A1: PART 1 • RESEARCH REPORT

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ID 7

Supporting the Maternal Transition to Parenthood Through Sleep.

AUTHENTICITY

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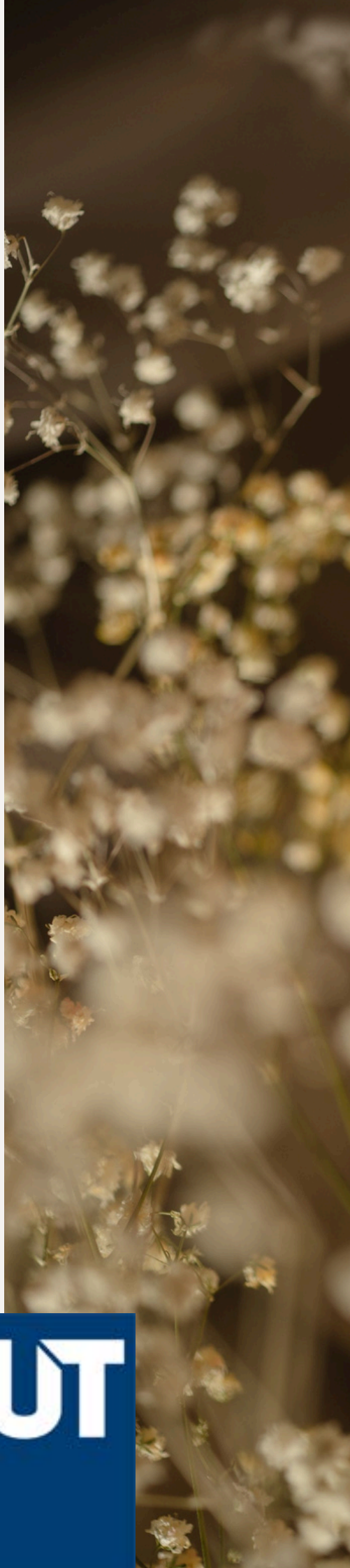
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- *Summarise extensive analysis notes into succinct workable concepts - **Chat GPT***
- *Support survey analysis process - **Chat GPT***
- *Collate transcripts into overarching themes - **Chat GPT***

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EXECUTIVE SUMMARY

Sleep disruption is common throughout pregnancy and postpartum and is influenced by physical, psychological, environmental and baby-related factors. Existing solutions often address general sleep rather than the changing needs of pregnant and postpartum mothers. The project's aim was to identify the underlying causes of poor maternal sleep and uncover opportunities for practical, adaptable solutions that support mothers throughout pregnancy and after birth. Secondary research and market benchmarking were supported by primary research consisting of 11 mother surveys and semi-structured interviews with maternal-care professionals, allowing first-hand and professional perspectives to be compared.

Key findings were 63.6% of survey participants rated their overall sleep as poor or very poor, with the third trimester identified as the most difficult period by 54.5%. Physical and baby-related factors were the most commonly identified sleep disruptions at 81.8% each. The cause of disrupted sleep changes throughout motherhood pregnancy is more heavily influenced by physical discomfort and positioning, while postpartum sleep becomes increasingly dependent on feeding, waking and caring for the baby. Interviews further identified preparation, routine, nutrition, calming and exercise as opportunities for intervention.

Existing products frequently require compromises between affordability, quality, functionality and aesthetics, while commonly used products such as pregnancy pillows still fail to address multiple physical symptoms simultaneously. The research identified opportunities around physical comfort, gentle movement/exercise, nighttime routines, nutrition and preparation. With the overall goal of developing solutions that are affordable, accessible and adaptable to mothers' changing needs.



CONTENTS

1.0 SECTION ONE

1.1 Introduction 01

1.2 Background 03

1.3 Benchmarking 04

2.0 SECTION TWO

2.1 Research 09

2.2 Analysis & Findings 12

3.0 SECTION THREE

3.1 Discussion 18

3.2 Design Implications 19

3.3 Conclusion 21

4.0 SECTION FOUR

4.1 References 22





1.0 SECTION ONE

The Topic

1.1 Introduction
1.2 Background
1.3 Benchmarking

1.1 INTRODUCTION

There is a fundamental understanding that sleep is a crucial function of the human body. It's a daily occurrence for your brain, to work in partnership with your body, to boost and maintain physical health. This action allows you to think, work, and learn to the best of your ability, filtering into all aspects of life (National Heart, Lung, and Blood Institute, 2022).

Sleeping during pregnancy is an issue for most women that gets progressively worse during gestation (Sedov et al., 2018). This can occur for a range of reasons; from physical changes such as body size or altered hormones, to sleeping disorders like insomnia or restless leg syndrome (RLS) (Facco et al., 2022). Research in this area has shown that low quality sleep has a connection to increased chances of preterm birth, extended delivery times, gestational diabetes, and much more (Meers & Nowakowski, 2022).

> *"Sleep deprivation in parts of the world is used as a torture. Missing a few hours last night and tonight is accumulative...Mums need to understand how important getting sleep and preparing for it is"*
> (MacMahon, 2026)

This is not a new issue, it has been ongoing since the first woman was pregnant. During the time between now and then, there have been countless developments in research and technology that have attempted to find solutions for these challenges. Most commonly, pregnancy pillows are found to be effective, less commonly are products like eye-masks or topical magnesiums that help with specific symptoms.

The aim of this project is to understand the foundational issues of sleep that mothers struggle with during pregnancy and postpartum, with the hope of applying these findings and creating a solution that can be adaptable to all **(Figure 1)**.



