

Review Article

Sense of coherence as facilitated by water immersion during labour and birth: A concept analysis and synthesis

Megan Cooper^{*}, Annette Briley

College of Nursing and Health Sciences, Flinders University, Sturt Campus Bedford Park, South Australia, Australia



ARTICLE INFO

Keywords:

Concept analysis
Sense of coherence
Water immersion
Waterbirth
Hydrotherapy
Salutogenesis

ABSTRACT

Objective: To explore the concept of sense of coherence as facilitated by water immersion during labour and/or birth.

Design: A concept analysis and synthesis. A literature search of CINAHL, Medline, PubMed, PsycINFO and Emcare was undertaken in February 2022. Results were cross-checked with Google Scholar. No timeframe was specified, and results were restricted to research papers written in English. Overall, 2768 papers were retrieved and after removal of duplicates and unrelated papers, abstracts were screened to ensure the paper met the inclusion criteria i.e. women's experiences of water immersion for labour and/or birth. This process yielded a total of 37 articles and two theses, these were used for the concept analysis. Attributes were described and an exemplar case developed after mapping and charting of the data set.

Findings: Three attributes were identified; *agency, holistic and complete* and *more than pain relief* which align with the three sense of coherence components: *comprehensible, meaningfulness and manageability*.

Key conclusion: There is a growing evidence base regarding the use of intrapartum water immersion. The literature exploring women's experiences and views of water immersion, appears to consistently report that women experience physiological, physical and psychological benefits and that these benefits complement each other to facilitate greater self-efficacy and a more holistic experience. This combination of benefits afforded by water immersion facilitates a sense of coherence and subsequently, increases the likelihood of the woman experiencing labour and birth as both positive and satisfying.

Implications for practice: A greater understanding of women's experiences of water immersion will provide rationale and reason for making the option a real choice while revealing the positive impacts that it can have on all outcomes beyond just the physical.

Background

A growing evidence base highlights many reasons why water immersion is desired by women during labour and/or birth. There has been reference to water immersion facilitating a sense of coherence (SOC) for the woman, which in turn is hypothesised to lead to a more positive labour, birth and postnatal experience (Lewis et al. 2018). However, the concept of SOC as it relates to water immersion has not been fully explored.

Concepts are defined as 'an abstract or generic idea generalised from particular instances' (Merriam-Webster Dictionary, 2019). They are useful in shedding light upon phenomena and are therefore helpful in 'classifying experiences' (Meyer, 2013). As such, a concept analysis helps define what a concept is and is not. Concept analyses have

traditionally been used in nursing research for knowledge generation and while they have often been challenged as a flawed approach, Walker and Avant (2013) report that concept derivation is helpful, particularly where a concept is poorly understood.

Coherence holds significant meaning with respect to salutogenic theory. Salutogenesis was first described by Antonovsky (1979) as a means of better understanding the human experience of life and, more specifically, the factors that bring about health and wellbeing. These factors are not necessarily defined by an absence of disease or negative events but are more closely aligned with factors that bring about stability, and how these factors subsequently contribute to a positive experience for the individual. This is referred to as 'sense of coherence' (SOC) (Eriksson, 2017; Mittelmark et al., 2017). Health as it relates to the individual, is therefore argued to be influenced by a person's SOC.

^{*} Corresponding author.

E-mail address: Megan.Cooper@flinders.edu.au (M. Cooper).

SOC is influenced by, and therefore develops from, the social context of the individual which starts early in life (Mittelmark et al., 2017).

Antonovsky (1979) states sense of coherence is not a separate theoretical construct, but rather the foundation of salutogenic theory. This foundation includes more than good health, extending to culture, perceptions, meanings and experiences. As such, SOC is thought to be related to how the individual responds to the stressors and challenges of life, where mechanisms for coping are largely driven by the individual's attitudes towards life circumstances (Eriksson, 2017). Through the salutogenic lens, a person is orientated to see challenges and stressors as an opportunity to manage, comprehend and make meaning of life, which ultimately leads to health (Mittelmark et al., 2017). Ferguson et al. (2014) define SOC as:

'...an internal resource that enables people to resolve tension by identifying and mobilizing their resources... People with a strong SOC view life's activities as comprehensible, meaningful, and manageable, and they have the ability to manage tension effectively and resist health breakdown'

Identifying the concept and associated expressions

Coherence

Coherence is the state of being systematically or logically connected or consistent (Merriam-Webster Dictionary, 2022). From a linguistics perspective, coherence is used to describe the way in which single units of text (e.g., sentences) are logically combined to reflect sense and meaningfulness to the reader. In physics, coherence refers to the relationship between wave sources. Waves are said to be coherent if they are identical in frequency and form. In essence, coherence refers to various parts working together to bring about sense and meaning. Synonyms of coherence include balance, connected, consistent, unity and harmonious.

