Understanding the barriers and enablers of babywearing using the COM-B model and the theoretical domains framework

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Research Paper

Understanding the barriers and enablers of babywearing using the COM-B model and the theoretical domains framework☆

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ABSTRACT

Research suggests that 'babywearing' (the use of slings, wraps, and carriers) can have beneficial effects on the quality of parent-child attachment, maternal well-being, paternal responsiveness, breastfeeding behaviour, child mood, and child sleeping patterns. Recently, there has been a growth in the popularity of babywearing, but reports suggest there are significant challenges in engaging and maintaining the practice. This research used qualitative methods and concepts from behavioural science (the Theoretical Domains Framework and the COM-B model) to investigate the psychological, social, cultural, economic, and logistic factors that mothers perceive as barriers and enablers in relation to babywearing. Seventeen mothers with experience of babywearing were interviewed. They reported both positive and negative aspects of babywearing, and many factors that made babywearing easier or more difficult. Notable issues including access to babywearing equipment, access to training and support, difficulty/ease of use, convenience/empowerment relative to other baby transport solutions, physical capacity, and social pressure/support. The findings provide a rich social, motivational, and behavioural description of the factors that influence people's decision to babywear and suggest several approaches that baby-wearing advocates could use to support their work.

Babywearing refers to the use of carriers that hold a child close to an adult's torso as a means of transporting children. Babywearing has been a consistent practice in cultures across the world since prehistory, but was largely replaced by the use of prams in Western countries, first by the middle classes and then more broadly, across the 18th and 19th centuries (Toth Stub, 2017). Recently, however, there has been a resurgence in babywearing practices in the West (Miller-Reynolds, 2016). Such practices are often linked to attachment parenting (Sears & Sears, 2001; Wildner, 2012) – an overarching parenting philosophy that encompasses proximal parenting care beliefs (e.g., co-sleeping and parental responsiveness; Little et al., 2019) and beliefs about the benefits of breastfeeding.

There are many kinds of carriers, which might be used from birth until a child's third birthday or beyond. Common types include stretchy wraps, woven wraps, "meh dais" (or "mei tais"), buckle carriers, and ring slings (Knowles, 2016). Each may be found to be more or less practical depending on the characteristics of the adult, the child being carried, and the context in which they are being used. While direct research on the effects of babywearing is limited, there is some research that it could have beneficial effects on the quality of parent-child attachment, maternal well-being, paternal responsiveness, breastfeeding behaviour, child mood, and child sleeping patterns (Grisham et al., 2023; Norholt, 2022).

Research also suggests that verbal interactions increase when parents can see their children, which is important given that increased use of language is strongly associated with children's cognitive and social development (Hart & Risley, 1995). For example, when parents used inward facing prams/buggies they interacted with their children 50 % more than parents using prams/buggies that face outwards and away from them (Zeedyk, 2008). As front-carry babywearing (where the child is facing the chest of the adult) encourages face-to-face contact, arguably more so than the use of buggies, the practice may have similar positive effects for the level of interaction between caregiver and child. Further research looking specifically at back-carry babywearing (where the child is facing the back of the adult) found that this was associated with more speech in both adults and children compared to pram use (Mireault

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et al., 2018), as well as more visual engagement with the environment, which suggests that proximity is also important.

The strongest evidence to support the practice of babywearing comes from research on its effect on attachment and attachment-related behaviours. In a foundational study, Anisfield et al. (1990) randomly assigned mothers to a babywearing intervention designed to promote physical contact with their child. Three months into the study, mothers in the intervention group were more vocally responsive to their child during a play session. At 12 months, Ainsworth's "Strange Situation" assessment of attachment style indicated that the children in the intervention group were more likely to be securely attached. Other studies have since replicated and extended the finding that babywearing is associated with attachment and attachment-related behaviour. For example, Williams and Turner (2020a) carried out a mixed-methods study with low-income adolescent mothers in the USA. Half were randomly assigned to a condition in which they were given a carrier and trained how to use it with their babies (2-4 weeks old). At 7-months old, babies in the carrier condition were more likely to be rated as showing secure attachment and less likely to be rated as showing disorganised attachment. Further, the amount of sling use correlated positively with secure attachment and negatively with disorganised attachment. The study also suggested that mothers who wore their babies felt that the practice enhanced bonding with their child, helped calm the child when distressed, promoted their child's development, and was convenient. Another intervention study found that fathers in a babywearing condition had increased amygdala response (measured by fMRI) to infant crying compared to fathers in a control condition (Riem et al., 2021). Given that a positive caregiver relationship and a secure attachment style are associated with health (Pietromonaco & Beck, 2019) and wellbeing (Wei et al., 2011) across the lifespan, these findings suggest that babywearing may be more than just a convenient method of transportation.

A recent synthesis of the evidence on the biological and behavioural effects of babywearing on mothers and infants confirms the benefits of babywearing, including developing secure attachment, facilitating child language development, reducing child crying and fussing, facilitating breastfeeding, and improving maternal mental health (Grisham et al., 2023). The 29 studies in the review included experimental, quasi-experimental, randomised controlled trials, mixed method, and qualitative descriptive studies. The quantitative studies in the review focused on a limited number of outcomes/benefits of babywearing and do not fully explain the complex relationship between the factors that facilitate or hinder the ability of mothers and children to experience and accrue the benefits of babywearing. As with any complex behaviour, babywearing is likely to involve an intricate array of factors that need to be understood in a holistic way (Michie et al., 2011). Just five studies in the review used qualitative methods to explore babywearing. Although these studies add to the literature by exploring wider experiences of babywearing, they lack a strong theoretical framework that enables a comprehensive understanding of the multiple interacting factors that influence and determine the behaviour.

In particular, more research is needed to understand the interacting factors that impact the decision to first initiate and then maintain babywearing. In this respect, the COM-B model of behaviour is a potentially useful framework (Michie et al., 2011). The COM-B model is a comprehensive model for analysing human behaviour and behaviour change. While initially used in the context of health behaviour interventions, the model has also been successfully used in many other contexts (e.g., Hickman, 2021) and can provide a framework for both quantitative (e.g., Keyworth et al., 2020) and qualitative (e.g., Rahman et al., 2021) studies. It suggests that behaviours are a consequence of an interaction between an individual's *capability* (e.g., knowledge, skills, physical fitness), the *opportunity* to engage in the behaviour (e.g., cultural norms and cost/availability of resources), and *motivation* to engage in the behaviour (e.g., intentions and emotional responses). Each of these three factors can be separated into two types: psychological and physical capability, social and physical opportunity, and reflective and automatic motivation. The COM-B model lies within the theoretical domains framework (TDF; Cane et al., 2012), which includes 14 domains that can be used to categorise the processes that relate to the three COM-B components in more detail. For example, psychological capability encompasses the domains of knowledge; cognitive and interpersonal skills; memory, attention, and decision processes; and behavioural regulation.

The COM-B model can be used to understand influences on behaviour to develop interventions (Kalantari et al., 2024) or used to assess the effective components of existing interventions (e.g., Paterson et al., 2024). For example, Paterson et al. used the COM-B framework to review 23 interventions designed to support physical activity behaviour in people with stroke. They found that interventions that included two or more elements of COM-B were more likely to be effective than those that just included one, and that there was strongest evidence for interventions that incorporated capability *and* motivation. In this context, such interventions might include both education on the importance of physical activity (psychological capability) and goal setting (motivation).

