60, 70]: *"...you're exhausted... not going to fight with this baby to put them in a safe place..."*.[60] While a number of parents said they would never compromise on infant sleep safety,[70, 76, 85] others described knowingly placing their infant in sleep locations, positions, or with bedding that they considered to pose a risk in order to achieve better sleep for either their infant,[52, 60, 87, 97, 98] themselves,[52] or both[37, 52, 76, 77, 79]. Some parents expressed frustration with professional guidance that focused on promoting safe infant sleep but did not extend to offering strategies to promote optimal infant sleep in safe places or positions[52, 60, 76, 79]:

> Some advice or support on how to settle a newborn baby would've been appreciated. But all I was told was to follow the SIDS guidelines and whilst I know this is important, if your baby WILL NOT sleep on their back, what option do you have?'[52]

In addition to efforts to adhere to safe sleep guidelines, parents would often stay awake or wake frequently to monitor their sleeping infant's safety[51, 56, 60, 67, 77, 90]: "*constantly getting out of my sleep trying to look at him, trying to make sure he's okay.*".[60] While some parents believed that they could remain aware of their infant's safety while bedsharing and asleep themselves,[57, 84, 90, 99] others did not share this belief fearing that they might roll onto their baby if they did bedshare.[36, 55, 76, 88, 92] Parents who slept in a separate room frequently used technology to monitor their infants, offering them reassurance that their infant remained safe.[51, 97] However, this strategy did not present a solution for all, with one study finding that the use of infant sleep monitors could conversely increase some parents' anxiety, due to the

frequency of false alarms.[97] While parents' beliefs, values, and practices varied greatly, descriptions of their efforts to support both their own and their infant's sleep-related wellbeing needs while protecting their sleeping infant from harm were consistent across many studies.

Theme 2: Parent-infant sleep synchrony and asynchrony

<u>**Asynchrony in early parent-infant sleep**</u>

Parent and infant sleep patterns were perceived to be highly interactive, described by primary study authors as "*mutually interrelated*",[74] "*reciprocal*",[74] interdependent[61, 83, 100] and sharing a similar rhythm.[57] However, this interactivity did not necessarily translate into a synchronous experience, with many parents describing their infant's sleep pattern as being challenging, [78, 82] "*problematic*", [68] overwhelming,[61, 79] unpredictable,[74, 83] and as conflicting with their own sleep pattern [61, 68, 71, 73, 82, 100] especially in the early postnatal months[61, 68, 74, 82, 100]:

> Their nights and days is mixed up. They don't know when to go to sleep and when to stay awoke, so it's like when they tired, you're not tired. But it's when they woke, that's when you be tired and it's like you can't stay woke while they woke…[61]

While parents could experience this challenge as unexpected[62, 67, 73, 79, 100] and many felt unprepared,[70, 73, 79] other parents with previous experience or who had received information from health professionals about typical infant sleep patterns described a sense of acceptance and being less concerned about their infant's sleep.[68, 73, 101] In the early months, many parents also described a heightened concern for their sleeping infant's safety related to the perceived vulnerability due to their young age,[88, 94, 99] small size,[63, 70, 94] or premature birth.[51, 63] In some cases, parents' protective responses to this anxiety had the potential to negatively

impact their own sleep[51, 60]: "*When he was initially discharged someone (myself or my husband) would stay up with him to monitor him while he slept… Looking back, mainly it was made out of fear...*"[51] For most parents, the early postnatal months were a period of parent-infant sleep asynchrony where meeting the shared sleep needs of mutual sleep-related wellbeing and infant protection was particularly challenging.

Increasing sleep synchrony: Infant sleep-consolidation and parent sleep-adaptation

Following the early postnatal months, most parents found that their infants began to sleep for longer and for more predictable periods and the frequency of infant night wakings reduced.[61, 68, 74, 80, 82, 83] The majority of parents experienced an associated improvement in the quality and quantity of their own sleep and consequently in their own sense of wellbeing[61, 74, 83]:

"*...After 2 or 3 months, my baby started to sleep for longer. Now I feel more comfortable since I can really sleep*".[74] This increasing ability to meet both their own and their infant's sleep needs was not a sole function of the infant's sleep-consolidation process but was also supported by parents' own parallel process of sleep-adaptation.[53, 67, 73, 100] Some parents described physiological changes in their sleep requirements [100]; behavioural adaptation of their own sleep timing (taking daytime naps for example)[67, 84, 100, 102]; or cognitive reframing of their conceptualization of good sleep[73, 84] which involved relinquishing beliefs such as "*...the only kind of good sleep was un-broken sleep and quite a lot of it*."[73] These dual processes of infant sleep-consolidation and parent sleep-adaptation contributed to most parents being increasingly able to meet their own and their infant's sleep needs with time[61, 67, 74, 84]:

> …Sleeping hours increased a little, and my baby finally started to sleep for 4 hours at a time, so I could also take a nap for about 2 hours... Before that, I nearly had a mental breakdown…Now I feel more comfortable since I can really sleep.[74]

In addition to increasingly meeting mutual sleep needs, parents also described a growing confidence in their ability to ensure their sleeping infant's safety as they perceived their infant to grow stronger and less vulnerable with age[70, 88]: *"You know the more time passes, the more confidence you'll feel. The anxiety gets less and the confidence gets more. Plus with her getting bigger and sturdier, that helps a lot."*[70] As the interactive processes of infant sleep-consolidation and parent sleep-adaptation progressed, many parents described a more synchronous parent-infant sleep experience where they were better able to meet their own and their infant's sleep-related wellbeing and infant protection needs.