Coherence with respect to childbearing

The literature reflects that birth experience and satisfaction are complex phenomena with far reaching impacts on the woman, her baby and the wider family unit. It is well recognised that a woman's experience of pregnancy and childbirth is pivotal to her short-, medium- and long-term health and that of her infant. This was reflected by Sjöström et al. (2004) who found that women's wellbeing during pregnancy and birth were strongly associated with a SOC.

A positive childbearing experience is often discussed and defined as one that has considered the holistic needs of the individual woman. These needs include, but are not limited to, the psychological, physiological, physical, spiritual, cultural and social (Olza et al., 2018; World Health Organisation, 2018). Attention to these factors acknowledges that the woman is not just a collection of parts, but is a complete and complex person and more, that each of these factors are intermingled and dependent upon each other. Fundamentally, the interdependence between factors gives rise to holism and ultimately, a healthy pregnancy, birth and baby (Olza et al., 2018). Arguably, this is aligned with facilitating and maintaining a sense of coherence.

Sense of coherence with respect to the experience of labour and birth

Sense of coherence, with respect to labour and birth, refers to the woman's perceived ability to manage, comprehend and make meaning of the experience. Ferguson et al. (2014) examined the effect of SOC on birthing women in their scoping review of the literature and found four studies that suggested women with high SOC made choices that increased their likelihood of having a physiological birth. They concluded that regardless of where women gave birth, safety, self-determination and congruence were factors that contributed to a SOC. Women who were more satisfied with their birth experience

reported a higher level of SOC in the postnatal period, compared to that reported in the antenatal period. Subsequently, Ferguson et al. (2014) concluded that satisfaction with the birth experience is a pivotal component of health relating to childbearing and as such, the level of satisfaction is likely aligned to SOC and salutogenic theory.

Similarly, Ferguson et al. (2015) cross sectional survey found that there were fewer caesarean sections for women with high SOC and birth satisfaction improved with increasing SOC from antenatal through to the postnatal period. Whereas, women who experienced epidural anaesthesia or assisted vaginal birth reported low SOC. Women's preference for caesarean section has also been found to be associated with a lower SOC (Hildingsson, 2017).

In line with this, women's requests and preference for elective caesarean section have been linked to a severe fear of childbirth (FOC) (Stoll et al., 2018). A cross sectional study of 414 women in South-East Sweden found that women with a severe FOC were found to have lower SOC across all three components (comprehensibility, manageability and meaningfulness) (Voogand et al., 2020).

Sense of coherence and water immersion

Water immersion is commonly linked to a positive and fulfilling birth experience. In this paper, we define water immersion as a collective term for immersion of a woman in a bath/pool of warm water during any part of labour and/or birth. While it could be suggested that the benefits that water affords (such as its analgesic properties) contribute to a better birth experience, this alone is a superficial view of what we understand to be a more complex construct. The absence of labour pain, for example, is not always experienced negatively; in many cases, pain is actually welcomed and favoured.

SOC was drawn upon by Lewis et al. (2018) in their study using critical incident techniques to explore the perceptions of women who did and did not experience waterbirth in Western Australia. They found that women wanted a waterbirth because they were seeking a natural birth. They argued that this was dependent upon the woman viewing the option as a means of supporting a physiological life event aligned with health and wellbeing. Furthermore, they reported that even women who did not achieve a waterbirth, but who used water immersion, demonstrated a SOC reflected by the affirming words they used to describe their birth experience.

While Lewis et al. (2018) drew on SOC with respect to water immersion, there has been little examination or explanation of this phenomenon. Therefore, this paper attempts to examine the concept of sense of coherence with respect to water immersion for labour and birth.

The concept analysis and synthesis

It is well established that water immersion offers analgesic properties and facilitates a positive birth experience. However, there has been little exploration of the concept of 'sense of coherence' relating to water immersion for labour and birth. While Lewis et al. (2018) concluded that women experienced SOC from birthing in water, there was limited discussion of the key attributes of water immersion that contributed this SOC.