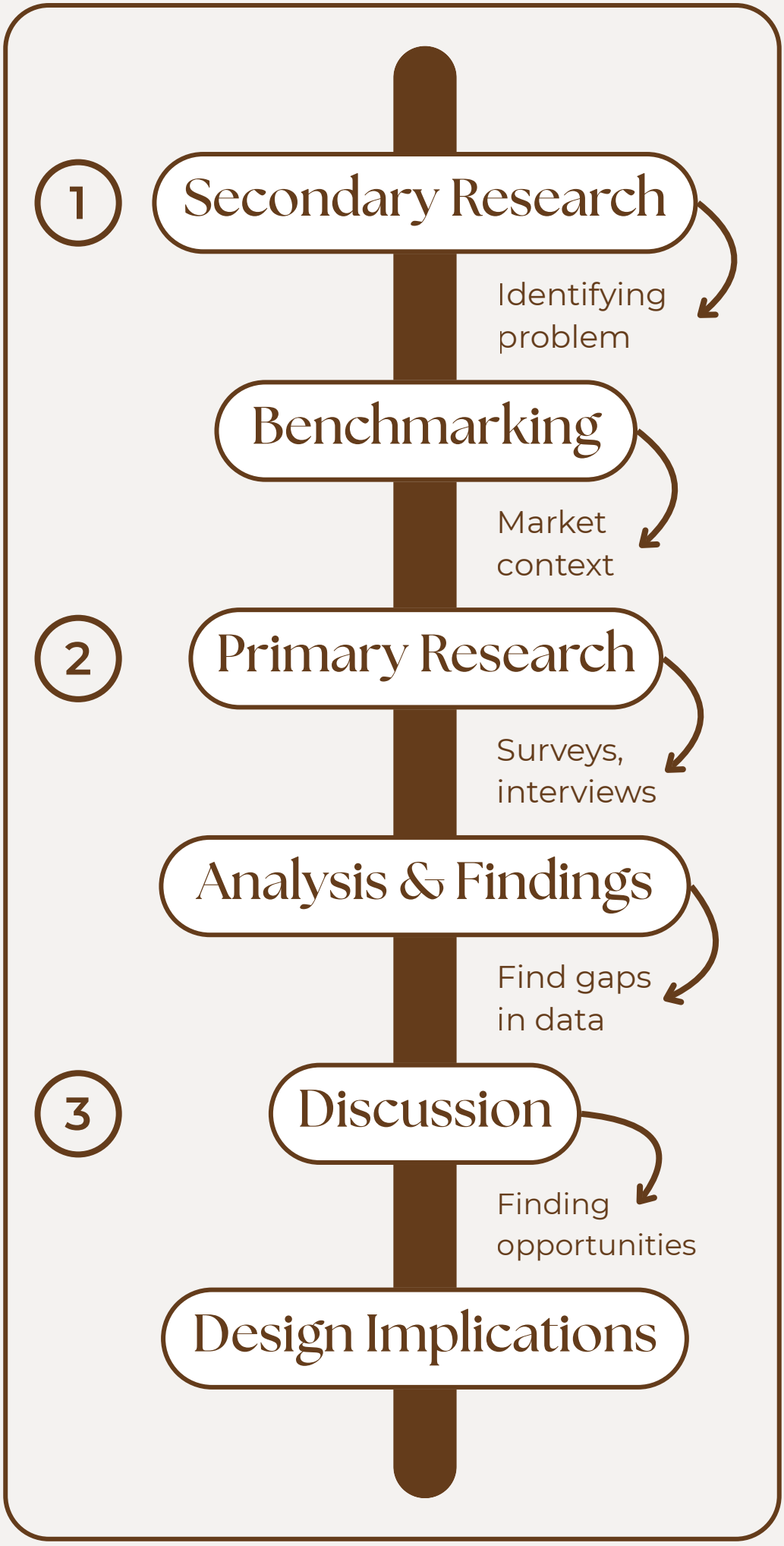


Figure 1: *Project Structure Diagram*

1.2 BACKGROUND

Despite the importance of sleep, by the end of pregnancy nearly 50% of mothers experience sleeping difficulties (Kember et al., 2023). As organs change to support a growing fetus, hormones also directly affect bodily systems, from the cardiovascular, to musculoskeletal and more (Kember et al., 2023). Every woman will have their own challenges that can impact sleep.

The increase of estrogen and progesterone hormones impacts the respiratory system and can act as drive stimulants that translate to snoring (Silvestri & Aricò, 2019). Anxiety, stress, RLS, lower back pain, and leg cramps, are typically worsened by poor sleep (Silvestri & Aricò, 2019).

Even though sleep disruption is predictable during pregnancy, it can still negatively impact life more than expected. Mean sleep decreases, wakings increase, and falling asleep takes longer (**Figure 2**), which continues two years postpartum for 50% of women (Peters et al., 2023). This lack of quality sleep can translate into higher chances

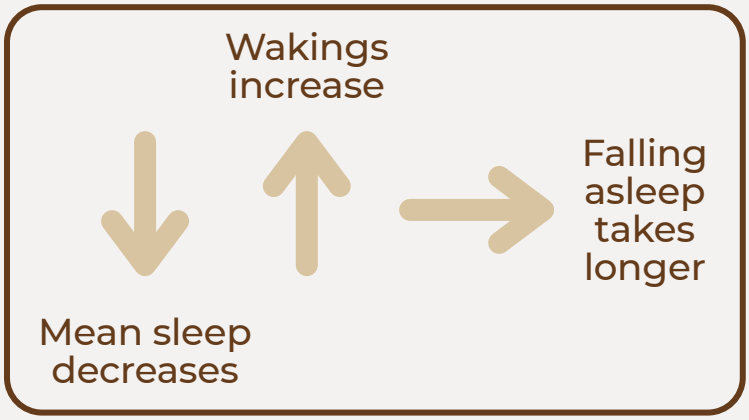


Figure 2: *Sleep Negatively Impacting Life.*



of preterm birth, cesarean birth, lower birth weight, increased blood pressure, and postpartum depression (Peters et al., 2023). Beyond that, sleep has the potential to impact quality of life through social, environmental, mental, emotional, and physical lenses.

Not getting enough sleep during pregnancy causes daily dysfunction, loss of family welfare, and driving ability It can decrease functions of the immune system, causing unexplainable irritability, less social interaction, and aggressive behaviour (Rezaei et al., 2013).

There are many interventions that attempt to, or solve these issues. Comprehensive sleep hygiene means the appropriate bedroom temperature, reducing fluids at night, suitable diet, and support pillows available (Polo-Kantola, 2022).

Other, non-pharmaceutical solutions, cover cognitive behavioural therapy (CBT), acupuncture, exercise and yoga. Studies have shown that persistent non-strenuous physical activity (water-based exercise, aerobics, etc.) for more than an hour, can positively impact sleep disorders during pregnancy (Liu et al., 2025). CBT is also proven to lower insomnia severity all the way to 2-year postpartum (Bei et al., 2021). Medications can always be considered, but doctors are wary of prescribing anything that impacts lactation (Miller et al., 2019).

Overall, sleep difficulties during pregnancy are common, varied, and can affect more than just sleep quality. A range of existing strategies and products are available to help manage these difficulties, so it's important to understand what solutions are being offered.





1.3 BENCHMARKING

Benchmarking is a functional tool for effective research that allows existing ideas to be explored, ensuring nothing is repeated, but improving what is available to the intended market (Lankford, 2022). The pregnancy-sleep assistive market has a narrow offering of solutions, but adaptations for each are extensive. In depth research was conducted to explore available concept groups (See Appendix B1); pregnancy pillows/wedges, topical magnesiums, weighted/blackout eyemasks, and white noise machines. This report will benchmark pregnancy pillows and eyemasks, aiming to understand what is offered and failings, to ensure following design decisions mirror opportunities identified.

Pregnancy Pillows.

Table 1 shows a broad range of pregnancy pillows ranked against benchmarking criteria. **Figure 3** is a visualisation of this data, represented in radar graphs, demonstrating strengths and weaknesses. *Sleepybelly* and *momcozy* tie with the highest score (37/40), performing perfectly in quality, positioning, reputation, and features. Pricing is the common fault as they are both expensive.

There is a three-way tie in second place (31/40) for *the memo*, *bumpnest*, and *LoveLittleOne*. *LoveLittleOne* and *bumpnest* are very similar products with slight variation in size and customisability. They both rank very similar in all sections except for reputation and price, with the memo performing poorer in price as well as technology. The remaining five products are ranked lowest as they perform worse in the majority of categories except for price.