Intermittent disruptions and prolonged asynchrony in parent-infant sleep

While the majority of parents experienced increasing parent-infant sleep synchrony with time[61, 67, 74] intermittent disruptions to both infants' and parents' sleep were common due to episodic infant health or maturation events such as teething, developmental leaps, or brief illnesses.[65, 74] In addition, a minority of parents experienced difficulties in meeting their own and their infant's sleep needs beyond the early months[61, 74, 84]: *"...you think that...you would get more sleep now that he getting older, I'm getting less, less sleep...".*[61] Some of these parents identified how enduring infant health issues such as reflux, colic, eczema, digestive discomfort, or breathing issues could lead to a more prolonged interruption to the infant sleep-consolidation process.[52, 68, 71, 73, 79] Factors individual to parents were also described as having the potential to act as a barrier to the parent sleep-adaptation process.[61, 83] Low mood,[61], anxiety,[83], on-going daily stressors,[61] negative feelings towards their infant or lives in general,[61, 74, 83] difficulties establishing a routine with their infant[61] and a lack of

support[61, 84] were all identified as having the potential to interrupt parents' ability to meet both their own and their infant's sleep needs beyond the early months.

Theme 3: Connection: sleep and the parent-infant relationship

Shared sleep spaces and shared time

Lying close to, holding, or watching their sleeping infant was frequently described as deeply pleasurable and comforting to parents,[59, 86, 92] with some feeling lonely or incomplete if sleeping separately[36, 54, 92] or that it was wrong or unnatural for their infant to sleep alone.[59, 70, 79, 80, 103] Infants were also considered by parents to have a reciprocal enjoyment of sleeping close to them.[76, 96, 98] While many parents expressed a belief that sleeping close to each other strengthened the parent-infant bond[59, 69, 75, 79, 91, 93] and could compensate for time spent apart during the day,[50, 55] others did not believe that proximity during sleep impacted on the parent-infant relationship: "…, I think it is acceptable to have a baby sleep in a separate room alone. Mother's love never fades away…".[86] For many parents and infants, a need for proximity could span across twenty-four hours, creating an interdependence between infant sleep and parent use of space and time during the day.[74, 80] While infants were frequently dependent on their parents to support their sleep with their proximity[50, 70, 74], parents were reciprocally dependent on their infant's sleep to allow them to perform tasks such as sleeping themselves, resting, eating, working, interacting with others, and caring for their other children.[53, 61, 75, 76, 83, 86, 102] Daytime infant sleep locations were often chosen by parents to maximize closeness which could lead to the use of a range of general furniture and portable infant equipment in their efforts to balance their own and their

infant's need for proximity with their need to use the time to complete other tasks.[70, 74, 76, 80, 83, 88, 96, 104] Some parents, however, described being unable to do anything even when their infant was asleep because they would only sleep if their parent lay down beside or held them and would wake once the parent moved or put them down[50, 70, 74]: "*When I put him down, he woke up... I couldn't do anything in the meantime."*[74] Irrespective of whether parents were asleep or awake, their use of time and space was shaped by their infant's sleep and aspects of their infant's sleep was often reciprocally shaped by where and how their parents wished to use their time.

Negotiating control and dependence within the parent-infant relationship

In addition to sharing space and time, meeting both their infant's sleep needs and their own needs frequently involved negotiations of dependence and control between parents and their infants.[62, 66, 67, 75] While some parents described how they did not wish to, or believed they could not, control their baby's sleep or wake times[53, 61, 100]: "*She calls the shots and we work around it basically*"[53]; others held an expectation that they should be able to control their infant's sleep with the aim of making them fall asleep quicker, according to the parent's preferred schedule, or with less support[53, 62, 65, 66, 68, 83, 100]: "*...he basically just has to join our schedule—too bad for him!*".[53] Parents' efforts at controlling their infant's sleep had varying outcomes for infants and parents, with some describing success,[65, 66] distress,[65, 80] or both: "*It was a bit harrowing having to persevere with not going to him immediately, but in the long run it was fine...*".[66] The parents who perceived their infants to be in control of their own sleep had a range of experiences, with some describing frustration at their inability to control their infant's sleep[62, 66, 73, 105]; some accepting, or expressing resignation, that "*The baby*

has his own pace" [53, 61, 74]; and others believing that it was better, easier, or normal to allow infants to dictate their own sleep schedules. [51, 61, 100, 101]

Parents' beliefs and values around infant independence varied similarly. Many parents valued independence in their infant when settling to sleep, [60, 65, 76, 80, 91, 106] even in cases where they found leaving their infant to fall asleep alone emotionally challenging:

> Then I'm tucking him in nicely and I'm consciously leaving the room, since I want him to fall asleep by himself… So that you're not tempted to stay with him and watch him fall asleep. While this is very cute, but … no, I really try to walk away, close the door and make myself doing that.[106]

Other parents expressed acceptance that their infant depended on their proximity or active involvement to settle to sleep.[80, 91, 96, 100] While some believed that allowing dependence for infant sleep could lead to extended dependency in later childhood [36, 60, 65, 75, 80, 91, 103, 107]: "*She doesn't go to sleep by herself and that means she's never going to be an independent person",* others cited concerns that separate sleep might lead to their infant becoming insecure or prematurely independent as an older child.[55, 93]

Parents' perspectives on dependence in, and control of, infant sleep had the potential to impact on the parent-infant relationship. Some parents related the effort involved in supporting their infant's sleep to whether their infant was "*good*" [81, 83] or "*difficult"*[73] and, in some cases, the parents' struggles with supporting their infant's sleep placed the parent-infant relationship at risk[61, 66]: "*…with the child not sleeping I was at the point where I probably could have abused him".*[66] For some parents the spatial and temporal interdependence of parent-infant sleep was experienced as enjoyable and as reinforcing the parent-infant bond, whereas for others

it could be experienced as a distressing challenge to their sense of control and independence and lead to negative feelings towards their infant.