Aims

The aim of this paper is to conceptualise SOC as it applies to the woman's experience of using of water immersion during labour and/or birth.

Design

This concept analysis draws on the six-step process outlined by Rodgers (2000) (see Table 1). As Beecher et al. (2019) describe, Rodgers' framework is underpinned by the relativist perspective. The

Table 1
Rodgers (2000) Framework for concept analysis.

1. Identify the concept and associated expressions (such as surrogate terms).
2. Select an appropriate data collection realm.
3. Collect data.
4. Analyse data.
5. Identify an exemplar of the concept.
6. Identify implication's and propose hypotheses.

relativist perspective reflects the subjective experience as defined by the individual person and/or their cultural context. This is in comparison to the approaches described by [Hupcey and Penrod \(2005\)](#) and [Walker and Avant \(2018\)](#) which are underpinned by the reductionist, realist and positivist perspectives ([Beecher et al., 2019](#)). Our belief is that pregnancy and childbirth are highly subjective and unique experiences and therefore, applying a reductionist or positivist approach seems contradictory to our aims. As such, we believe Rodgers' framework best aligns with examining women's subjective experiences of using water for labour and/or birth and how this may contribute to a SOC.

To undertake a comprehensive review of the literature, the Joanna Briggs Institute's (JBI) scoping review methodology was employed. [Pollock et al. \(2021\)](#) suggest that a scoping review of the literature is appropriate for clarifying concepts.

Search methods (selecting an appropriate data collection realm)

A preliminary search was undertaken using the terms; *hydrotherapy, water immersion, waterbirth* and *wom?n, experience, views* combined with *labo?r, birth, childbirth, pool* and *bath*. Using the Population, Exposure, Outcomes (PEO) framework multiple search strings were tested in CINAHL. The final search terms were then searched in CINAHL, Medline, PubMed, PsycINFO and Emcare (see [Table 2](#) for full all search terms). Results were crosschecked with Google Scholar and reference lists of relevant papers were examined. No timeframe was specified. Search results were restricted to research papers and those written in English. Research using quantitative, qualitative and mixed methods approaches were considered.

Search outcome (collect data)

Searches were carried out in February 2022 by MC. A total of 2768 papers were retrieved and after removal of duplicates and unrelated papers, a total of 92 articles were analysed (see [Fig. 1](#)). Abstracts were screened by the authors to ensure the paper's met the inclusion criteria i. e., focused on examining women's experiences of using water immersion for labour and/or birth; this included self-assessment of their experience through psychometric or Likert scales or their own words. Papers that included observations of women using water were excluded, unless they also included the woman's self-assessment of any aspect of the experience of water immersion (e.g., control, pain perception). This process yielded a total of 37 articles and two theses. The final sample included studies from the United States of America (7), United Kingdom (4), Sweden (4), Australia (4), Canada (3), Poland (3), Ireland (2), Portugal (2), Switzerland (1), New Zealand (1), Iran (1) China (1), Spain (1), Brazil (1), Greece (1), Taiwan (1), Turkey (1) and Belgium (1) (see supplementary file 2).

Table 2
Search terms and strings using PEO.

Population	Wom?n* or mother or maternal or nulli* or primip* or multip*
Exposure	Water or water?birth or water immersion or hydrotherapy or birth* pool or bath* Intra?partum or intra-partum or birth* or childbirth or labo?r* or parturition or delivery
Outcomes	View* or experie*c* or perspectiv* or perception* or opinion* or belie* or attitude* or prefer* or feel* or satisfaction or self-efficacy

Appraisal

This concept analysis and review employed the JBI scoping approach to attain all papers related to women's experiences of using water immersion. All studies were assessed by both authors independently, to ensure they met the inclusion criteria. No disagreement arose between authors during this process. [Pollock et al. \(2021\)](#) suggest that critical appraisal is not required for scoping reviews and therefore, a quality appraisal of included papers was not undertaken.

Data abstraction and synthesis (analyse data)

To assist in defining the key attributes of the concept, a mapping of the data set was undertaken by both authors. The papers were read and reread line by line and from this, key results and findings were charted using a table to reflect commonality across papers (see [Table 3](#)). See supplementary data file 1 for a comprehensive mapping of the results/findings.