In relation to babywearing, while existing studies have not applied COM-B, they often focused on, or included reference to, individual components of the model. For example, a study by Whittle (2019) looking at the mobility affordances offered by carriers describes some of the motivational aspects of babywearing behaviour, including the value of slings from a practical (e.g., facilitating getting around and working flexibly with children's needs) and affective perspective (e.g., managing child's emotional state and supporting parental mental health). Williams et al. (2021) carried out a study with a sample of babywearing nurses in an intensive care unit. They found that nurses reported the same kind of motivation-related advantages of babywearing as Whittle (2019), including adult multitasking (having hands free to complete other tasks), consoling infants (calming and physiological regulation), and building caregiver-infant trust. However, they also reported some barriers, including insufficient education (psychological capability) and hospital protocols about spreading infection (social opportunity). Another study by Williams and Turner (2020b) involved interviews of mothers up to 6-months postpartum. Some had been assigned carriers to use as part of an experimental trial, while some in the control condition had opted into carrier use. Again, mothers reported being motivated to use carriers due to benefits such as convenience, the opportunity for bonding, the calming effect of carrier-use, and also beliefs about carrying as being good for the infant's development. Barriers to using the carriers that were described include the infant disliking the carrier (perhaps best understood as a form of automatic motivation within the dyad [mother-child] using the sling) and pain/discomfort (physical capability).

Given that babywearing involves close physical proximity to a child, this overlaps with the practice of skin-to-skin care. It may, therefore, be useful to consider the results of a systematic review of barriers and enablers of kangaroo care, of which skin-to-skin care is a major component (Seidman et al., 2015). This identified many factors that align with various aspects of the COM-B model. Enablers included ease of practice and prior knowledge (capability), social support and access to staff and training (opportunity), and feelings of attachment and empowerment (motivation). Barriers included lack of training and hindering health conditions (capability), disapproval from community and difficulty accessing the facility (opportunity), and pain/fatigue/anxiety (motivation). While the barriers and enablers identified in this study are a useful starting point, they cannot fully be applied to babywearing more generally. For example, skin-to-skin babywearing is just one aspect of kangaroo care programmes and, unlike babywearing more generally, kangaroo care is a health care intervention that takes place within a supported medical context specifically for at-risk neonates.

In sum, the empirical literature indicates many factors that might serve as barriers and enablers within the COM-B model. This suggests

that the model could be a powerful tool for developing a more comprehensive understanding of babywearing behaviour. Some things that one might consider include the physical ability to wear a child (e.g., strength and the absence of impeding chronic health conditions) and the technical skills that need to be learnt to successfully initiate babywearing (capability), the availability of carriers and the presence of a community where wearing is a social norm (opportunity), and the interaction of practical and affective outcomes that arise from babywearing (motivation).

1. Study aims

The existing research on the benefits of babywearing for both caregiver and child suggest it can be thought of as a behaviour that should be encouraged. However, understanding of the complex network of interacting psychosocial processes that influence the uptake and maintenance of babywearing is largely unknown. As such, this research will use the COM-B model and the TDF to investigate the psychological, social, cultural, economic, and logistical factors that mothers perceive as barriers and enablers to babywearing. In particular, the research aims to shed light on mothers' experiences as they become aware of, and familiar with, slings and use them in their everyday activities (capability); how mothers negotiate cultural norms, social support, and access to physical resources around babywearing (opportunity); and mothers' beliefs related to the practice of babywearing in terms of convenience, emotional and physiological regulation, and bonding (motivation). The study has the potential to contribute to interventions to promote and establish babywearing behaviours so more caregivers and children can experience the benefits the practice can bring.

2. Method

2.1. Methodology and philosophical underpinning

A qualitative approach was adopted due to the exploratory nature of research questions and the desire to reflect the complex sociocultural context in which parenting occurs. Critical realism was the guiding philosophical framework. Critical realism claims that experiences of the world are shaped by relatively enduring biochemical, economic, and social structures. However, these structures do not determine reality but make some constructions of the world more readily available (Parker, 1992). Perceptions of reality are shaped by sensory perceptions and sense-making that are partial and imperfect, making it possible for people to understand and experience the same phenomenon in different ways, based on subjective interpretations of complex cultural and social factors (Sims-Schouten et al., 2007). The ontological perspective of the present research, therefore, recognises a "real" world but acknowledges the impossibility of describing objective reality. Thus, the knowledge presented from this study is positioned in a way that is congruent with epistemological relativism (Danermark et al., 2005).

2.2. Positionality

This study was conducted by two researchers and lecturers in psychology, both employed at UK universities at the time of data collection. We are both heterosexual fathers who actively practiced babywearing within our families and are deeply engaged in parenting, with Author 1 being a father of two children and Author 2 a father of three. Our shared personal experiences with babywearing and fatherhood have significantly shaped our interest in the topic and our empathetic engagement with participants. For example, our familiarity with the physical and emotional demands of babywearing allowed us to connect with participants' narratives, particularly when they spoke about feelings of "bonding" with their child or fatigue during carrying for extended periods. In Author 2's case, early frustrations with finding the 'right' sling influenced an awareness of practical barriers fathers face.

While both of us would be broadly categorised as middle class by current occupation and income, we acknowledge the nuanced differences in social backgrounds. Author 2 identifies as having a working-class upbringing, a factor that informs his sensitivity to issues of class, traditional gender roles, and cultural framing in parenting practices. These personal histories inevitably influence how we interpret and relate to the data, particularly in terms of how practices like babywearing are positioned within different social and cultural contexts. Author 2 conducted all the interviews with participants and data were analysed collectively. Our roles as academics, along with our lived experiences as fathers, position us as both insiders and outsiders in relation to mothers who participated in our study. Our position as male researchers who also engaged in babywearing sometimes prompted participants to reflect on their own partners' involvement in caregiving, occasionally drawing comparisons or expressing surprise at our level of engagement, which may have influenced the depth or direction of some responses.

While our academic training supports critical analysis and reflexivity, our personal commitments to babywearing and involved fatherhood may predispose us toward certain values or interpretations. We have aimed to remain critically aware of these perspectives throughout the research process, engaging in reflexive dialogue with each other and continually reflecting on how our identities and assumptions may shape our methodological choices, data collection, and analysis. For example, our shared value of close physical contact as a parenting philosophy may have led us to interpret babywearing as an attachment-oriented practice, which we actively sought to interrogate during the interview and analysis process. By making our positionality explicit, we hope to enhance the transparency and trustworthiness of our study and acknowledge the situated nature of all qualitative inquiry.

2.3. Participants

We invited people to take part in interviews via adverts posted on UK-based online babywearing communities. Naturally, the people who are active on such sites tend to be enthusiastic babywearers. To gain a more nuanced perspective on babywearing, we also did purposive snowball sampling to seek out additional participants whose experiences were more ambivalent. While there are many men who babywear and belong to these communities, we limited participation to mothers to create a focused data set and homogeneous sample.

Seventeen mothers took part in the study, and 14 provided demographic information in a pre-interview survey. Of those, one was 25–29, three were 30–34, six were 35–39, and four were 40–44 years old. Twelve identified as White British, one as White Other, and one as Mixed (White/Middle Eastern). All participants were cisgender, and all were living with a male partner who also had parental responsibility for their children. Three had 1 child, nine had 2 children, and two had 3 children. The youngest child in each family ranged from 7 weeks to 4 years old; the oldest child in each family ranged from 4 months to 8 years old. Participants reflected on either their current use or past experiences of babywearing depending on the age of their children.