Product	Quality	Pricing	Technology	Style	Positioning	Service	Reputation	Features	Total - 40
Sleepybelly	5	3	5	4	5	5	5	5	37
the memo	4	3	3	4	5	4	4	4	31
bumpnest	5	2	4	4	5	3	4	4	31
Ovela	3	5	3	3	3	4	4	4	29
BabyBunting	4	5	2	3	3	4	4	4	29
Pain Free Aussies	3	5	2	3	3	3	3	4	26
Kmart	3	5	2	3	3	4	4	4	28
BabiesMart	3	4	2	3	3	3	2	3	23
momcozy	5	4	4	5	5	4	5	5	37
LoveLittleOne	4	4	4	5	4	3	3	4	31

Table 1: *Popular Pregnancy Pillows in the Market. (See Appendix B2 for full criteria information).*

1 = Weakest Performance
5 = Strongest Performance

Price is an important factor of all pregnancy pillows regardless of performance. Mothers are desperate for sleep and want something that works. They're also aware these pillows are something they'll need for a short time, so it's illogical to buy something expensive. Ultimately, **Figure 3** reinforces that there is no product that performs perfectly. It shows there was a direct correlation between price and quality. Brands either commit to quality and falter in price, or compromise quality to be affordable.

Comparing Pregnancy Pillows

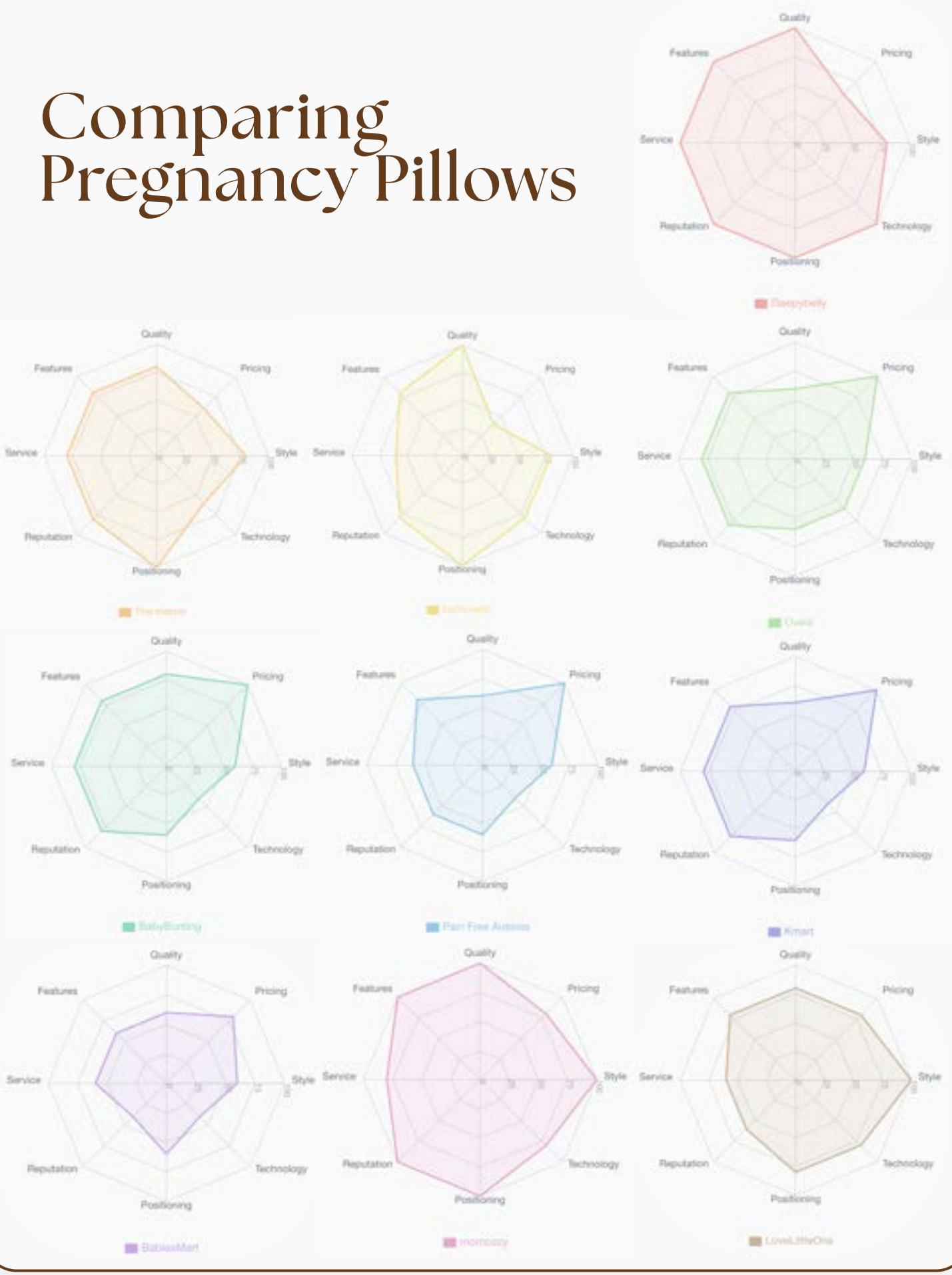


Figure 3: *Side-by-side Comparative Radar Graphs of Popular Pregnancy Pillows.*

Weighted/Blackout Eye-Masks.

Product	Quality	Pricing	Technology	Style	Positioning	Service	Reputation	Features	*Total - 40*
Goodinary	4	5	4	4	4	5	3	4	33
Neptune Blanket	5	4	5	3	5	4	5	5	36
Dore & Rose	5	3	4	5	5	4	3	4	34
Manta Sleep	5	4	5	4	5	5	5	5	38

Table 2: *Popular Weighted/Blackout Eye-Masks in the Market.* **1 = Weakest Performance 5 = Strongest Performance**

Table 2 compares weighted/blackout eye-masks against the same continued benchmarking criteria, and **Figure 4** is the visual representation of the results. Since eyemasks are a general product for sleeping assistance, these brands and products are not specific to pregnancy, they are a reflection that light plays a significant role in the influence and promotion of sleep.

Manta Sleep (38/40) is very innovative and personalisable, ranking high in quality, technology, services, and features, then faulting in the high price and clinical appearance. *Neptune Blanket* (36/40) has a simple appearance, scoring low in style, but using cooling and weighted technology, it scores high in technology and features. *Dore & Rose* (33/40) is a pricey mask without many unique features, just a simple silk blackout mask. *Goodinary* (33/40) is the cheapest but is innovative, lacking the traditional backstrap, and using pockets of weighted bead for distribution.

Similar to the pillows, there is a clear link between price and quality, obvious when a product performs well in price and worse in quality or vice versa. The main strength of these eye-masks is their technology, they all use innovative decisions to assist sleep differently.

A correlation can be drawn between technology/service and style, as seen in all products in **Table 2.** The products that perform well in the first two, are lacking in style, showing an obvious gap.