Results

Three attributes evolved from the data abstraction and synthesis of the literature: *agency, holistic and complete* and *more than pain relief* (see [Table 3](#)). These attributes are exemplified in the exemplar case presented in [Fig. 2](#).

Agency

Agency is central to how women perceive and experience water immersion during labour and birth. Women value the ability to exercise choice and autonomy around their birth experience and this appears to be no different when they choose water immersion ([Goodman et al., 2004](#); [Meyer, 2013](#); [O'Hare and Fallon, 2011](#); [Ulfsdottir et al., 2018a](#)). The literature reveals that women with the ability to be autonomous and make decisions about water are more likely to feel in control and empowered ([Hall and Holloway, 1998](#); [Lewis et al., 2018](#); [McKenna and Symon, 2014](#); [Úlfadóttir, 2019](#); [Ulfsdottir et al., 2018a](#)). They also express a sense of freedom. The combination of these factors often leads to women reporting higher levels of satisfaction with their birth experience ([Lathrop et al., 2018](#); [Maude and Foureur, 2007](#); [Ulfsdottir et al., 2018a](#); [Ulfsdottir et al., 2018b](#)). This concurs with the growing literature highlighting that birth satisfaction is intrinsically linked to the woman's ability to actively advocate for themselves and their babies and therefore the extent to which they can be self-determinant across their child-bearing experience ([Karlström et al., 2015](#); [O'Hare and Fallon, 2011](#)). These findings also align with [Cooper et al. \(2022\)](#) given that agency was identified as a factor in the WA+ER scale.

It appears the act of immersing in water, instils a sense of control in women. As such, they are better able to manage the pain of labour and thus achieve a physiological birth. Even women who do not achieve a waterbirth, but who experienced a sense of agency, still reflect on their experience as positive and affirming ([Antonakou et al., 2018](#); [Lewis et al., 2018](#)). This suggests there are other elements pivotal to the water immersion experience. For example, a supportive care provider is essential ([Gonçalves et al., 2018](#); [Hall and Holloway, 1998](#); [Lathrop et al., 2018](#); [Lewis et al., 2018](#); [Maude and Foureur, 2007](#)). Research highlights that midwives who support women in their choices and wishes, are a protective factor, in terms of overall satisfaction ([Lewis et al., 2018](#); [Maude and Foureur, 2007](#)). This means women are still likely to have a positive and satisfying experience, even though the birth may deviate from being physiological. This has been identified when women have the support of the midwife and therefore, the provision of information, mutual respect and understanding, reciprocity and the development of a partnership ([Lathrop et al., 2018](#); [Lewis et al., 2018](#); [Maude and Foureur, 2007](#)). [Lathrop et al.'s \(2018\)](#) study suggested that women who considered waterbirth were more likely to rate higher on