Most participants in this study were engaged in parenting communities centred around attachment-based practices and often accessed babywearing sling libraries. These are community-based services that provide parents and caregivers with access to a variety of baby carriers and slings to try out and borrow. Run by trained volunteers or professionals, sling libraries offer one-on-one support, fitting advice, and demonstrations to help families find a carrier that suits their needs, lifestyle, and baby's developmental stage. Based on participants' self-disclosures during interviews, and the communities from which they were recruited, it was evident that the majority were from middle-class backgrounds. Many held university degrees and described parenting in contexts that suggested financial stability and access to resources such as sling libraries, parenting groups, and flexible work arrangements. Geographically, participants were spread across various areas of the UK,

including urban, suburban, and relatively rural settings. Several participants referenced parenting in areas with visible babywearing communities, such as Sheffield, Bristol, and London. The sample lacked socioeconomic and cultural diversity, which we reflect on further in the discussion section. All participants were cisgender mothers in heterosexual relationships and were cohabiting with male partners. Most mothers were still actively babywearing, but some were reflecting retrospectively on their earlier experiences. In all cases, the accounts were based on personal lived experiences of babywearing.

2.4. Procedure

After institutional ethical approval, participants were sent a brief survey that asked about demographic details, and which included information about the study so that they could provide informed consent. Following this, data collection took place online via video conferencing software. The interviews were semi-structured, and all were carried out by Author 2, an experienced qualitative researcher. The interview guide was designed to enable participants to give a broad overview of their experience of babywearing, with additional questions designed to enable the interview to explore the component of the COM-B model; for example, how did they typically use carriers in their day-to-day life / were there any factors that promoted or limited their use (Capability), what kind of support did they get (Opportunity), and how did they get into babywearing / what did they perceive as the benefits of babywearing (Motivation) (the full interview guide is presented in Appendix 1). While each interview follows a broad structure, there was frequent use of probing questions to encourage participants to elaborate and encourage them to share their individual lived experience. Interviews lasted approximately 45-60 minutes.

2.5. Data analysis

We created a data coding framework before starting to code data. This consisted simply of the 14 aspects of the TDF broken down into the three major divisions and six subdivisions of the COM-B model. Following this, we added comments to transcripts as part of a line-by-line open coding process. Codes (brief descriptions of the data that were seen to connect with the COM-B model) were then allocated to the most relevant area of the framework. Coding began on early interviews while subsequent interviews were still being conducted. This enabled the gradual refinement of the coding framework across multiple iterative stages. Both authors were equally involved in data analysis and this collaborative and reflexive approach recognised our shared awareness and engagement in the topic.

In the first stage, both coders read four transcripts and created codes independently of each other. There was then a meeting where these independently generated code structures were synthesised before being added to the framework. In the second stage, coders read separate transcripts, applying the pre-existing codes where possible and making a note of new potential codes that were not encompassed by the previous code framework. After a further four transcripts were coded in this way, there was another meeting where new codes were agreed and added to the coding framework.

This process was repeated until the entire data set was coded. Both coders found fewer novel codes emerging as the number of transcripts already read increased. The decline in new codes suggested that a degree of thematic saturation had been achieved. However, a critical realist perspective recognises that meaning is shaped by deep, evolving, and context-dependent social and cultural mechanisms, thus new insights may still emerge as circumstances change (Fletcher, 2017). After initially coding all transcripts, we identified high-level themes that reflected aspects of the COM-B model, and the relationships and processes between the TDF constructs. This enabled us to create a meaningful narrative that described overall themes from the group, but also reflected the nuances of each participants' experiences. Once analysis was complete, we sent out a summary of the key findings to participants and offered the opportunity to attend a group or individual meeting to discuss their thoughts, reflect, ask questions, and feedback on the research. This process served as a form of "member reflection", allowing participants to engage with the findings and if necessary provide additional reflections and insights. Eight participants took part and all opted for an individual conversation, which was conducted by Author 2. A written overview of the findings was provided beforehand and then presented in the meetings by Author 2. Participants generally affirmed the relevance and credibility of the findings, but discussion did not result in changes to the thematic structure of the findings.

2.6. Research quality

Qualitative researchers have been encouraged to move away from checklist-based criteria for rigour and view research quality in the specific context of individual study designs and research questions (Leung, 2015). With this in mind, we used the 'big tent' criteria suggested by Tracy (2010) for judging the quality of research (i.e., worthy topic, rich rigour, resonance, sincerity, significant contribution, credibility, and meaningful coherence) but applied them to this specific context of a study on babywearing, using a behavioural science framework, in the context of critical realist philosophy.

The worthy topic was selected because of the emerging interest in attachment parenting practices and to potentially provide a significant contribution through practical knowledge that could be used to support individual parents, parenting communities, and healthcare professionals. Rigour was fostered by recruiting participants with the appropriate experience of babywearing. Data collection was designed to be rigorous (e.g., based on a robust theoretical framework) and ethical by being accessible, respectful, and engaging for the participants (e.g., interviews done at convenient times/ways, offer of breaks, multiple shorter interviews to acknowledge the demands mothers were facing). Rigour during data analysis involved the two authors working closely to establish shared understanding of the data and discussing analytical steps and emerging findings at every stage of the analysis process. Sincerity involved reflecting on our own positionality (e.g., reflecting on two fathers conducting research with mothers, on a topic traditionally viewed as a female domain). The study sought credibility by using thick description in the write up of mothers' accounts, the use of participant reflection to allow mothers to engage with emerging findings, and critical friends to help with our reflections on the theoretical, methodological, and philosophical aspects of the research process (Tracy, 2010).

3. Results

The study used a qualitative methodology to investigate the psychological, social, cultural, economic, and logistical factors that mothers perceived as barriers and enablers to wearing their children using carriers. Table 1 shows a comprehensive list of barriers and enablers grouped under the TDF domains. Throughout the analysis it became apparent that the mothers were actively negotiating multiple barriers and facilitators of babywearing and there was often a complex relationship between the components of the COM-B module (i.e., Capability, Opportunity, Motivation). Fig. 1 illustrates the dynamic interaction between the three components of the COM-B model as they relate to babywearing. Arrows between components highlight that these domains are not distinct, but interdependent. For example, increased Capability (e.g., improved technical knowledge) can enhance Motivation (e.g., via increased confidence) to continue babywearing, while strong Motivation (e.g., beliefs about "attachment" parenting) can encourage mothers to build their Capability. Similarly, social norms around babywearing and social support (Opportunity) can facilitate both Capability and Motivation through the process of engaging in babywearing behaviour. The factors within each COM-B component shown in Fig. 1 can act as

Table 1
Barriers and Facilitators of Babywearing.