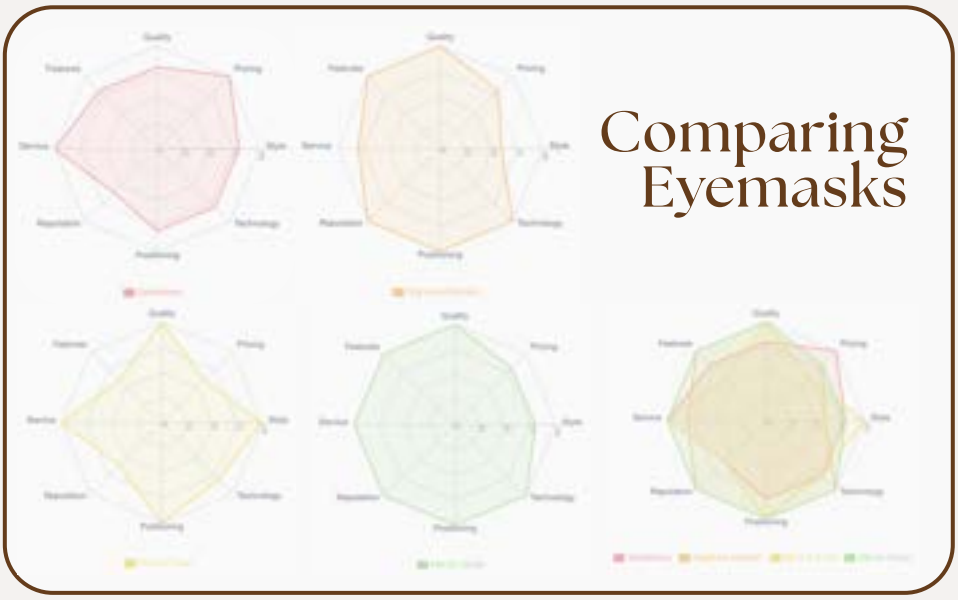
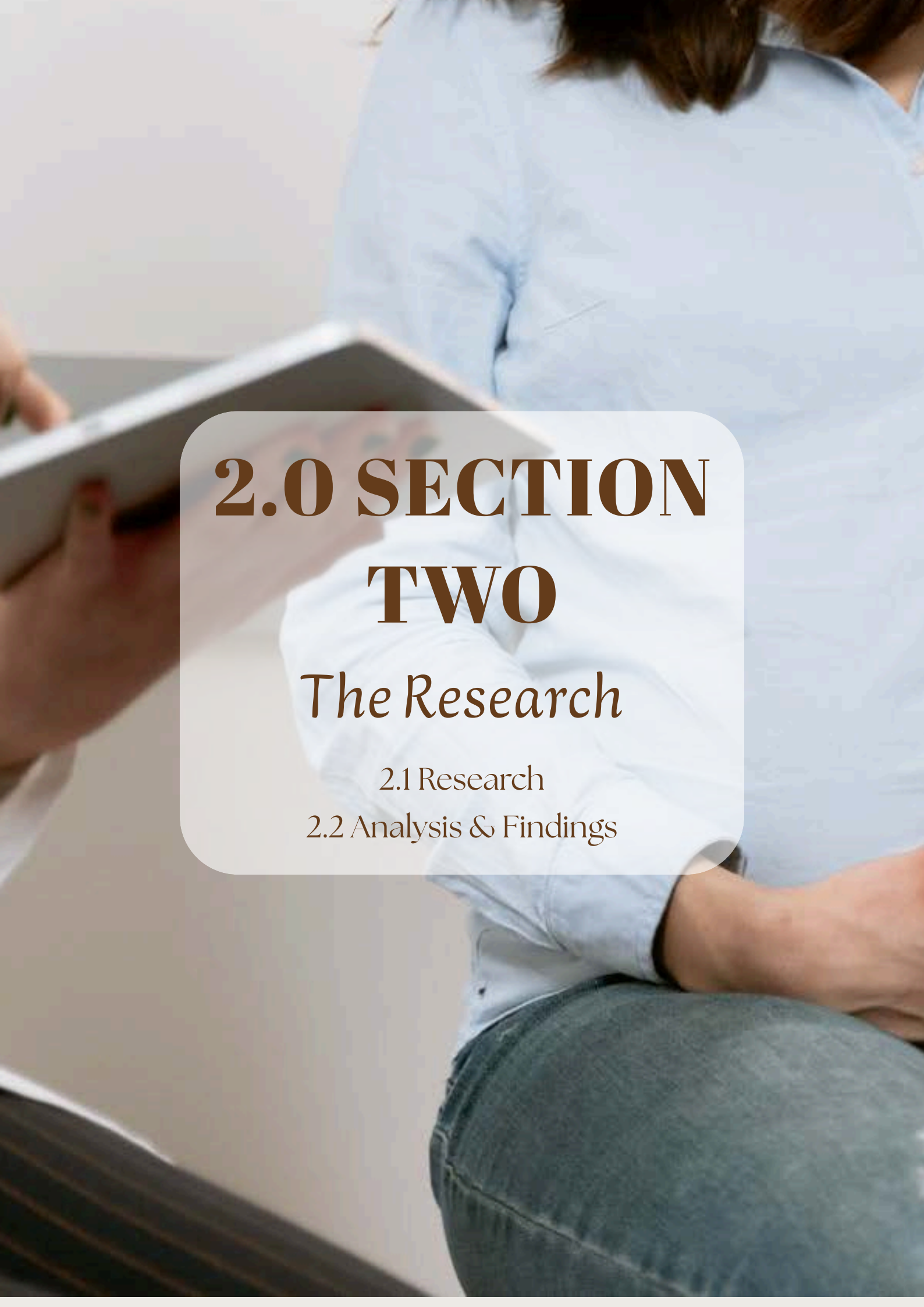


Figure 4: *Side-by-side Comparative Radar Graphs of Blackout/Weighted Eye-Masks.*

Summary.

There are so many variations of products available that assist with sleep, but are limited when it's specific to pregnancy. Benchmarking some revealed the need for products that are affordable and don’t compromise on quality. As mothers progress through pregnancy, they spend excess money on necessary items to prepare for the baby. It’s unfair that products making themselves comfortable throughout the process are expensive. Simultaneously, it’s unfair that products with proven technology and innovative services have poor style and look clinical. Mothers deserve to have their needs met, with products that are affordable, high quality, innovative, and well styled, making no compromises in the process.





2.0 SECTION TWO

The Research

2.1 Research

2.2 Analysis & Findings

2.1 RESEARCH

Primary research was conducted for insight into the personal and professional understanding of sleep during and after pregnancy, specifically exploring difficulties and solutions. All participants were provided information forms explaining why research was being conducted and what was expected, followed by consent forms they returned signed (Appendix C).

Methodology.