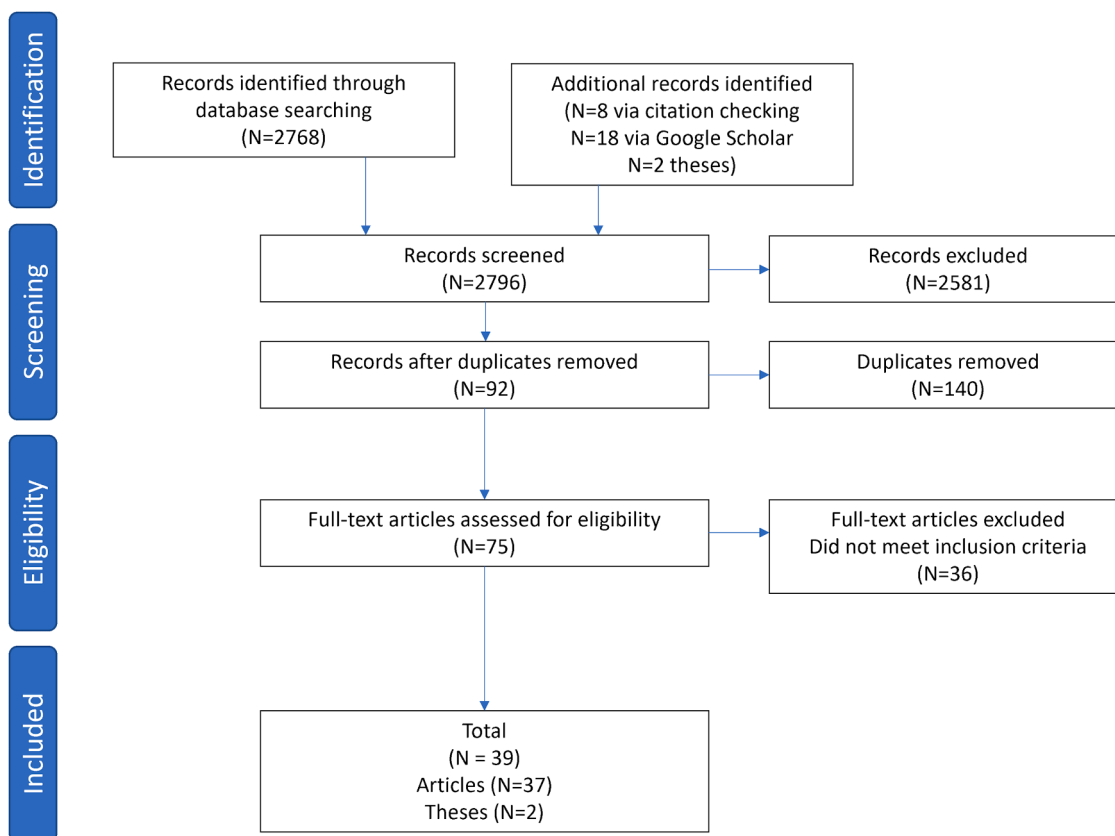


Fig. 1. PRISMA chart.

Table 3
Attributes of the concept.

Agency (self-determination)	Autonomy Control Decision making Empowerment Choice Satisfaction Freedom Liberation/transformation Midwifery support and partnership
Holistic and complete (congruence)	Physical benefits (including pain relief) Psychological benefits Postpartum benefits Temporal stabilising Heightened body awareness Mind/body connection Self-belief/trust Birth as a physiological process Intervention free/reduced intervention My body is built to birth Drug/medication free birth Natural and normal birth
More than pain relief (safety)	Coping/relief Soothing/Easing Relaxation Comfort Sanctuary Release Bliss/trance-like state Ease of movement/mobility Privacy and protection Shelter Safety/security Tranquillity/peaceful/calm Strong/powerful Buoyancy

the Childbirth Experience Questionnaire (CEQ) even when their birth was not in water. Conversely, women who feel out of control, unable to exercise autonomy or who do not have their choices facilitated, are generally less likely to view their experience of water immersion and therefore birth, positively.

Holistic and complete

Mind-body duality has been a source of debate over many decades and has become more prevalent in discussions around birth (Bateman et al., 2017; Carter, 2010; Walsh, 2010). This theory suggests that the mind and body are not interrelated or connected and in the case of birth, that the experience and any associated satisfaction are hinged solely on whether the body is physically able to give birth successfully (Carter, 2010). To demonstrate this, we draw on the commonly held view that a physically healthy mother and baby are all that are required to achieve a “good”, or positive, birth experience. Conversely there is increasing evidence suggesting that even when women achieve a ‘good’ birth by this definition, psychological distress and trauma are common (Priddis et al., 2018; Reed et al., 2017; Simpson and Catling, 2016; Skinner and Dietz, 2015). This infers that it is not just the way women give birth that defines their experience and satisfaction, but the circumstances that precede and follow birth are just as important (Priddis et al., 2018). As such, there is a need to acknowledge the woman as more than just a birth vessel (Smythe et al., 2016).

The literature reveals that women discuss the use of water as a holistic and complete approach to labour and birth associated with physical and psychological benefits (Gonçalves et al., 2018; Kavosi et al., 2015; Maude and Foureur, 2007; McKenna and Symon, 2014; Nutter et al., 2014; Sprague, 2004). They often experience a higher level of bodily awareness by becoming psychologically astute to how they are experiencing and receiving signals during birth (Gonçalves et al., 2018; McKenna and Symon, 2014; Sprague, 2004). One woman in Ulfsdottir