Facilitators	Barriers
Capability	
Knowledge	
Awareness of babywearing practices / history.	Unsure how slings work.
Understanding uses of slings.	Not aware of support.
Knowledge of child development.	Poor technique.
Cognitive and Interpersonal Skills	
Help-seeking skills.	
Information seeking skills.	
Memory, Attention, and Decision Processes	
	Reduced cognitive capacity postpartum.
	Overwhelming choices of carriers.
	Lack of sleep.
Physical Skills	
Physical strength.	Physical health conditions.
	Physical demand / comfort of carrying.
Opportunity	
Social Influences	
Emotional, Informational, Tangible Social Support.	Family attitude to babywearing negative.
Partner carries / likes carrying.	Societal ideas about babywearing.
Family history of carrying (was carried as a child).	Social norms around using buggies first/foremost.
Availability of sling library.	Negative media attention.
Babywearing visible.	Disengagement from health care professionals.
Perception of norms within social groups.	Sling library stressful.
Online support.	Availability of sling library – inconvenient/infrequent times.
Environmental Context and Resources	
Money to buy slings.	Carriers expensive.
Second hand market availability from slinging community.	Carrier difficult to use, inc poor instructions.
Time to spend learning skills.	Carrying is hot in the summer.
Access to online training resources (e.g., google/Facebook/YouTube).	Availability and use of alternatives (e.g., prams).
Slings are easy to carry (vs Prams).	Limited availability of slings on the high street.
Using slings with prams based on situational demands e.g., long days out.	Not fitting in with breastfeeding.
	Need for multiple slings over time.
	Child age / weight (too heavy).
Motivation	
Social/Professional Role and Identity	
Slings as fashion items.	Babywearing compromised independence.
Kangaroo-Care.	
Alignment with middle class identity.	Perception babywearing 'cliquey'.
Belonging to a community.	
Beliefs about Capabilities	
Confidence (e.g., from training, from previous experience).	Not a practical person.
	Concerns about competence as parent.
	Lack of confidence (choosing/using).
Intentions	
Intentions to carry in pregnancy.	
Intentions to carry after birth (e.g., buying sling, spending time/money on training).	
Beliefs about Consequences (overlap with goals)	
Facilitates sleep / settling.	Interferes with some aspects of housework.
Facilitates getting child to take medicine/vaccination.	Will cause pain.
Helps reduce child's discomfort (e.g., reflux).	Worries about long term health problems (in child, e.g., hip dysplasia).
Baby emotional, cognitive development.	Worries about long term health problems (in mother, e.g., bad back).
Bonding / attachment – parents / grandparents..	
Facilitates 'getting out and about'.	
Enables valued outdoors activities.	
Is practical (multitasking/ chores).	
Has health/fitness benefits for parent.	
Improves parent's awareness of and responsiveness to child's needs.	
Regulating child body temp e.g. keeping warm & dry in winter.	
Felt protected from others e.g., reduced risk of contagion.	
Reinforcement	
Positive reaction from child – having a view, closeness, relaxing, constant movement, sleep.	Parent physical pain/discomfort.
Positive reaction in parent – sense of connection/comfort/closeness.	Negative reaction from child – wanting to come out/not wanting to go in.
Emotion	
Carrying is fun.	Intimidated / overwhelmed by 'professional' support.
Positive affect (Beautiful fabric).	Stress of trying to get sling to "work".
Positive affect (is cosy; closeness, warmth and connection/ communication).	Worries about accessing support (Support undermines perception of competence)
Positive affect (wellbeing and mental health).	Worries about safety (dropping /overheating/suffocation).
	Conflict with Parents.
	General stress of parenting.
	Feeling judged / self-conscious.
	Poor mental health after birth.
Behavior	
Experience of carrying other children.	Experience of carrying first child (challenging).
Experience of carrying first child (positive).	
Acting as an advocate e.g., providing support as a peer advisor and introducing to social networks.	

either barriers or facilitators depending on the context—for instance, high levels of social support may enable babywearing, while low support may constrain it. These interconnected influences ultimately shape behaviour, with babywearing emerging when all three COM-B components are present and interacting to positively reinforce each other. The model reflects the complex and evolving journey of mothers as they adopt and sustain babywearing practices.

Overall, the mothers were positive about their experience of babywearing, and they talked about many benefits of engaging in the practice for themselves, their family, and their child. While there was general agreement about the positive aspects of babywearing, each mother described a subjective experience grounded in the challenges and complexity of her individual circumstances and personal relationships. The account below aims to capture these experiences as mothers' babywearing progressed over time, while highlighting the relationship between COM-B components shown in Fig. 1. All the names used in the findings are pseudonyms.

3.1. Early experiences of babywearing

Mothers' Motivation for and intentions to carry their children were developed from an awareness of the practice through exposure to babywearing behaviour before or during pregnancy. The Opportunity to engage in babywearing behaviour came through social networks, and mothers often described first becoming aware of the practice through family and close friends. They may have encountered babywearing some time before they became pregnant if a close family member or friend were wearing their child. Others discussed living in a geographical area where they often saw people carrying their children. Having become aware of babywearing and interested in wearing their children, the mothers developed their Capability by conducting their own research about carrying, which developed into even stronger Motivation to wear their child. Fig. 1 shows how positive Social Influence, Norms, and Attitudes fosters Motivation for babywearing, which drives efforts to increase Capability, resulting in further strengthening Motivation via increased Confidence. This relationship is demonstrated in this quote from Lyndsey.

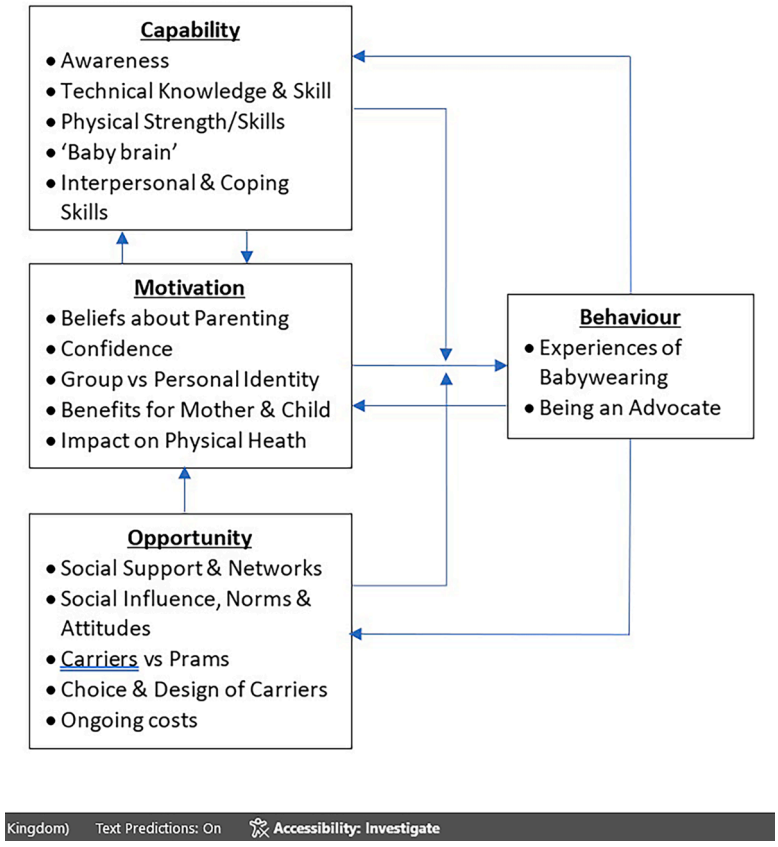

Fig. 1. Summary of barriers and enablers of babywearing.

My cousin did it a lot, she used a lot of stretchy wraps, woven wrap types and she did a lot of work with her sling library (babywearing support group) where I'm from originally, so it was just something that I'd seen. I think Sheffield as well, I mean it must be the babywearing capital…it's very visible in Sheffield. So it was something that I was definitely aware of and just did a bit of research on.

One of the strongest factors that encouraged the mothers to start wearing was tangible social support by being given a sling or carrier by someone in their social network. This reduced the need to source and select a carrier by themselves and provided a cost-free entry into the world of babywearing. Having a family member or friend endorse the practice also helped to encourage the mothers to try it for themselves. Mothers also found social support at babywearing support groups. Almost all the mothers talked about accessing a specific type of babywearing support group (often referred to as sling libraries) relatively early in their babywearing experience. These groups provided advice, training, and support on babywearing and child carrying. Mothers received information about the different types of wraps, slings, and carriers. These products are available to hire, and parents can try different types of carriers to find one that is right for them. Sling libraries are often staffed by other mothers who are experienced in babywearing and who volunteer as peer supporters to help people new to babywearing. Mothers in this study talked highly of sling libraries and shared how they helped them to understand the practical aspects of babywearing and to navigate the complexities of selecting from many different types (e.g., wrap, structured carrier) and brands of slings and carriers. This then improved their own knowledge around babywearing.