Soft triangulation was used, ensuring valid conclusions were drawn by understanding alternate perspectives, relying on two points to direct towards a third unknown (**Figure 5**) (Turner & Turner, 2009). This reveals how useful understanding different perspectives on the same topic can be, demonstrating why surveys and interviews were chosen. The survey had a mix of qualitative and quantitative questions, allowing participants to share first-hand experience. The interviews entailed professional experiences helping mothers through pregnancy. This triangulation has been used to gain a complex understanding, improve data accuracy and enhance research credibility (Naidu, 2024).

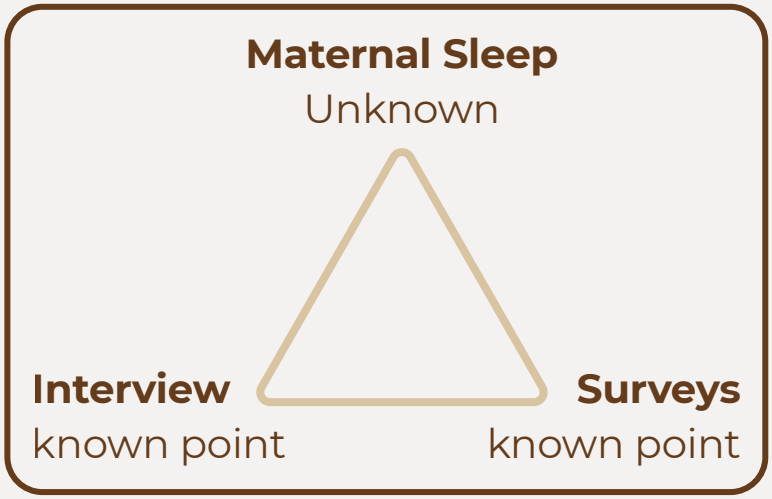


Figure 5: *Triangulation Method.*

Methods – Surveys.

Surveys are used to assess a number of responses across the same set of questions. Higher participation rates are linked to curiosity, agreeableness, and cognition (Brüggen & Dholakia, 2010). This was taken into consideration when designing the survey.



The survey was shared to mothers with pregnancies in the past four years. This time frame was chosen to limit memory bias and attempt at finding mothers with available time to complete the questions. The survey was shared on personal social media pages, as well as Reddit communities. The majority of responses were found from personal connections.

Surveys should follow a sequential and logical order allowing ease of completion. Placing quick questions at the beginning can encourage curiosity, interest, and confidence (ABS, 2018). The survey had five sections, each containing a logical sequence of questions (Appendix D). It began with closed questions about generalised pregnancy, helping participants feel comfortable and moving fast. The next section covered factors affecting sleep, followed by understanding what helped improve it. It finished with final thoughts participants may have had, or if anything was missing.

The mix of question types balanced the speed progression, allowing more time for individualised responses in the short answers. All closed questions had an 'other' option, allowing participants to add their own variation. All questions were optional for anything time consuming or sensitive to be skipped.

Due to responses being anonymous, there was no possible follow-up for answers that prompted intrigue. The final response number was low, due to mothers ultimately not having time.



Methods – Interviews.

Semi-structured interviews provide a structured approach to questioning, allowing the interviewer to freely investigate concepts that may present themselves during questioning (Adeoye-Olatunde & Olenik, 2021). This becomes valuable when topics arise that may have not been considered. Interviews for this project had a defined list of questions with various follow-ups prompts (Appendix E). Participants were industry professionals within maternal care (**Figure 6**). Their jobs provided beneficial insight into sleeping habits, expectations, and available help, all based on educated experience.



Figure 6: *Interview Overviews.*

Participant 1 Midwife



Format: Zoom

Length: 20 mins

Melita MacMahon

Midwife & Prenatal Class Instructor



Format: Phone call

Length: 22 mins

Rebecca Peat

Midwife & Child/ Family Health Nurse



Format: Phone call

Length: 33 mins

Participant 2

Midwife & Early Child Health Nurse



Format: Phone call

Length: 20 mins

Participants were provided the opportunity to ask questions before the recording started, and were informed the recording was beginning. To get participants comfortable the questions started by understanding their background. It then switched to a sleep focus, with questions for what it typically looks like during and after pregnancy. This would reveal a specific influence – either physical, psychological, environmental, baby related, or social – that the conversation would start progressing into.

Asking about current strategies was helpful, as professionals have a broad knowledge from many women, compared to mothers who have individualised experience. Once gaps were identified, participants were asked for design opportunities relevant to this project. This was repeatedly met with uncertainty, as many health professionals are unfamiliar with the innovation process. To encourage responses, examples of initial design ideas were shared to receive feedback. This provided positive reinforcement that ideas were progressing correctly. The interview finished by asking if there was anything to investigate further or avoid. This highlighted a final opportunity that was comparable in each interview.



All participants were eager and provided comprehensive answers, meaning some questions were skipped as they had previously been answered. This is a limitation of the semi-structure, as it creates difference in response order and difficulty analysing.

Ultimately, the interviews were incredibly worthwhile to this project. Industry professionals constantly observe mothers during the period of pregnancy and postpartum and have valuable knowledge that directly translates into gaps and opportunities.

Summary.

Combining these research methods provided comprehensive data from first-hand and professional experience on maternal sleep. Analysing it will reveal what mothers struggle with, and what is useful, in order to start identifying gaps that can be translated into design implications.

2.2 ANALYSIS & FINDINGS

Rigorous analysis was done to surveys and interviews to translate the data collected, into understandable evidence for later design implications.

Interviews.

Interviews are a versatile form of research providing glimpses into participants' personal experiences (Knott et al., 2022), which can reveal new opportunities. In this project's context, they provided medical insight into maternal sleeping struggles and recommendations.

Affinity diagramming was used for analysis on *Miro* (Appendix F). Transcripts were processed with concepts recorded. Codes were assigned to each participant (e.g. P01-P04), and were attached to relevant concepts with timestamps. Main themes were identified and concepts were organised. Once sorted, subcategories became obvious. Tags were assigned to post-its that had the same core concept, creating visual sub-themes within the same overarching theme (**Table 3**).

For organisational purposes the concepts were rearranged into logical groupings. Placing similar concepts with boxes to signify the same data. Concepts with identical sub-themes were side-by-side for quicker interpretation.

Theme	Tags
Physical discomfort and body changes	Hormones, support, medical, routine, mental limitations
Psychological stress, anxiety, and racing thoughts	Mental limitations, medical, hormones
Sleep deprivation becomes increasingly difficult to manage after birth due to baby's needs	Mental limitations, support, nutrition, routine, hormones, medical
Preparation and education	Mental limitations, routine, calming, support, medical
Existing support products/services	Calming, nutrition, routine, exercise, support, medical, acupressure
Gaps and opportunities identified	Nutrition, routine, calming, supporting, acupressure, exercise, medical

Table 3: *Maternal Sleeping Themes and Concept Summary.*

Findings.