Xanthe is a first-time mother who is keen to keep things as normal as possible throughout her pregnancy and birth. She is aware that her local hospital has a continuity of carer model where she can opt to have a known midwife throughout pregnancy to six weeks postnatal. At her first appointment, she requests this type of care and at 12 weeks, is contacted by the midwife who will look after her throughout her childbearing experience. At 28 weeks, the midwife begins discussions around Xanthe's options for birth. She provides Xanthe with brochures and links to helpful websites and encourages her to start thinking about what she would prefer now, so they can talk about it over the coming appointments. Xanthe accesses the information and is drawn to the option of water immersion; she loves having a relaxing bath at home after work and one of her friends had a baby recently and spoke highly of the benefits water provides. She trusts that her body is built to birth and really wants an option that will facilitate her chances of having a normal birth. At the next appointment, Xanthe asks her midwife about waterbirth and the midwife talks in depth about the benefits and risks, as well as the hospital policy. She also informs Xanthe that she is accredited to facilitate water immersion and has previously supported many women in this option. Xanthe and her midwife continue to talk about water immersion over the course of her pregnancy. The midwife suggests that Xanthe will know when she is ready to get into the pool, but she will ensure that the bath is filled in readiness.

Xanthe calls her midwife at 40+1 weeks and informs her that she has been experiencing contractions. The midwife makes her way to the hospital and knowing Xanthe's decision, begins preparing and filling the bath. Xanthe arrives with Seth and the bath is already more than half full and immediately Xanthe feels relaxed by the sound of the running water. She experiences immediate comfort on entering the water and can adopt a position that feels comfortable. The water takes the edge of the pain, and she feels safe, in control and enveloped. Seth is by her side and the midwife is always there when Xanthe needs her. At times, Xanthe appears to be in a trance-like state and oblivious to the world around her. She expresses a feeling of being able to disappear to another place in between contractions. She knows when the contractions are building and focuses on her breathing. The midwife encourages her to go with her body and within 40 minutes of getting in the bath, she instinctually bears down and receives her baby boy (Harvey) not long after. While skin-to-skin with her baby, Xanthe births the placenta into the water 10 minutes later, without the need for synthetic oxytocin. Her blood loss is estimated at 250mL. Later that day, she is breastfeeding Harvey when the midwife comes in. She thanks the midwife and says 'I couldn't have wished for a better birth. It was exactly what I wanted. I feel like I could do anything.'

Fig. 2. Identifying an exemplar of the concept.

et al.'s (2018a) study stated that water was like “a lubricant for her brain” while Maude and Foureur (2007) explained that water immersion takes women to “somewhere else”.

Women experience greater sensory sensitivity with many discussing how it is not just the feeling of the water, but also the sight and sound of water, that causes benefit (Maude and Foureur, 2007; Sprague, 2004). Cammu et al. (1994) and Maude and Foureur (2007) expanded this further by referring to the temporal stabilising effect of water that offers more than just the absence of pain. They suggested that women enter a ‘trance’ or state of relaxation that instils greater levels of belief and trust in their bodies and babies, with this in turn increasing the likelihood of women achieving their desired birth (Gonçalves et al., 2018; McKenna and Symon, 2014; Sprague, 2004; Ulfsdottir et al., 2018a). A study by Ulfsdottir et al. (2018a)^(p 28) supports this finding with their analysis revealing the theme ‘synergy between body and mind.’ This synergy appears to extend beyond the birth as the woman welcomes her baby. Women suggest that their babies are calmer and more alert, which facilitates bonding and early breastfeeding (Cooper and Warland, 2019; Gonçalves et al., 2018; Lewis et al., 2018; Sprague, 2004).

Women’s belief in the birth process as a physiological life event often prompts them to seek water immersion (Gonçalves et al., 2018; Lewis et al., 2018; McKenna and Symon, 2014) in order to maximise their opportunities for a physiological birth and more, to avoid intervention, interference and pharmacological pain relief (Cluett et al., 2004; McKenna and Symon, 2014; Ulfsdottir et al., 2018a). This suggests there is a conscious choice by the woman to seek out water immersion with the intention of experiencing a physiological birth (Lewis et al., 2018).

More than pain relief

Water immersion is frequently discussed as a method of pain relief. It is often labelled as a non-pharmacological option, particularly when compared with other options such as epidural. While the literature reflects that women using water often rate pain lower on visual analogue scales (Benfield et al., 2001; Benfield et al., 2010; Mallen-Perez et al., 2018; Tuncay et al., 2019; Wu and Chung, 2003), there is growing evidence that challenges the notion or belief that water immersion is simply another pain relief option.