We turned up and spent about an hour and a bit there, both of us, because I think my husband had the day off on that day as well. We got loads of in-person advice on techniques and so on which just gave us confidence to go away ourselves and do it on a regular basis, and it was so helpful. (Caroline)

As discussed in the quotes above, and shown in Fig. 1, Social Support & Networks increased mothers' Capability (Technical Knowledge) and the resulting positive experiences reinforced their Motivation to continue babywearing—demonstrating a cyclical dynamic between these COM-B components.

The services offered by sling libraries were seen as beneficial by most mothers, but some described more mixed experiences. For example, the opportunity to engage in and seek support around babywearing was restricted as some libraries operated at infrequent or inconvenient times, and some participants found support difficult to access.

The sling library was only once a week and there was a lot of people for them to get through so they couldn't spend half an hour you know, going through how to put on a wrap. (Karen)

As Karen discusses, limited Opportunity constrained Capability and potentially weakened Motivation, demonstrating how deficits in one domain can influence the entire behavioural system.

Other mothers talked about their beliefs about their ability to engage in babywearing, summarised as "Confidence" in Fig. 1, and suggested they sometimes felt overwhelmed by the experience of attending a sling library or that they weren't able to take advantage of the support on offer because of how they were feeling about themselves and their competence as mothers. This quote illustrates how low confidence (Motivation) can limit use of available social support (Opportunity), even when it exists, demonstrating the complexity of the COM-B component interactions.

I think it was just so early that I felt quite under confident about it [going to a sling library], but she [Sling Library Volunteer] was

> really good, there was nothing wrong with how she was, but I think I was still yet to hit my stride as a mum. (Rebecca)

One factor that seemed to influence initial babywearing experiences, their capability to carry, and views about support, was general cognitive state early in motherhood. Some participants reported feeling like their cognitive capacity was reduced after giving birth, while at the same time being constantly tested with the demands of being a mother for the first time. There are a range of different categories, types, and brands of wraps and slings, and navigating these complex choices felt overwhelming for mothers with "Baby Brain". This cognitive overload (Capability) was often compounded by a lack of accessible or suitable Social Support (Opportunity), reducing both the ability and the drive to continue with babywearing (Motivation).

Some of the mothers doubted their abilities and competence as a mother. This lack of self-confidence could be accentuated when they encountered people within their network whom they perceived to be capable mothers. Veronica struggled with her firstborn but went on to have a great babywearing experience with her second child. Below she talks about her lack of confidence and interpersonal skills to speak her mind, and the difficulties she had understanding and talking about her thoughts and feelings when engaging with support at a sling library. In this case, compromised Interpersonal Skills (Capability) and lack of self Confidence may have reduced the effectiveness of available support (Opportunity), reinforcing her uncertainty (Motivation).

> I was kind of trying different ones, everyone was saying that I should, but I was thinking 'I'm not feeling that'. I know there was definitely one occasion I went home with a hire…and I'm thinking 'I'm not sure about this', but I didn't feel that I could say, it sounds ridiculous now, I didn't feel I could say 'I don't think that's the right thing for me'.

One of the major barriers to taking up and becoming comfortable and confident wearing their children was getting to grips with the practical aspects of putting on and adjusting slings. Several related factors were involved in these challenging experiences, including the perceptions that the design of the products was very complicated or technical, lack of knowledge about how the product worked or should feel, and lack of confidence using the products in the correct way. Some mothers acknowledged, in retrospect, that they had poor technique initially and struggled with their chosen products. Although there were some different opinions, woven wraps (one long piece of strong fabric) were considered the most difficult to use.

Confidence and capacity to engage in babywearing was negatively impacted by the large choice of carriers on the market, which was perceived to be overwhelming by some mothers. However, this variety did mean that the participants often found something that worked for them eventually. The support and information regarding opportunities to engage in babywearing came from a variety of sources: participants took advantage of sling libraries, if they were available in their area, and more informal support from other mothers at baby play groups.

> When she was about six weeks I went to a playgroup, I wandered in in the sling, and I didn't feel confident with how to do it, but I just kind of kept the knots that had been shown first time, and I went in and it was actually one of the first playgroups I went to, and everyone was like, 'Oh! A six-week old baby! How cute!'. And that was really nice, meeting other mums, and soon as I mentioned about the sling [not feeling right], there was this lovely woman who just confidently helped me get my sling together, and I just thought she was wonderful, and it was really nice. (Veronica)

The interaction Veronica describes is a good example of the reinforcing loops within the COM-B model seen in Fig. 1: engagement with Social Networks and practical Social Support from another mother fostered Confidence and facilitated desire to improve technique (Capability), which further increased confidence (Motivation) and encouraged babywearing (Behaviour).

The quote above is an example of the experience of several of the mothers. Often, motivation to engage in babywearing was reduced if they lacked confidence in their ability to use their sling or carrier. However, social support in the form of practical advice from peers increased their capability to use slings, which then bolstered their self-efficacy and the belief they could do it. The relationship between social support from family, friends, and peers and the participants' babywearing confidence is one of the most important findings of the present study. It demonstrates the reciprocal relationship between COM-B components shown in Fig. 1: as Capability increases through support, Motivation increases, which in turn makes mothers more likely to seek and utilise further support (Opportunity).

Some of the mothers who struggled with babywearing initially reported that a lack of social support acted as a barrier to babywearing. Forming relationships via things like baby play groups can take time, and participants were not always aware of where to seek support. For some of these mothers, support from online sources were very helpful. For the participant group more generally, online sources of support were useful to answer "in the moment" questions. Often, mothers said they felt like it was relatively easy to put on and adjust a sling when someone was showing and helping them, but they might then forget, or not quite get it right when they got home. In this case, they used training videos posted online as reminders, or asked a question on an online babywearing support group. Here, Charlotte talks about accessing free videos from support groups to make sure she was using her sling in a way that was safe.

> I find the resources that they have are all fantastic. I'm pretty sure that there was some guidance [on safety] through their Facebook groups and things as well, similar type of you know, checklist of things to make sure when you've got baby in a sling, how to make sure that they're safe. And then yes, in terms of finding out how to use the sling, pretty much exclusively used the sling library videos that they've done, you know the kind of pre-recorded tutorials they've got.

3.2. *Becoming a babywearer*

This section explores how mothers' early motivations for babywearing developed into a deeper sense of babywearing identity through their lived experiences. Throughout their journeys, Capability, Opportunity, and Motivation interacted dynamically, as described in Fig. 1. Positive Experiences of babywearing (Behaviour) often strengthened confidence and Motivation, which cemented Technical Knowledge (Capability) and Skills. At the same time, more challenging Experiences of Babywearing (Behaviour) could reduce or prevent progress by negatively reinforcing other COM-B components, reflecting the evolving and interconnected nature of becoming a babywearer.

Most mothers experienced challenges around babywearing initially but for the majority their internal Beliefs about Parenting (Motivation) related to attachment parenting were reinforced by positive experiences that revealed practical Benefits for Mother & Child, which positive engaged the whole COM-B system, and enabled them to transition from hesitant users to confidently Being an Advocate for babywearing. Even the women who experienced the greatest challenges overcame them and persevered with using their slings. One of the strongest factors that underpinned this was motivational processes related to identity. For almost all the mothers, their overall philosophy of parenting could be described as "gentle parenting" or "attachment parenting" (Pazella & Davidson, 2024). Broadly, this approach to childcare prioritises physical and emotional closeness and being very responsive to the child.

Participants' overall attitude to parenting combined with reinforcement from positive experiences of wearing and being close to their child served to develop and strengthen the participants' babywearing identity. Even mothers who had a more pragmatic attitude to babywearing initially became fully fledged converts. Here Emily talks about her

changing feelings about wearing her daughter.