Theme 4: The impact of socio-cultural context on parent-infant sleep

The impact of the family and social circle

Prior experience of infant sleep within the family or social circle was described by many parents as positive because it equipped parents with realistic expectations of infant sleep and confidence in their own judgement,[35, 37, 68, 77, 88, 97, 101]. In some cases, where there was a previous tragedy in the wider family, parents' expressed a resolve to adhere to safe infant sleep guidelines.[56, 76] For some parents, extended family support was an important aspect in facilitating them to meet both their own and their infant's sleep needs.[61, 68, 76, 83, 96] However, there were also some parents who did not seek this support as they found that their families or friends were unsupportive,[58] judgmental,[65, 70, 107] or not sufficiently considerate of their sleeping infant's safety.[72, 76] Many parents described how their own parents' or siblings' parenting views or family traditions influenced their own infant sleep practices,[50, 76, 80, 92, 96, 106] while others' described diverging or rejecting the advice and practices of their extended family if they regarded them as unsafe, irrelevant, or contrary to their own judgement, beliefs or values.[58, 76, 80, 87, 96, 100] While the family and social context had the potential to influence the practice and experience of parent-infant sleep, the extent of its influence was ultimately dependent on parents' decisions based on their personal interpretations, beliefs, and values.

## Socio-cultural influences on parent-infant sleep

While many of the included studies identified culture or ethnicity as a primary influencing factor on parent-infant sleep practices[35, 54, 60, 74, 80, 85-87, 89, 91-95, 103, 105, 108]; many others highlighted how parents' values and decisions also frequently diverged from the predominant practice of their cultural or ethnic groups.[57, 76, 80, 86, 99, 107] Even in culturally homogenous groups of parents, it was stressed that "*one size does not fit all*"[80] in terms of parents' approach to infant sleep locations or infant settling strategies. Competing factors such as safety concerns,[56, 76, 103] pragmatic considerations[76] or the parent's personal beliefs and values around infant sleep[80, 86, 96] were identified as factors that could influence a parent's adherence to dominant cultural or ethnic sleep practices. While parents could exercise a degree of choice around their adherence to the common practices of their ethnic or cultural group, socio-economic factors, such as limited bedroom space,[36, 50, 52, 56, 63, 70, 85] housing standards,[36, 65] or living in unsafe communities[36] often limited parents' agency in their parent-infant sleep decisions. As one study highlighted, "*diversity and complexity is to be expected within a culture*"[99] in relation to parent-infant sleep practices. However, socio-economic status was described as a limiting factor that restricted parents' ability to make choices on how to best meet their own and their infant's sleep-related wellbeing and safety needs.

Line of argument synthesis of the findings

In meta-ethnography, a line-of-argument synthesis is an expression of the synthesis findings that "*puts the similarities and differences between studies into interpretive order*".[27] In the case of this synthesis, the line-of-argument is expressed as both a written summary of the findings and a diagrammatic representation of parent-infant sleep. Figure 3 encompasses the

four themes generated from this synthesis through representing the interaction between the parent and infant sleep needs of mutual wellbeing and infant protection as two overlapping circles in the center of the diagram. The third theme of connection: sleep and the parent-infant relationship is represented by the inner rectangle that contains the two circles and serves to demonstrate that the negotiation of mutual wellbeing and infant protection is occurring within the context of the parent-infant relationship. These three themes are then embedded in an outer rectangle representing the influences of the wider familial and sociocultural context. The overlapping circles are represented as being in dynamic motion to reflect parents' described experiences of parent-infant sleep as non-linear involving intermittent periods of sleep pattern synchrony and asynchrony. Greater portions of circle overlap represent the experience of increasing parent-infant sleep synchrony. A smaller portion of circle overlap represents an experience of increased parent-infant sleep pattern asynchrony. The parent sleep-adaptation and infant sleep-consolidation processes are shown as influencing the degree of parent-infant sleep synchrony with the impact of disruption to either or both processes leading to increased asynchrony.

Figure 3
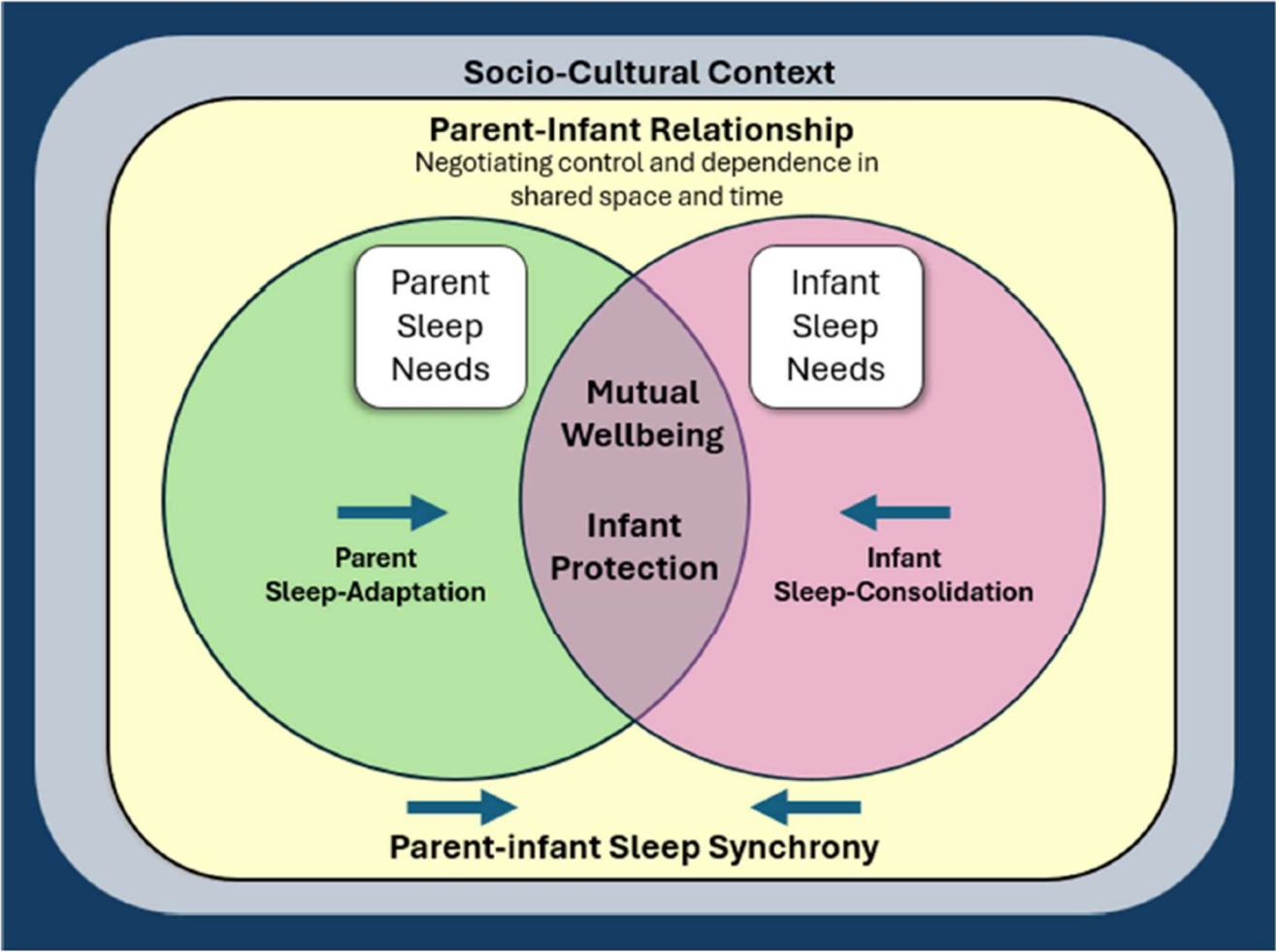
Diagrammatic Synthesis of Parent-Infant Sleep