It became obvious some themes had many more concepts than others, indicating strong areas for analysis. Nutrition was an unexpected opportunity and professionals identified its important role in supporting sleep at night and maintaining energy during the day. Routine and preparation also emerged, as consistent routines are associated with improved sleep, particularly during pregnancy. Things like going to bed earlier to accommodate for night waking and low stimulation activities before bed can be beneficial aspects of routines. Multiple interviews agreed on the fact that calming the body and nervous system through soothing music, gentle exercise, weighted products, and compression was an appropriate intervention.

> *"Change the eating patterns. Not having huge meals like breakfast, lunch, and dinner. More grazing meals to avoid high and low peaks of blood sugar."* (Participant 2, 2026)

> *"Prepare whilst you're pregnant. Don't think about a solution once you've had the baby".* (MacMahon, 2026)

Preparation became its own theme since it becomes so much harder once the baby arrives. This includes meal preparation, creating support networks, planning for reduced sleep and identifying strategies for sleep deprivation. Acknowledging that postpartum sleep will remain fragmented and not return to regular eight-hour patterns.

Physical barriers like sleep positions can be harder to deal with than expected, as some mothers are used to tummy or back sleeping and have to learn how to sleep on their sides for safety, which creates discomfort and difficulty settling. Gaps were identified around pelvic pain, hypermobility, and ligament-related pain, suggesting existing support doesn't address all discomforts.

> *"It doesn't suit all of them because they may have never done that before...but it's always a challenge".* (MacMahon, 2026)



Stress, worry and anxiety were prominent factors contributing to sleep disruption, specifically due to uncertainty about pregnancy. It also became evident that psychological and physical sleep barriers are interconnected which supports the idea of nervous-system regulation as an intervention.

From the professional experience of specialists it became evident that mothers will prioritise the baby's needs over their own. This feeds into sleep since mothers will feel guilty for having naps during the day and won't ask for support when it is needed, becoming dependent on the baby's temperament. Any postpartum interventions needs to consider opportunities for the mother to rest without worrying about the baby.

> *"Everything gets focussed on the baby's sleep problem, not so much the mother".* (Participant 2, 2026)

There was no overarching solution, it spanned medical, physical, behavioral, psychological and educational approaches. These zoomed into iron treatments, topical magnesium, acupressure, exercise, and compression products, as well as antenatal care, mothers groups, osteopathy, and other health services.

Surveys.

Eleven responses were exported from Google Forms into Google Sheets for analysis. Due to small sample size, analysis was done manually in Miro using individual colours corresponding to each participant (Appendix G).

Quantitative responses were analysed using frequency counts and percentages to identify prevalence of responses and compare. Multiple selection questions were separated and counted individually. Percentages were not expected to total 100% for multiple selections. Qualitative responses were analysed using thematic coding and affinity mapping. The written responses were broken up into concepts to spread the data further. Codes were assigned to concepts and were organised into themes.

Analysis was performed by cross-comparing questions to identify relationships and contrasts. Pregnancy and postpartum responses were compared to understand how sleep disruption changes through the transition to motherhood.

Findings.

It is important to note that more than half the sample group gave birth over 12 months ago, they are recalling experiences that may have memory bias. Whilst this is a limitation, over half had given birth multiple times, meaning research is not solely based on first time mothers.

Overall, sleep quality was poor during and after pregnancy (**Figure 7**), with 63.6% (7/11) selecting poor or very poor. This clearly establishes that disrupted sleep was a significant experience within sample participants. Looking further into the difference between the two, 54.5% (6/11) reported very or extremely difficult sleep difficulties during pregnancy, which was directly mirrored with the same after the pregnancy period. Whilst the percentage stayed the same, qualitative responses show that the causes of sleep disruption changed between these stages. Throughout all stages of pregnancy and postpartum, the third trimester was identified as the most difficult period to manage sleep (**Figure 8**) at 54.5% (6/11), giving evidence that later pregnancy should be a focus.

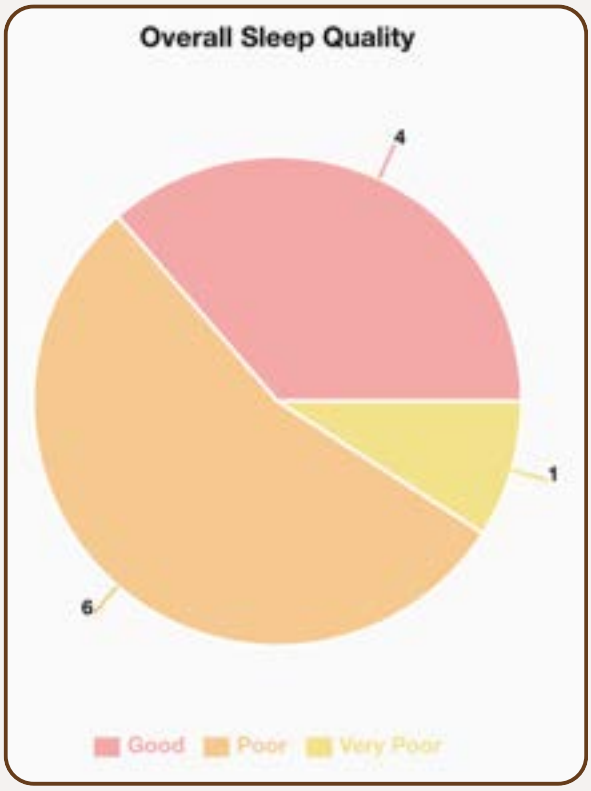
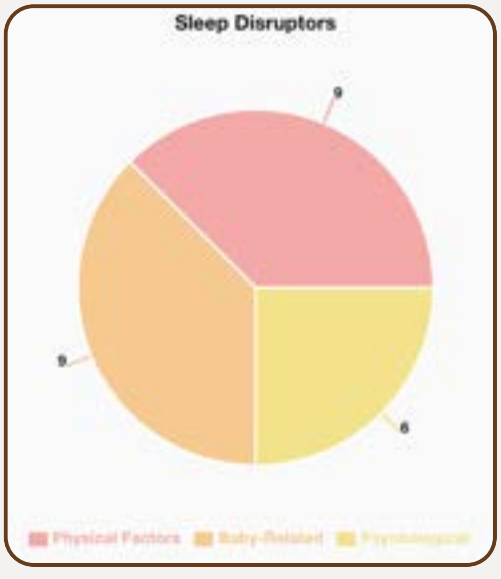


Figure 7: *Overall Sleep Quality of Survey Participants.*



Figure 8: *When Sleep was Experienced the Worst.*



The most common sleep disruptors were physical and baby-related factors, both at 81.8% (9/11), followed by psychological factors at 54.5% (6/11) (**Figure 9**). Open responses identified issues including heartburn, nausea, back/hip pain, muscle discomfort, leg cramps, bladder discomfort, reduced mobility, and difficulty finding a comfortable sleeping position, showing that physical discomfort was not an isolated problem.

Figure 9: *Sleep Disruptors.*

The source of sleep disruption changed across motherhood (**Figure 10**), as pregnancy was characterised by physical discomfort, and postpartum responses shifted toward baby responsibilities. Psychological factors were found to continue across both stages.