> I had all these kind of preconceived ideas that babies would sleep in cots and be easy to put down and would sleep really well and that certainly wasn't true with my first child and she didn't like being put down. She liked to be held to go to sleep, and she was like a bit windy and stuff like that, especially in the day she didn't want to be put down. And so I started using the wrap when she was really teeny tiny and that enabled me to get her to sleep without any stress. And it was really convenient and also enabled us to be really close and I sort of went from not really wanting to use a sling if I'm honest to actually being a full-blown convert babywearing lover.

Emily's experience demonstrates how relatively low Motivation initially was strengthened by positive behavioural outcomes (e.g., soothing the baby). This reinforced her Confidence, developed technical proficiency and skills, further bolstered her confidence, and deepened her attachment to babywearing, another example of the positive feedback loops described in Fig. 1.

As in the case of Emily in the quote above, the words used to describe the experience and benefits of babywearing were often things like "close/closeness" and "bond/bonding". These were used by almost all the mothers, over and over again, to articulate the connection they felt babywearing fostered between them and their children. When talking about factors related to the benefits of babywearing, Jenny mentioned several things related to attachment parenting.

> They're close to the parent aren't they…that's just what they want, particularly smaller babies, they just want a mum, dad, familiar caregiver don't they…being close, hearing the heartbeat and familiar sounds from the womb and that kind of right temperature, you know, safe, warm space, enclosed, not too much sensory overload. We've used the sling quite a lot in that type of scenario where it was just a lot going on. And they get a bit over-stimulated and you kind of go, "Oh okay, right, well let's just have a bit of a time out".

The last part of Jenny's quote above emphasises the "responsiveness" of attachment parenting, and the ability for mothers to shield and protect their children. Similarly, almost all the mothers discussed the ability to calm their children when they were distressed, believing that close proximity and the physical connection their children got from being in a sling relieved stress and discomfort. There was an interaction with the mothers' own mental health too, further strengthening the belief the babywearing was a positive thing for their family. Several mothers discussed issues like postnatal depression and how babywearing helped to ease or reduce some symptoms. Here Emma discusses the benefits of babywearing for her own mental health.

> I had postnatal anxiety and depression after she was born and a lot of my sort of anxiety was around getting her to sleep on a schedule. And whether she was having enough sleep, the right amount of sleep and in the right way and when I started using the sling I kind of relaxed on that a little bit…that really helped with my anxiety because I knew that wherever I was she could always fall asleep.

Emma's experience highlights how successful babywearing strengthened both psychological Capability (coping skills) and Motivation by providing emotional reassurance, which supported continued engagement with the practice.

Mothers also reported that babywearing had benefits for their relationship with their partners. Involving partners expanded the social Opportunity for babywearing within the family unit, reinforcing shared Motivation and normalising the behaviour. Babywearing became part of their family identity, and this allowed fathers to bond with their child, contribute to parenting in a "hands on" way, and give the mother a break from childcare. There was a strong belief that babywearing would contribute to raising happy, secure, and confident children. Here, Lisa discusses the longer-term benefits she felt babywearing had for her daughter's emotional development.

> She's really, really, expressive and emotionally tuned in She kind of knows what's going on for her and I think I do kind of put that down to being able to do that [babywearing]…I feel like she feels very safe to tell us how she's feeling, which I think is part of that kind of bond, about being close and feeling safe.

As well as the practice of babywearing becoming part of their identity and an expression of their parenting philosophy, mothers often formed and became part of social groups that shared the same ethos. Group membership created ongoing Opportunities for emotional and practical Social Support, which not only strengthened mothers' existing Motivation but also provided new resources for building Capability (e.g., sharing techniques, swapping carriers). In essence, they were part of a babywearing "in-group" with like-minded friends from, for example, neonatal groups, online babywearing groups, and baby play groups. Group membership had the effect of supporting and strengthening shared beliefs, as well as increasing the opportunity to engage in babywearing by providing a source of social support. This social support continued to play an important role in the mothers' babywearing experience for practical reasons, like advice about using new babywearing products or buying and selling second-hand slings, but also for general emotional support and being able to share babywearing experience.

Participants predominantly came from a middle-class social group and babywearing appeared to align with the broad values and expectations associated with this group. A shared identity and membership of a high-status social group was likely an enabler of babywearing for most of the mothers in this study. For some though, the perceived class dimension to babywearing was seen as an issue. One participant, Heather, talked a lot about babywearing being perceived as a "yummy mummy" practice. Below she discusses how this may affect people from outside the babywearing "in-group".

> I do wonder for some people who may not be sort of middle-class educated and have 'hippie dippy' friends, I'm not just saying, like I count myself and my own friends a bit like that at times, but people who maybe are from a completely different background maybe look at sling-wearing as a bit niche and a bit weird and it's not for me. And I think, you know what, yes.

Heather's reflection shows how perceived social exclusion or stigma can undermine Opportunity and thus weaken Motivation, illustrating a negative feedback loop that also exists within the COM-B framework presented in Fig. 1.

One of the potential challenges of a defined babywearing identity is if the views and practice of the in-group become exclusionary. Some participants in this study reflected on times when they had judged others for not babywearing "the right way".

> I would see all these babies out with you know the [name brand sling] with this kind of tiny little thing and they'd be in these big starfish kind of suits and just, there would be part of me which is like "ohh, they're facing outwards, but they seem pretty happy". But there was a little bit of me – maybe it's like middle class smuggery – that was like "oh no, oh dear that poor baby". (Lyndsey)

As Lyndsey's reflection illustrates, strong Social Influence, Norms, and Attitudes (Opportunity) can sometimes become rigid, reinforcing behaviours within the group but inadvertently excluding or alienating others, potentially limiting broader Opportunity for engagement and reducing Confidence.

For several mothers in this study, a significant barrier to babywearing came when their parenting identity was challenged in some way. This often happened when their beliefs about parenting and the benefits of babywearing came into conflict with the beliefs of people in their close support network (e.g., grandmothers). Grandmothers were important sources of support but often had different views about parenting and were not always positive about babywearing. They

suggested babywearing was not something they had done, and they feared babywearing would lead to a "clingy" baby. Here Veronica describes a difficult conversation with her mother when she questioned the safety of babywearing.

> My mum was just kind of 'oh I, I hate it when I can't see the baby's face'. 'I know but Mum, I can see the baby's face. If there's a problem, the mum or the dad, or whoever is wearing can see the baby's face. Trust that I can. I can see the nose, the mouth, I can feel the breathing'. So yeah, that would have definitely played into it [finding babywearing difficult] I think, especially as a first-time mum.

Challenges from close family members, such as Veronica's mother, highlight how negative Opportunity (lack of Social Support) can undermine first-time mothers' Capability and Motivation, making it harder to sustain babywearing behaviours despite initial intentions.

3.3. Practical aspects of babywearing

This section explores how the practical benefits and challenges of babywearing influenced mothers' experiences and decisions through their babywearing journey. Convenience, safety, and ease of everyday activities acted as strong motivational factors, while physical health issues and prevailing social norms occasionally posed barriers. Again, described in Fig. 1, Capability, Opportunity, and Motivation interacted continuously to shape how mothers integrated babywearing into their daily lives.

All the mothers talked extensively about the day-to-day usefulness of slings throughout their experience. They described the practical benefits of being able to soothe and encourage a child to sleep while accomplishing everyday tasks and household chores. Babywearing also facilitated getting out and about and engaging in valued activities. Here Jessica summarises some of the practical aspects of babywearing that were common among the participant group.