DISCUSSION

This synthesis advances the understanding of parent-infant sleep as a highly interactive, multi-dimensional experience and confirms its importance to parents. These findings demonstrate that, in the absence of an agreed definition, the construct of co-occupation offers an applicable theoretical framework to describe parent-infant sleep as a reciprocal parent-infant experience of engaging in interactive sleep preparation and participation activities with the desired outcome of meeting shared sleep needs. Further studies are required to test the validity and applicability of this proposed definition, in addition to the need to build consensus within the field of parent-infant sleep.

The findings of this synthesis also highlight the limitations of researching parent and infant sleep in isolation by confirming interactivity as a defining aspect of parent-infant sleep irrespective of the degree to which it is experienced as positive or challenging. This understanding offers greater insight into the phenomenon of parent-infant sleep and encourages consideration of both parent and infant sleep needs in evaluation, treatment, and research of postnatal sleep problems. Although well-established in the field of occupational science and therapy,[109] the applicability of the construct of co-occupation to describe parent-infant sleep across multidisciplinary settings requires further research.

Parents identified meeting both their infant's and their own sleep needs as the desired outcome of parent-infant sleep. Parent-infant sleep needs were described as two-fold: maintaining mutual sleep-related wellbeing and protection of the sleeping infant. Specifying the desired outcome of parent-infant sleep has specific utility to researchers and to health and social care professionals

seeking to better understand or support parent-infant sleep.[110] While mutual sleep-related wellbeing has been previously cited as a desired outcome of parent-infant sleep,[23, 111] parents' and infants' mutual need to be assured of the sleeping infant's safety is afforded less emphasis. Echoing the findings of this synthesis, recent research has identified the need for interventions that support both parent and infant sleep while maintaining infant sleep safety.[112] A specific focus is required on the early postnatal months when the risks faced by the sleeping infant are greatest and the asynchrony between infant and parent sleep patterns is often at its peak. [113, 114]

Parent-infant sleep synchrony is proposed as a construct to articulate the degree to which parents perceive that both their own and their infant's sleep-related wellbeing and safety needs are being met. The phenomenon of parent-infant sleep synchrony has been established previously; however, existing research focuses primarily on infant regulation and sleep-consolidation in response to maternal physiology and activity patterns.[16, 19, 115, 116] While the potential for parent sleep-adaptation to occur across physiological [117]; behavioural [118]; and psychological [119] domains is documented, its multi-dimensional nature and bidirectional relationship with infant sleep-consolidation, and its role in supporting parent-infant sleep-related wellbeing and infant protection needs, have not been previously represented in an integrated framework. This synthesis describes infant sleep-consolidation and parent sleep-adaptation as interdependent processes that support greater parent-infant sleep synchrony over time. Further research is required to test this conceptualization of parent-infant sleep synchrony as a potential measure of the extent to which parent-infant sleep needs are being met and to identify the range and interplay of individual and contextual influencing factors. Longitudinal studies exploring parent-

infant sleep patterns of asynchrony and synchrony over time could provide further insights into normative parent-infant sleep progressions, expected intermittent disruptions, and key factors contributing to prolonged periods of parent-infant sleep asynchrony. The outcomes of such studies have the potential to inform sleep interventions and improve outcomes for both infants and new parents.

Co-occupational theory recognizes both the parent and the infant as active participants in shared sleep activities situated in their relational, spatial and temporal context.[25] Application of the construct in this synthesis has highlighted the bidirectional influences between sleep and the parent-infant relationship. Factors such as parents' cognitions in relation to sharing space and time with their sleeping infant and their interpretation of their infant's responses to specific sleep locations and practices were shown to both reflect and influence the parent-infant relationship. The potential for parents' expectations, values, and beliefs to influence parent-infant sleep is extensively addressed in the body of research, where a relationship between parental cognitions and infant sleep problems has been described.[12, 120] However, underlying much of this research is an assumption that infants respond relatively uniformly to parents' proximity and degree of involvement at sleep times, which does not reflect the experiences of many parents in this synthesis. Parents in this synthesis described how their infant's sleep behaviors and preferences influenced their responses and practices, yet researchers have acknowledged that the relevance of individual infant factors is under-researched in the context of infant sleep.[12, 120] Future research recognizing the individuality of parents and infants and the uniqueness of each relationship has the potential to inform a more complete understanding of the interactions between sleep and the parent-infant relationship.