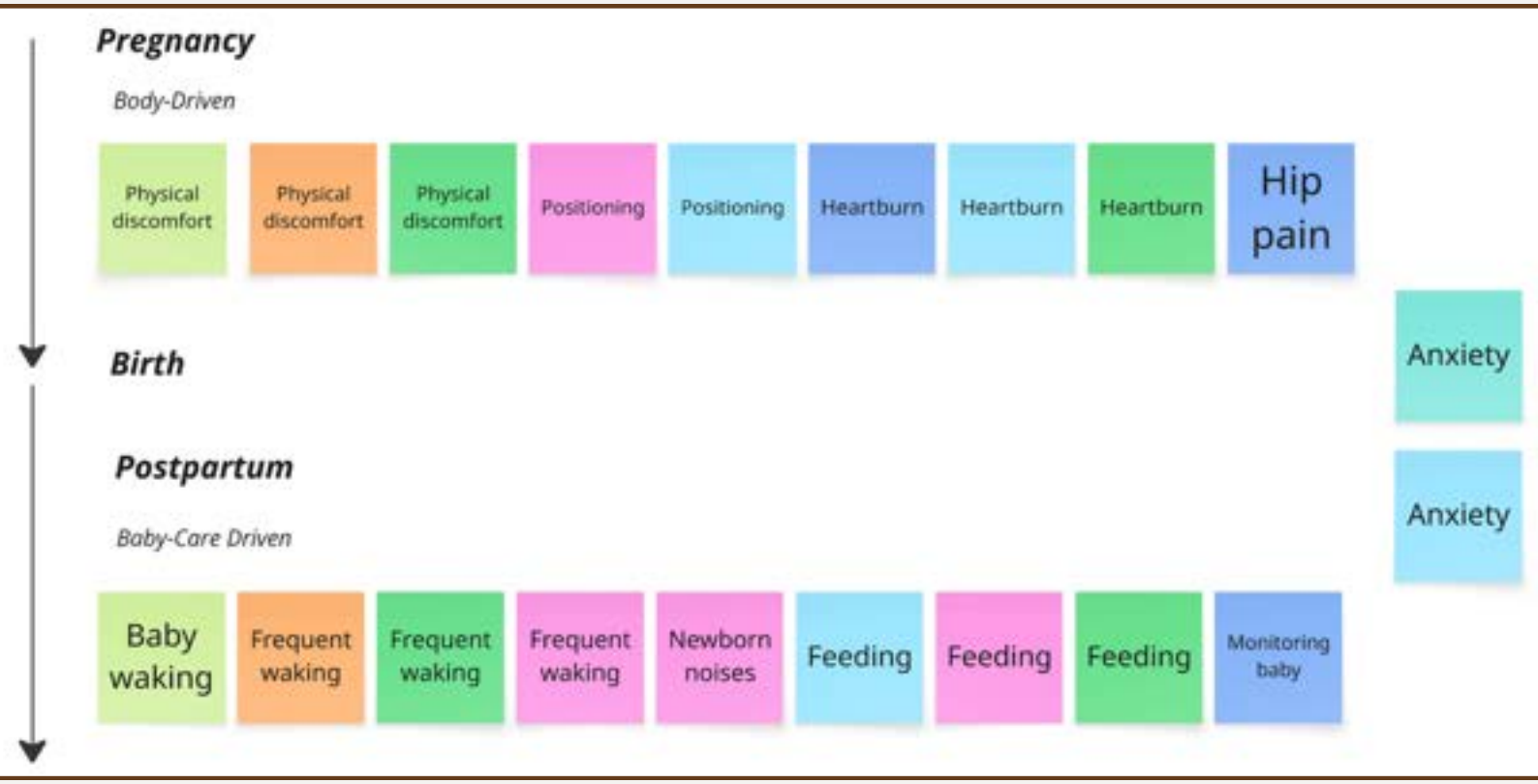


Figure 10: *Sleep Disruption Transitioning Through Motherhood.*

The most common strategies used to combat sleep struggles were pregnancy pillows at 63.6% (7/11), exercise/physical activity at 54.5% (7/11), 54.5% (6/11) for adjusting the room temperature, and 27.3% (3/11) for using magnesium and prescribed medication (**Figure 11**). Participant explanations suggest that pillows addressed support/positioning issues, cooling addressed environmental temperature, exercise assisted physical or mental fatigue, and medication addressed symptoms of pain. Highlighting there was no universal solution.



Figure 11: *Strategies That Assisted With Sleep*

Analysis revealed a contradiction around pregnancy pillows. They were one of the most commonly used strategies (63.6%), however, participants identified faults in existing pillows like cost, availability, positioning and difficulty addressing several physical symptoms simultaneously. Responses also identified needs for professional therapies, symptom management, practical maternal guidance, and social support. This final section of the survey reveals that maternal sleep is affected by a system of factors.

Summary.

Completing these analyses reveals gaps and opportunities from both perspectives of research. Some concepts were mentioned in interviews but never in the surveys, placing a value on obtaining industry perspectives with insight that mothers are oblivious too.



3.0 SECTION THREE

The Discussion

3.1 Discussion

3.2 Design Implications

3.3 Conclusion

3.1 DISCUSSION

The primary and secondary research completed for this project has clearly highlighted that sleep is crucial in the process of having a baby, and that mothers continuously struggle with it through all stages to postpartum. It was heavily shown that since women still deal with such difficulties there are not enough quality solutions available to manage symptoms of tiredness and to encourage sleep. There is a market of existing products, however, very little have been designed with a pregnancy focus, most follow general insomnia and broken sleep patterns. Since humans are so unique there will never be the perfect product that can create better sleep for everyone, there are too many individual factors that contribute to sleep patterns. The best that can be done is understanding the underlying problems that lead to poor sleep, and finding a solution that helps manage it – not fix it.



Market research highlighted that existing assistive products are expensive, good quality, and look clinical, or they are cheap on quality and services, so they're affordable. There's no inbetween that offers a covering of all, so mothers are forced to decide if they want something affordable that looks nice but might not have many innovative offerings, or something that is expensive and looks clinical if it works well. Survey results reflected this need as many responses stated similarly that they just wanted "better pillows that weren't expensive", as an example of one product.



It was a previous understanding that exercise was beneficial for pregnancy (Liu et al., 2025), but throughout this research it became clear just how much of an impact it can have on improving sleep. Mothers commented on it making a difference from first-hand experiences, and health-care professionals spoke about often recommending it.

As the body grows it becomes difficult to move, so gentle exercise is a necessity to keep the body and baby healthy. There are limited to no solutions that help with this process and mothers are left stranded with the knowledge that they should be doing something but don't have the resources to do it.

The original research direction focussed on physical solutions to assist with feeling more comfortable in bed, primary research used this as a starting point and revealed a much broader system that expanded the design understanding of what is possible for this project.



3.2 DESIGN IMPLICATIONS

A combination of the primary and secondary research identified will be used to inform opportunities and translated into design implications.