> I feel like I can go to the places I want to go to, walks that aren't just friendly walks…the fitness classes the dance classes that I get to enjoy, that are sling based. Convenience as well, it's just inconvenient to have a pram with me, like if you went to a cafe and there wasn't space for one, for example. They could sleep in the sling a bit easier. Time as well, it's just quick like if I wanted after I might just go down the road to shopping rather than getting the pram, which actually is quite heavy and it takes some time in and out the car, I can just leave the house and put her in a sling it's easier for me.

Mothers with more than one child suggested that the practicality of babywearing empowered them to take care of all their children and boosted confidence about their capabilities as mothers. They could put their youngest child in a sling, for example, and have the physical ability and mental energy to engage with an older child. Here, the experience of safely managing multiple children enhanced mothers' perceived Capability and strengthened their Motivation to persist with babywearing as a practical parenting tool. Mary said having her younger child in a sling enabled her to keep both her children safe when they were out at playgrounds.

> He [older child] loves to run around, and I can't really use the pram for her [younger child] because he's not that great at listening. So I could just imagine him running off and having to leave her in the pram whilst I went to get him…so pretty much every time I've had them both on my own, which is literally three, four days a week, I always have her in the sling. So that if he runs into a bush or something I could go after him.

Despite extensive practical benefits of babywearing, the mothers also discussed material things that made it hard for them to wear their children, or discouraged them from continuing. Cost of babywearing equipment was not a barrier to starting the practice (likely because of demographics of the sample), but some participants suggested that continuing the practice required them to purchase new products as their child outgrew existing slings, which meant that cost did become more of a consideration. A couple of mothers did manage to master breastfeeding in slings, but a few others said this was too difficult and constantly taking babies out of slings to breastfeed became inconvenient. These examples demonstrate how limited Opportunity (e.g., Ongoing Cost) and/or lack of Capability (e.g., Technical Knowledge & Skills) could undermine Motivation, especially if dealing with multiple practical challenges.

The negative consequences of babywearing that mothers discussed the most were linked to their physical health, which affected their capability to carry. Several of the mothers had pre-existing physical health conditions or had an illness early in their experience and this prevented them from continuing with babywearing. Some of the mothers found it physically demanding to carry and experienced pain, discomfort, and tiredness. Heather's account below exemplifies the dynamic and often competing interactions within the COM-B behavioural module. Here, Heather describes how a medical condition contributed to a lack of Physical Strength/Skills (Capability) and how this constrained her ability to sustain babywearing behaviour, despite high initial Motivation.

> [My daughter] was a big baby. I mean she was in the 95th percentile I think about three or four months, she was a big baby. I'm not the biggest and with my back and hip problems [I found it difficult]. I had hip dysplasia as a baby…so I did carry her, but not that much, because basically my back got a break when she was in the pram. (Heather).

All of the participants owned a pram or buggy, Lisa suggested "you get a pram because everyone gets a pram (laughter)". This highlights potential barriers around the prevailing social norms around parenting. These norms were often reinforced by grandparents, who offered to buy traditional items like prams and buggies. Prevailing social norms around pram use created external pressures (Social Opportunity) that could shape or even conflict with mothers' intrinsic Motivation to babywear. Prams were seen as awkward, difficult to store, and impractical for many of the mothers. However, many participants did use them to get a break from babywearing and saw benefits of using them for certain things. For example, it can be used to transport equipment (including slings), carry groceries, and store bags, which isn't possible if you only use a sling. Even the mothers with a very strong babywearing identity were often keen to stress they used slings and buggies alongside each other for different purposes.

> I think it depends what we're going to be doing, whether we're going to take the pram. Because we find that if he's in the pram like he can have a meal, he can sit up. And he will go to sleep now. So that has got its benefits now as well now he's older. (Carrie)

Carrie's quote shows how mothers balanced Opportunity (choosing between Carriers vs Prams) with developing Capability and Motivation, adapting their behaviours flexibly depending on context.

Physical health was the biggest barrier to babywearing and in some cases prevented mothers from carrying their children. However, the practical benefits of babywearing, the convenience of everyday tasks and the ability to interact with older children in a safe and comfortable way, were significant motivational factors that encouraged babywearing behaviours. Overall, the balance between physical Capability, external Opportunities, and strong internal Motivation determined whether mothers could sustain babywearing, reinforcing the interconnected nature of these influences as shown in Fig. 1.

4. Discussion

This research investigated mothers' experiences of babywearing using the COM-B model of behaviour and TDF. The findings suggest

mothers experienced a range of barriers and enablers around initiating babywearing. Initial opportunity came from exposure to babywearing from family and friends, along with living in an area where babywearing was visible in the community. In this way, babywearing is perceived as a social norm, which then encourages mothers to use baby carriers. People within the mother's community like babywearing (injunctive social norm) and babywearing is something that many people do (descriptive social norm; Taylor et al., 2011). After starting to wear their child, the availability of social support via sling libraries and babywearing support groups helped to strengthen the mothers' capability to engage in the practice. Mothers felt that benefits of babywearing, especially during the initial stages of motherhood, included helping to soothe and settle crying or cranky babies and this in turn strengthened their beliefs about their capabilities because they felt more competent and confident as a mother.

As their experiences progressed and their child got older, social support continued to play a role in shaping babywearing behaviour. Informational, tangible, and emotional support was accessed from the mothers' close support networks. This had a positive effect on participants' identity as mothers, strongly influencing their motivation to engage in babywearing. Enablers of babywearing were related to the practicality of the activity, e.g., facilitating household tasks, going to shops or playgroups, and playing with older children while keeping a young child close. Barriers during this time included strong social norms around using buggies first and foremost that were reinforced by grandparents, who could often be sceptical of babywearing.

The findings of the present research complement and extend previous work (e.g., Williams & Turner, 2020a, 2020b), which suggests that babywearing can have many perceived benefits for both mothers and children, such as mother-child bonding, maternal responsiveness to child's needs, and practicality/convenience. The present research adds a closer analysis of these perceived benefits but also moves beyond identifying outcomes of babywearing to highlight factors that act as barriers and facilitators of babywearing behaviour in a wider sense. Our findings reflect developments in behavioural science that suggest behaviour should be understood within an array of interacting, complex factors (Michie et al., 2011). A key theoretical and methodological contribution of the present research, therefore, is in the use of the COM-B model as a framework for understanding the full range of factors that influence babywearing within a behavioural "system".

A common theme across all the interviews, and at all stages of the mothers' experience of babywearing, was the influence of factors with the *Opportunity* components of COM-B and TDF. These factors are often overlooked in previous research that has focused more on individual, psychological factors. In particular, social influence factors like social norms, social support, and group identity were significant influences on maternal babywearing behaviour. This finding is consistent with previous research that has explored other child rearing behaviours like breastfeeding (Russell et al., 2016) and baby-led weaning (Cameron et al., 2012). The availability of social support was useful in bolstering mothers' knowledge about practical skills and benefits of babywearing, i.e., improving the mothers' Capability. Help from support groups and sling libraries was particularly helpful in providing practical advice and emotional support, which was vital in enabling mothers to feel confident about the technical aspects of babywearing. Many mothers discussed social support from friends and family, and this was closely related to their perception of babywearing as a social norm in their network.