Current dominant infant sleep interventions often fail to acknowledge parent and infant individuality by prescribing predetermined strategies for all parent-infant dyads.[9] There is also evidence that parents' adherence to restrictive safe infant sleep guidelines is suboptimal.[112] Alternative parent-infant sleep interventions should recognize the individuality of each parent-infant dyad and honor parents' personal beliefs and values, while offering complete and objective information about the risks and benefits related to both mutual sleep-related wellbeing and infant sleep safety. This approach would align parent and infant sleep support with international best practice principles such as the integration of each family's unique background and preferences, the provision of comprehensive and impartial information, and the delivery of services tailored to individual needs.[121, 122]

The influence of family, society, and culture on parent and infant sleep practices, as described by parents in this synthesis, is widely recognized.[22] Application of the multi-dimensional theoretical lens of co-occupation expands this understanding by emphasizing commonalities, while still revealing diversity within groups of parents that share a common culture or ethnic background. This reflects research findings that identify positive outcomes for their children as the common goal underlying most parenting practices irrespective of race, ethnicity, family structure, education, income, or gender.[123] While traditional practices influenced many parents in this synthesis, their personal beliefs and values in relation to how best to meet their own and their infant's sleep-related wellbeing and infant safety needs often took precedence over adherence to cultural or dominant societal norms. In contrast to cultural background or ethnicity, parents in this synthesis were frequently unable to exercise choice in relation to the impact of

adverse socio-economic or housing circumstances on their parent-infant sleep practices. This finding is in line with recent commentaries that suggest that parents' socio-economic status is a greater determinant of risk of death or injury to the sleeping infant than culture or ethnicity.[124]

These findings provide an insight into the multi-dimensional interactions between parent-infant sleep needs; the supportive role of the interdependent processes of infant sleep-consolidation and parent sleep-adaptation; the bidirectional influence of the parent-infant relationship; and subjective relevance of socio-cultural context. Further research to test the application of the findings of this synthesis across a range of clinical and community settings, and alignment with expert professional and academic perspectives, is required.

CONCLUSION

This synthesis describes the relationships between four themes to generate a novel understanding of parent-infant sleep as an interactive, dynamic, and reciprocal phenomenon where parents' sleep experiences are shaped by their infant's sleep and vice versa. Shared parent-infant sleep needs were identified as twofold: mutual sleep-related wellbeing and protection of the sleeping infant. The concept of parent-infant sleep synchrony is proposed to describe the degree to which a parent perceives these sleep needs to be adequately met. Infant sleep-consolidation and parent sleep-adaptation are presented as interdependent processes with the potential to support parent-infant sleep synchrony. The risk of prolonged parent-infant sleep asynchrony is highlighted where there is persistent disruption to one, or both, of these processes. Bidirectional influences between sleep and the parent-infant relationship are framed within the context of negotiating control and dependence in shared time and space. The parent's personal interpretation of their

socio-cultural context via their personal beliefs and values determined the impact of ethnic or cultural tradition on their parent-infant sleep practices, while socio-economic factors could limit parents' ability to meet shared parent-infant sleep needs. The findings of this synthesis offer a comprehensive, multi-dimensional understanding of parent-infant sleep with the potential to inform effective parent-infant sleep interventions that lead to better outcomes for parents and infants.

LIMITATIONS

The inclusion of only English-language papers published in peer-review journals represents a limitation of this systematic review as it potentially introduces a language and publication bias and the potential omission of relevant data. One of the strengths of this study is the range of variability of the included primary studies, achieved through exhaustive sampling which yielded data from a wide range of geographic locations, cultures, and contexts. A limitation of the data nonetheless was that mothers represented at least 95%, while fathers provided less than 5% of the participants.

In addition, it is possible that the research topics of the included studies influenced the themes and subthemes generated by this synthesis. For example, 51% of the studies included had research questions related to either safe infant sleep or infant sleep location. Inclusion of minority views, in addition to widely held perspectives, ensured that the synthesis represented the breadth of the available data relevant to the objective of this synthesis.

Finally, qualitative studies, by their nature, lack generalizability, as they focus on in-depth, context-specific data; therefore, quantitative research is needed in the future to assess the broader applicability of the findings of this synthesis. As secondary research, qualitative evidence synthesis involves multiple layers of interpretation.[43] A rigorous and systematic approach to data extraction and analysis, and repeated reading and consideration the context of primary studies to maintain the integrity of their findings, was undertaken at all stages of the research process to address this limitation.

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DATA AVAILABILITY STATEMENT

Template forms and extracted, analyzed and synthesized data that support the findings of this study are available from the corresponding author (PF), upon reasonable request.