Getting prepared during pregnancy was the biggest opportunity revealed in interviews. Devoting time to plan and understand what life after a baby will look like is the only successful way to get through it, once the baby arrives, the time for planning has passed. Once broken sleep is expected, routines are the appropriate intervention. Creating a routine surrounding a nighttime, wind-down environment opens up the opportunity for design.

Anything that involves continuous daily interaction and promotes a calming, low-stimulation setting can be a part of this routine. Getting into bed earlier to allow for more wakings was identified as an opportunity, so products that live in the bedroom or close to the bed and allow for minimal movement from a sleeping position to remove sleep anxiety would be seen as beneficial.

There is limited guidance for exercise during all stages of pregnancy. An interview suggested mother groups participate in weekly pilates or guided courses, this is a starting point.

Once mothers get to a certain stage in pregnancy it gets harder to do independent outings. There is already so much psychological stress and anxiety surrounding pregnancy that unconsciously impacts sleep, and using exercise equipment that is not designed for pregnancy adds worry that mothers should not be expected to deal with. Women typically refer to gym balls or walking, as they're both gentle and cost effective, but there is an obvious opportunity to design something that can be used at all stages of pregnancy through to postpartum that encourages independent, gentle movement in a universal way that can either be used at home or on the go.



Nutrition emerged as an unexpected theme of significant importance. Mothers should have the diet of a toddler and "graze throughout the day" (Participant 2, 2026), so having a system that allows food to be kept close by at all times is an easy way to promote sleep. Mothers were found to often wake during the night due to hunger, so continuing the grazing expectation through the night is also an opportunity. Having quick access to food during the night that encourages sleep, not only feeds the hunger, but helps in the process of returning to a deeper sleep.



Physical discomfort is the last and very obvious issue that was raised through independent research, interviews, and surveys. Not many solutions have been found to help with things like morning sickness, nausea, RLS, and pelvic pain, because they are an expectation and mothers are expected to put up with them. Surveys highlighted that the products that do exist do not fully fill the need for discomfort support leaving a gap in the market and an opportunity for further design.



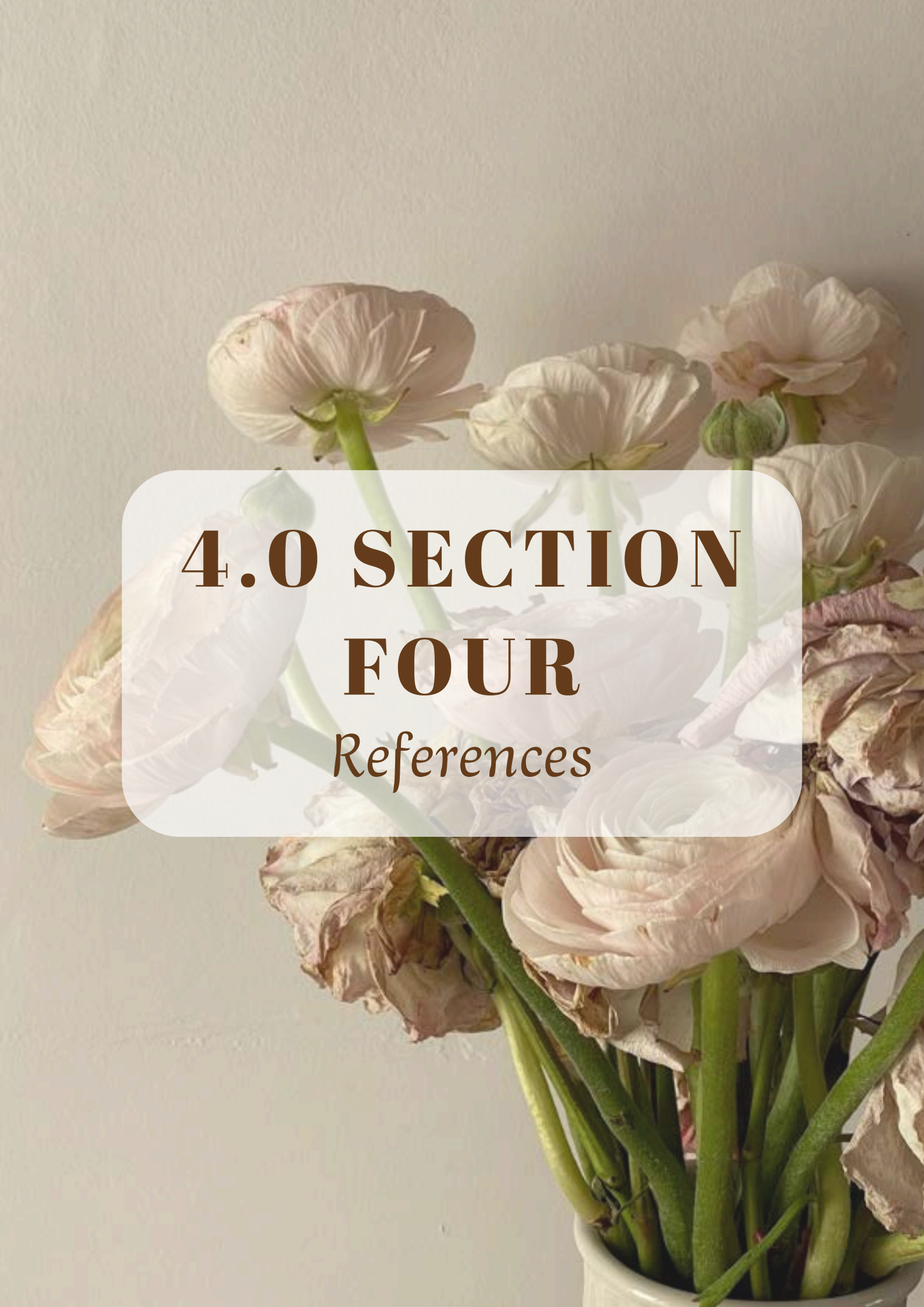
CONCLUSION

This report has proven beyond a doubt that disrupted sleep during pregnancy and after birth is a continuously negative experience for mothers that can have drastic effects on all aspects of health. Since this has been an ongoing struggle for centuries, mothers have come to accept that poor sleep comes with the territory of pregnancy and don't seek help or look for assistive products – as they typically aren't available. Existing sleep assistive products are generalised and often miss pregnancy related symptoms.

No single product is expected to solve every mothers sleeping issues. The aim of this report was to identify the foundational issues that lead to poor sleep and to find opportunities that address these problems. Secondary research was used to provide a background understanding of the issue as a whole and primary research was used to reaffirm and get first-hand experience of the biggest contributing factors and solutions to disrupted sleep.

Healthy sleep is a fundamental human need. Women spend nine months growing and carrying another human being, followed by a lifetime of caring for them, their own rest and wellbeing should not become secondary in the process. Mothers deserve sleep solutions that are accessible, affordable and designed with their changing needs in mind. Moving forward, the priority is clear: develop practical and adaptable solutions that support mothers throughout pregnancy, birth and beyond, because caring for a baby should not come at the cost of caring for the mother.





4.0 SECTION FOUR

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4.1 REFERENCES

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