There were some accounts that suggest the social support processes around initiating and maintaining babywearing were not always straightforward. Although grandparents were key sources of support during the transition to parenthood, they often had views about babywearing that were at odds with the mothers' own ideas. This supports the view that social support is a multifaceted process that involves cognitive effort and interpersonal skill to negotiate (Lakey & Cohen, 2000). Because the mothers often found it difficult to manage the scale of changes they experienced during the initial months of parenthood, they sometimes struggled to manage their close relationships. Tensions with grandmothers around babywearing, and parental practices in general, sometimes reduced the mothers' motivation, acted as a barrier to babywearing, and negatively impacted some mothers' mental health. This echoes previous studies that have found a link between a lack of perceived support, anxiety, and depression (Racine et al., 2019), and further highlights the need to consider how close relationships influence babywearing behaviours.

Five participants took part in reflective discussions about the findings. Mothers, for the most part, endorsed our findings and felt they reflected their experiences of babywearing, or could see how the findings applied to others. All the participants felt that the identity aspect of babywearing was important, but two of the mothers were surprised by the finding that babywearing could be perceived as "cliquey". They felt that this did not reflect their experience and they were perturbed by the idea that some of the other participants found it difficult to connect with perceived babywearing in-groups. Rather than contradicting our results, we feel this supports and strengthens our findings related to identity, such that these mothers may have a particularly salient babywearing identity and experienced a type of identity threat (Steele et al., 2002) when the practices of the social group they feel part of were questioned. The social identity and perceived class dimension to babywearing is something that could warrant further research to understand how the practice can be framed in a more inclusive and welcoming way.

4.1. Practical implications

Our findings constitute a type of analytical generalisation (Smith, 2018) by offering a new and more nuanced conceptual insight into the nature of babywearing. Initial dissemination of our findings suggest they resonate with the personal experiences or tacit understanding of other mothers who wear their children, and so may also achieve a degree of naturalistic generalisation (Stake, 1995). Alongside evidence to suggest that babywearing can have positive benefits for mothers and children, this suggests the need to consider the practical applications of the findings to support babywearing behaviours.

Continuing the theme of social support, several participants discussed the potentially crucial role of health care professionals who interact with parents pre- and post-partum. The ultimate barrier to engaging with babywearing is a lack of awareness of its existence and knowledge around how to initiate the practice. Given the demonstrated benefits of babywearing in terms of physical health and psychosocial outcomes, paediatricians, midwives, and health visitors are ideally placed to signpost and educate new parents about the safe and appropriate use of carriers (Norholt et al., 2022). Similar psychoeducational support from midwives has been shown to increase initiation and duration of breastfeeding (Meedya et al., 2010).

More broadly, these research findings provide a clear framework to guide advocates who may wish to increase the prevalence of babywearing. For example, set up sling libraries or develop sling support networks that can foster psychological and physical capability; welcome new mothers into babywearing communities (social opportunity) and provide easy access to carriers (physical opportunity); make the benefits of carrier use clear to mothers (reflective motivation) and make it easy to "like" carriers (automatic motivation, e.g., by facilitating associations between carrier use and positive emotions).

4.2. Limitations and future research

The present research aimed to gain a comprehensive understanding of the barriers and facilitators of babywearing, but it is limited by the nature of our sample. Participants were drawn from a relatively narrow demographic group: straight, cisgender, heterosexual, (mostly) white, women. We would also describe the sample as largely middle-class, though this assumption is based on details from interviews rather than direct assessment. In addition, participants were mainly enthusiastic

about babywearing. While this enabled us to gain insight to both barriers and facilitators when initiating *and* maintaining babywearing, it is likely that some barriers that could plausibly be experienced by others were not experienced by this group. For example, participants were from relatively affluent backgrounds and did not discuss the financial costs involved in initiating babywearing in any detail. None of the participants mentioned worries about cultural appropriation – the use of slings, such as the meh dai, without proper acknowledgment of their historical and cultural context – but this has been raised as a potential barrier elsewhere (Hallenbeck, 2018).

Researcher positionality should also be considered as a potential limitation. In this case, despite examining the experiences of women (mothers) in relation to a typically highly gendered activity (babywearing), both researchers were men. Inevitably, the data collection and analysis processes will have been influenced by our male identity. It may be difficult or impossible for men to understand or represent the experiences of women in fundamental ways. In addition, our identity is likely to have impacted on the mothers' interview responses in ways that would not have occurred if the interviewer were a woman. The possible impact of researcher gender when researching other-gendered topics is discussed in detail by Lefkowich (2019). While our analysis is grounded in an active reflection on our status as insiders (babywearers) *and* outsiders (academics/fathers vs. community members/mothers), and while we have sought to centre the mothers' voice (including through asking them to respond to emerging findings), the study's findings should be evaluated in this light.

As our study is based on a relatively small sample of middle-class UK mothers we do not claim statistical generalisability. Instead, we align with qualitative traditions that prioritise theoretical, analytical, and naturalistic generalisability (Guenther & Falk, 2019; Smith, 2018). Our aim is not to make broad claims about all mothers, but to generate insights into the mechanisms and processes that shape babywearing practices within particular cultural and social contexts. In this sense, our findings offer analytical generalisability by illustrating how specific configurations of Capability, Opportunity, and Motivation interact to influence behaviour and these insights may be transferable to other parenting practices or settings where similar mechanisms are at play. Moreover, through rich description and contextual detail, we support naturalistic generalisability (Stake, 1995), allowing readers, particularly practitioners or researchers working in related areas, to judge the relevance of these findings to their own contexts.

Given the relatively homogeneous sample in our study, future research should explore babywearing within broader demographic groups, including those from less well-off backgrounds, men, same-sex parents, and people who discontinue babywearing. Exploring the experiences of these groups can add depth to our understanding and may help to inform programmes to promote babywearing as a therapeutic practice. These programmes could be evaluated, again using COM-B, to assess how interventions (e.g., education, training, incentivisation) and policies (e.g., marketing, guidelines, regulations) influence the instances (e.g., frequency, duration) and experiences of babywearing. A much larger mixed methods approach, with international samples, could also be used to further strengthen understanding. The model presented in Fig. 1 could be valuable in this context by helping to define variables of interest and measurement strategies.

Furthermore, while using the COM-B model enabled us to highlight the social norms that influenced the mothers' experience of babywearing, future studies might also consider a broader critical feminist perspective, societal narratives around what it means to be a good mother, and the ways in which these narratives intersect with class (Hallenbeck, 2018). The nature of the data collected for this study and the analytical structure imposed on it did not allow this level of critical analysis, but these issues should be borne in mind when considering the ways in which individuals and society as a whole engage with babywearing.

5. Conclusion

This paper has made several important contributions to our understanding of babywearing practices. First, we have used the TDF to comprehensively catalogue the major barriers and facilitators encountered by mothers in relation to babywearing. Second, we have highlighted key relationships between these and identified how different aspects of the COM-B model interact with one another. Third, we have provided a rich narrative context that demonstrates how these barriers and facilitators manifest in the experiences of mothers.

Our findings suggest babywearing should be understood as a practice influenced by individual differences (e.g., knowledge/skills), motivational (e.g., reflective process), and environmental (e.g., social support) factors within a complex behavioural "system". In particular, social influence factors, such as social norms, social support, and group identity were significant facilitators of babywearing behaviour. People within mothers' social networks often raised awareness of babywearing in the first instance, and their social support boosted mothers' capability to engage in babywearing and overcome barriers. However, mothers needed to negotiate complex social and relational processes, including dealing with negative views from people in their close network. Mothers overcame these barriers because of the salience of the perceived benefit of babywearing. All the mothers felt babywearing offered practical and emotional benefits for them and their child, including mother-child bonding, mother responsiveness to child's needs, and practicality/convenience.

CRediT authorship contribution statement

Diarmuid Verrier: Writing – original draft, Project administration, Methodology, Formal analysis, Conceptualization. **Christopher J. Brown:** Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.ecresq.2025.10.008.

Data availability

Data will be made available on request.

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