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Table 3

No.	Author(s)	Aim of study	Country	Population	Infant Age (Months)	No of Ppnts	Theoretical Framework	Sampling	Data Collection Methods	Methodology	Quality Rating
1-5	Ajao et al., 2011 Joyner et al., 2010 Joyner et al., 2016 Moon et al., 2010 Oden et al., 2010	To examine SIDS related beliefs, knowledge, decisions, and perceptions of black mothers around sleep environments, positions, location, and use of pacifiers.	USA	Mothers	1.1-9.3	83	Not specified	Convenience	13 Focus Groups & 10 Individual Interviews	Grounded Theory	B
6	Aslam et al., 2009	To explore socio-cultural influences on migrant mother decisions and beliefs regarding co-sleeping as a risk factor for SIDS.	Australia	Mothers	≤12	5	Social Constructivist	Purposive	Semi-structured interviews	Principles of discourse analysis applied	B
7	Bailey, 2016	To explore the lived experiences of breastfeeding mothers who share a sleep surface with their infants in a Western cultural setting	Australia	Mothers	Not specified	6	Evolutionary biology / anthropology	Purposive supplemented by convenience	Semi-structured interviews	Interpretive Phenomeno-logical Analysis	C
8	Ball, 2002	This paper examines the practice of parents sharing a sleep surface with their young infants.	UK	Mothers	1-3	253	Not specified	Convenience	Sleep diaries and interviews	Iterative process	C
9	Capper et al., 2022	To identify factors influencing decisions concerning infant sleep practices of mothers of preterm infants.	USA	Mothers	Data extracted for ≤ 24mo	98	The health belief model	Convenience	Mixed methods study. Online survey generated qualitative data.	Content analysis.	C
10	Caraballo et al., 2016	To investigate practices, knowledge, attitudes, and beliefs regarding safe infant sleep among adolescent mothers.	USA	Mothers	2-21	43	None, in line with grounded theory	Convenience – self-selected.	7 Focus Groups	Grounded theory	C
11	Chae et al., 2022	To explore the sleep ecology of infants under two years of age and their mothers	South Korea	Mothers	3-19	20	Ecological model	Purposive	In-depth interviews	Thematic analysis	A
12	Chianese et al., 2009	To understand parents' beliefs, and motivations for sharing a sleep surface, their safety concerns and attitudes to advice.	USA	Mothers (26) Fathers (2)	1-6	28	Theory of reasoned action	Purposive	4 Focus groups of 6- 10 ppnts	Grounded theory	B
13	Cole et al., 2021	To understand which safe sleep recommendations parents find most challenging to implement, identifying barriers and challenges to adherence.	Australia	97% Mothers (3% = other unspecified primary caregivers)	3	3341	Medical model / public health	Convenience	Cross-sectional survey with qualitative free-text items	Content analysis	B
14	Cox et al., 2021	To listen to the voices of young mothers around their experience of motherhood.	USA	Mothers	4-24	179	Emerging Adulthood (Arnett)	Purposive	3 interviews at infant age 4, 12, and 24 months	Content Analysis	B
15	Crane & Ball, 2016	To discover how white British and Pakistani mothers recall, understand and interpret SIDS-reduction guidance, and to explore whether and how they implement this guidance.	UK	Mothers	2-3	46	Personal-social-cultural model	Convenience	In-depth narrative interviews	Narrative thematic analysis	B
16	Doering & Durfor, 2011	To generate a grounded theory of fatigue and sleep in nondepressed lower-income urban women during the 6 months following childbirth	USA	Mothers	1-6	16	Symbolic interactionism	Purposeful	Semi-structured interviews at month 1,3, & 6	Grounded theory	B
17	Doering et al., 2017	To generate a grounded theory of the process used by postpartum women with depressive symptoms to manage sleep and fatigue.	USA	Mothers	1-6	19	Not described	Convenience	Interviews at month 1,3, & 6	Grounded theory	B
18	Fägerskiöld, 2008	To explore first-time fathers' experiences during early infancy of their children.	Sweden	Fathers	5-9	20	Symbolic interactionism	Theoretical	Individual interviews	Grounded theory	A
19	Gaydos et al., 2015	To compare decision making regarding sleep practices of mothers to better understand how to effectively mitigate risk.	USA	Mothers	≤6	60	Not stated	Convenience	Focus groups	Content analysis	C
20	Grant et al., 2021	To identify if the Pepi-pod® was perceived as culturally safe and to explore the process of implementing the program.	Australia	Mothers	0- 3	4	Cultural focus .	Purposive	Photo elicited yarning sessions, focus groups, field notes	Thematic analysis	B

21	Gray et al., 2022	To discover the sleeping habits and routines of Hispanic toddlers at risk for obesity through the perspective of their mothers.	USA	Mothers	6-18	14	Socio-ecological model	Purposive	Interviews	Phenomenology Thematic analysis	C
22	Herman et al., 2015	To investigate beliefs among Africa American and American Indian families about infant safe sleep practices	USA	54 Mothers 26 (13 M, 13 F) Supporters	0-24	54	None, in line with grounded theory	Convenience	Focus groups	Grounded theory	C
23	Howard et al., 2022	To investigate barriers and facilitators of infant sleep practices.	USA	13 mothers 2 fathers	0-12	15	None, in line with grounded theory	Purposive	3 focus groups	Grounded theory	B
24	Hsu et al., 2017	To explore the perceptions and experiences of parental professional help-seeking for infant sleep and sleep-related concerns	Taiwan	Parents 19 mothers 1 father	12	20	Not specified.	Purposive	Data sheet followed by face-to-face interviews	Thematic content analysis	B
25	Hwang et al., 2021	To identify barriers and facilitators to adherence to safe sleep practices among mothers of preterm infants.	USA	Mothers	2-6 months after hospital discharge	23	Theory of Planned Behaviour	Purposeful	Interviews by 'phone or video conference	Grounded theory	A
26	Jacobson & Himes, 2021	To examine perceptions of the AAP guidelines held by parents and health care providers as they relate to guidelines comprehension and compliance.	USA	Mothers Fathers Grandmother Guardians Professionals	Not specified	87	Public health campaign Not specified	"There was a purposive element in sample selection"	Online focus groups conducted by commissioned research firms	Not specified	D
27	Jones et al., 2017	To describe what approaches Māori parents use to get their babies to sleep, and what factors they identify as influencing their decision-making.	Aotearoa New Zealand	8 Mothers 2 fathers	2 -24	10	Cultural perspective	Purposeful supplemented by convenience	Interviews	Kaupapa Māori methodology Thematic analysis	B
28	Kennedy et al., 2007	To learn from mothers about their experience of sleep during pregnancy and the immediate months of becoming a new mother.	USA	Mothers	~3	20	Mercer's framework of becoming a mother	Convenience sample	Semi-structured interviews	Interpretive hermeneutical approach	C
29	Kihlström et al., 2020	To understand caregivers' perspectives on safe sleep practices.	USA	5 from caregivers from 3families	0-6	5	socio-ecological model	Convenience	Photovoice methodology including interviews	participatory research Thematic Analysis	C
30	Lau & Hall, 2016	To explore Canadian mothers' experiences with infant sleep safety	Canada	Mothers	0-6	14	Not specified	Purposeful sampling	Interviews	Grounded theory	B
31	Liamputtong, 2002	To explore the childrearing beliefs and practices related to child health amongst the immigrant Hmong culture.	Australia	Mothers	Not specified	27	Ethnography	Snowball	Interviews and observations	Thematic analysis	D
32	MacFarlane et al., 2021	To explore infant sleep practices and key motivators among selected Māori and non-Māori mothers in relation to the risk of SUDI.	Aotearoa New Zealand	Mothers	1-6	30	Motivation theory (Ryan & Deci)	Purposeful	Interviews	Kaupapa Māori cultural framework Thematic analysis	A
33	Marshall & Thompson, 2014	To provide an account of the subclinical spectrum of postnatal psychological difficulties from the perspective of mothers.	Australia	Mothers	1.5-11	7	Not specified	Purposive	Face-to-face interviews	Interpretive Phenomenological Analysis	C
34	Mathews & Moon, 2015	To compare infant care practices among African American and Hispanic families	USA	Mothers	≤6	89	Not specified	Purposeful	Interviews and focus groups.	Grounded Theory	D
35	McKenna & Volpe, 2007	An exploration of parents' accounts of sharing a sleep surface.	Canada USA Australia UK	Mothers	Not specified	>200	Not specified	Self-selected via websites	Online questionnaire	Not specified	D
36	Morelli et al., 1992	To come to a broader understanding of cultural practices in two different cultures.	USA Guatemala	Mothers	2-28 (USA) 12-22 (Mayan)	32	None specified	Convenience	Interviews and participant drawings.	Not described	D
37	Mosley et al., 2007	To determine decision-making factors for infant sleep position among low-income parents and other relatives.	USA	Mothers (79% - 107) Fathers (10% - 14) Caregivers (11% - 15)	<12	121	Not specified	Convenience	18 Focus groups	Not specified	C

38	Muller, 2022	To explore the subjective well-being of parents in the context of infant sleep problems.	South Africa	8 mothers 2 fathers	3-12	10	Subjective well-being model	Nested and Snowball sampling	Telephone or virtual interviews	Inductive and reflexive	B
39	Murray et al., 2019	To investigate how infant settling was perceived "through the eyes" of new mothers.	Vietnam	Mothers	3-6	5	Traditional humoral schemas	Snowball	Photo elicitation followed by interviews	Visual ethnographic approach	A
40	Murray et al., 2018	To describe caregivers' understandings of, and responses to, unsettled infant behaviors and the family caregiving contexts in which it occurs.	Vietnam	Mothers	0-6	21	Cultural perspective	Purposive	Semi structured Interviews	Thematic Analysis	A
41	Noble et al., 2002	To explore parents' perceptions of using controlled comforting as a method of sleep management.	Australia	10 mothers 1 father	6-18	11	Narrative Interpretative	Purposeful	Interviews	Emden's core story creation process	D
42	Ou et al., 2022	To explain how and why mothers develop persistent and intense anger, the steps they take to manage their anger, and outcomes associated with its management during the postnatal period	Canada	Mothers	7-23	20	Relational autonomy theoretical framework. Anger recalibration theory.	Purposeful sampling	Interviews	Grounded theory	A
43	Pease et al., 2017	To understand the views and decision-making process of mothers of babies at risk of SIDS on the infant sleep environment and safe sleep messages.	UK	Mothers	0.75-6.5	20	None specified	Purposive sampling for SIDS risk factors	Semi-structured interviews	Thematic analysis, continuous comparative method	B
44	Rolls & Hanna, 2001	To understand the experiences of women and families and how they coped with and managed an infant with sleep problems.	Australia	28 women 2 men 1 g/mother	2.5–18	28	None specified	Convenience	4 focus groups	Thematic analysis	D
45	Rowe, 2003	The study investigated ways in which new and experienced mothers of an infant constructed specific care practices.	Australia	Mothers	1-12	21	Theory of social context/locales (Giddens, 1991)	Purposive and convenience sampling	In-depth interviews and reflective journals	Qualitative approach based on narrative research principles.	C
46	Rudzik & Ball, 2016	To investigate women's perceptions of the nature of infant sleep and of links between infant feeding method and sleep practices in the first year.	UK	Mothers	<12	39	"Proximal self-care" Constructivist	Convenience	7 Focus groups – semi-structured interview guide.	Experience-near approach to thematic analysis	C
47	Runquist, 2007	To construct a substantive theory of postnatal fatigue.	USA	Mothers	2-5 weeks	13	Social process of persevering over time	Theoretical sampling followed by	Semi-structured interviews	Grounded theory	A
48	Shimizu et al., 2017	To explore the relationship between values and practices and how social change is negotiated by individual mothers.	Japan	Mothers	≤24	51	Theory of social change and human development	Theoretical	Data collected from internet	Qualitative thematic analysis	B
49	Shorey et al., 2017	To explore first-time fathers' postnatal experiences and support needs in the early postnatal period.	Singapore	Fathers	1-3.5	15	Not specified	Purposive	Semi-structured interviews	Descriptive qualitative Inductive	B
50	Stiffler et al., 2020	To identify why African American mothers do not tend to follow the official safe sleep recommendations.	USA	Mothers	>6	15	Not specified	Convenience	2 focus groups	Modified ethnography	C
51	Tipene-Leach et al., 2000	To increase understanding of present day Maori infant care practices	Aotearoa New Zealand	17 Mothers 9 fathers	<12	26	Māori cultural perspective	Purposive	7 focus groups and one individual interview	Thematic analysis	B
52	Tomori et al., 2016	To investigate breastfeeding experiences in societies where breastfeeding is promoted but formula feeding remains common.	USA Canada	Mothers	Not Specified	18	Cross-cultural, evolutionary, historical, and feminist perspectives	Not Specified	Ethnographic observation and in-depth interviews	Anthropological analysis	C
53	Tsai et al., 2014	To describe the aspects of infant sleep perceived as problematic by first-time mothers and to discover how mothers cope	Taiwan	Mothers	<3	12	transactional model of infant sleep–wake regulation	Convenience supplemented by purposive	Interviews	Qualitative content analysis	B
54	Tse & Hall, 2008	To describe parents' perspectives about implementing a sleep intervention.	Canada	N = 25 14 mothers, 11 fathers	9-16	25	Not described.	Purposive sampling	Interviews	Grounded theory	C
55	van Schaik et al., 2020	To articulate the practices relating to establishing daily rhythms in infants as described by mothers.	Netherlands USA	Mothers 33 Dutch 41 US	2-6	74	Heuristic Cultural perspective	Purposive	Questionnaires, interviews & diaries	Inductive thematic analysis	B

56	Veltkamp et al., 2020	To analyze family practices informed by attachment theory within their social, cultural, and material contexts.	Nether-lands	Mothers (14) Fathers (4)	≤12	12	Attachment theory Critical Sociological Perspective	Purposive followed by snowball	2-time-point interviews triangulated with observations at home	Ethnographic description	C
57	Welles-Nystrom, 2005	To examine the Swedish practice of co-sleeping and relate it to the cultural discourse on the gendered family and health.	Sweden	60 Parents in all four age cohorts (50% assumed to be ≤ 2yrs)	Data relevant to 6 and 18 month old cohorts extracted	30	Theory of Parents' Cultural Belief Systems	Snowball	Questionnaires, maps of home, diaries, semi-structured interviews	Ethnographic descriptions, thematic analysis, calculations from diaries	C
58	Zahra et al., 2015	The aim of this study was to explore successful breastfeeding mothers' experiences of the difficulties of breastfeeding.	Iran	Mothers	≤12	16	Not specified	Purposeful	Unstructured interviews	Qualitative Content Analysis	C
59	Zambrano et al., 2016	To understand facilitators and barriers that exist to getting a good night's sleep among these high-risk mothers.	USA	Mothers	3-6	18	Not specified	Convenience	Semi-structured interviews	Thematic coding and content analysis	C
60	Zoucha et al., 2016	Explore the cultural influences of safe sleep practices by African American caregivers of children under 2 years old.	USA	Primary Caregivers (16 Female, 3 Male)	≤24	19	Contextual cultural perspective	Convenience followed by snowball	Interviews fieldwork, observation, focus groups	Focused Ethnography	C
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Table of Primary Study Characteristics

Table 4

Themes	Shared parent-infant sleep needs: Mutual wellbeing and infant protection			Parent-infant sleep synchrony and asynchrony			Connection: Sleep and the parent-infant relationship		The impact of socio-cultural context	
Subthemes / **Author(s)**	Mutual wellbeing	Parent protection of the sleeping infant	Negotiating mutual wellbeing and infant protection	Asynchrony in early parent-infant sleep	Increasing sleep synchrony	Intermittent disruptions and prolonged asynchrony	Shared sleep spaces and shared time	Negotiating control and dependence	The impact of the family and social circle	Socio-cultural influences on parent-infant sleep
Ajao et al., 2011		✓							✓	✓
Aslam et al., 2009		✓					✓	✓		✓
Bailey, 2016	✓	✓	✓	✓						✓
Ball, 2002							✓		✓	✓
Capper et al., 2022	✓	✓	✓	✓				✓		
Caraballo et al., 2016	✓						✓			
Chae et al., 2022	✓			✓	✓	✓	✓	✓		✓
Chianese et al., 2009		✓	✓				✓		✓	✓
Cole et al., 2021	✓	✓	✓			✓				✓
Cox et al., 2021	✓			✓						
Crane & Ball, 2016							✓	✓		✓
Doering & Durfor, 2011	✓		✓		✓	✓				
Doering et al., 2017	✓	✓		✓	✓	✓	✓	✓	✓	
Fägerskiöld, 2008	✓							✓		
Gaydos et al., 2015		✓	✓						✓	✓
Grant et al., 2021		✓					✓			✓
Gray et al., 2022								✓		✓
Herman et al., 2015	✓		✓					✓		✓
Howard et al., 2022	✓		✓	✓		✓	✓			
Hsu et al., 2017				✓				✓	✓	
Hwang et al., 2021		✓		✓						✓
Jacobson & Himes, 2021		✓	✓				✓			
Jones et al., 2017	✓	✓			✓		✓	✓	✓	✓
Joyner et al., 2010	✓	✓					✓	✓		✓
Joyner et al., 2016	✓									
Kennedy et al., 2007	✓	✓	✓	✓	✓	✓	✓			
Kihlström et al., 2020		✓	✓						✓	✓
Lau & Hall, 2016	✓	✓	✓	✓	✓		✓			✓
Liamputtong, 2002		✓		✓						✓
MacFarlane et al., 2021	✓	✓	✓				✓	✓	✓	✓
Marshall & Thompson, 2014	✓			✓	✓	✓		✓		
Mathews et al., 2015		✓	✓							✓
McKenna & Volpe, 2007			✓				✓	✓		
Moon et al., 2010		✓	✓	✓	✓		✓		✓	
Morelli et al., 1992		✓					✓	✓		✓
Mosley et al., 2007		✓	✓							
Muller, 2022	✓						✓			
Murray et al., 2019			✓				✓			
Murray et al., 2018			✓				✓	✓	✓	✓
Noble et al., 2002	✓							✓		
Oden et al., 2010		✓	✓						✓	
Ou et al., 2022	✓			✓				✓		
Pease et al., 2017			✓						✓	
Rolls & Hanna, 2001	✓								✓	
Rowe, 2003	✓							✓	✓	
Rudzik & Ball, 2016				✓	✓			✓		
Runquist, 2007	✓			✓		✓				
Shimizu et al., 2017		✓					✓			✓
Shorey et al., 2017	✓			✓	✓					
Stiffler et al., 2020	✓	✓	✓						✓	✓
Tipene-Leach et al., 2000			✓	✓						✓
Tomori et al., 2016								✓	✓	✓
Tsai et al., 2014	✓			✓	✓	✓		✓	✓	
Tse & Hall, 2008						✓		✓	✓	✓

van Schaik et al., 2020					✓		✓	✓		
Veltkamp et al., 2020								✓	✓	
Welles-Nystrom, 2005							✓			✓
Zahra et al., 2015	✓									
Zambrano et al., 2016	✓			✓	✓	✓	✓	✓	✓	
Zoucha et al., 2016		✓							✓	✓

Contribution of individual studies to themes and subthemes