Women frequently suggest that the pain was not necessarily relieved or lessened by water immersion. Instead, they describe feeling more able to cope with the pain (Gonçalves et al., 2018; Maude and Foureur, 2007; Sprague, 2004; Ulfsdottir et al., 2018a). This likely explains, at least in part, why studies assessing women’s pain scores on visual analogue scales, have reported mixed results (Benfield et al., 2010; Nutter et al., 2014). In addition to this, women describe water immersion as a means of not just achieving a natural birth but also as a means of accessing and maintaining a soothing and relaxing environment (Cammu et al., 1994; Maude and Foureur, 2007; McKenna and Symon, 2014; Sprague, 2004). Words such as “all-encompassing” and “enveloping” have been used by women to describe their experiences.

After using water, women commonly discuss pain in a positive light. They describe the experience of water immersion as providing comfort, release and liberty (Maude and Foureur, 2007; McKenna and Symon, 2014; Ulfsdottir, 2019; Ulfsdottir et al., 2018a). They also experience a greater sense of safety, protection, privacy and shelter which is attributed to the bath creating a barrier between themselves and the rest of the world (Cooper and Warland, 2019; Gonçalves et al., 2018; Kavosi et al., 2015; Maude and Foureur, 2007; Sprague, 2004; Ulfsdottir et al., 2018a; Ulfsdottir et al., 2018b). Women also discuss how the buoyancy, warmth and weightlessness of water affords them the ability to move more easily and adopt positions that allow them to follow their body’s signals (Cluett et al., 2004; Gonçalves et al., 2018; Maude and Foureur, 2007; Sprague, 2004; Ulfsdottir et al., 2018a). Maude and Foureur (2007) refer to water as ‘sanctuary-like’ and suggest that women are not always able to articulate what water ‘does’ for them and so they talk about the way it makes them feel.

Discussion (identify implication’s and propose hypotheses)

This analysis has explored the concept of SOC as facilitated by water immersion. The findings suggest that water immersion not only contributes to, but also protects against threats to, a woman’s sense of coherence during labour and birth. Of significance is the alignment of the attributes generated from this concept analysis to both the key factors of SOC and also Ferguson et al. (2014) findings. See Table 4.

Comprehensibility, as the cognitive dimension, refers to the person’s ability to understand information in a coherent and clear manner. In this, there is the necessity for the person to be able to comprehend the situation in order to understand it. Where the person understands the situation, they are more able to manage it. Ferguson et al. (2014) refer to this as self-determination while we labelled this attribute, ‘agency.’ Both terms are reflective of a woman’s ability to gather and assimilate information to make decisions and adjust to the situation as necessary.

Meaningfulness is the dimension that aligns with motivation, it reflects that one has the ability to face challenges with positivity. Ferguson et al. (2014) refer to this as congruence. Our findings suggest that women who sought water immersion did so with the belief that their body was built for birth. They viewed labour and birth as physiological processes. As such, water immersion offered a drug and intervention free birth and the choice to use water reflected a self-belief and trust in their ability to tackle labour and birth.

Manageability is the behavioural dimension of SOC. It refers to the perceived degree of resources that are available to the person in order for them to manage the situation. We labelled this ‘more than pain relief’ to highlight how women discussed benefits beyond the analgesic properties of water immersion. Resources might therefore refer to the benefits that water affords, including buoyancy, shelter, privacy and ease of movement. Women also described the experience of water immersion as “sanctuary-like” and used terms like ‘bliss’ and ‘release.’ This suggests that they not only believed they could manage but also that the demarcation of the birth pool or bath offered safety aligning with Ferguson et al. (2014) findings.

Sense of coherence and water immersion

The labour and birth experience can be a pivotal and lifechanging time in a woman’s life. While it is also often advertised as a time when women experience significant amounts of pain and high levels of anxiety and vulnerability, our findings suggest that these challenges can be largely overcome when women choose to labour and/or birth in water.

The wider literature reflects significant benefits for the woman, and to some extent, the baby, when water immersion is used for labour and birth (Cooper and Warland, 2019; Feeley et al., 2021). While concerns about the safety of the practice persist, there is mounting evidence to suggest that water immersion is not only safe, but results in greater maternal satisfaction and more positive birth outcomes (Cluett et al., 2018; Gonçalves et al., 2018; McKenna and Symon, 2014; Nutter et al., 2014). This greater satisfaction and positivity contributes to greater confidence in the transition to motherhood, where the woman can bond with her baby (McKenna and Symon, 2014) and look forward to future pregnancies with less fear and anxiety (Benfield et al., 2001; Sprague, 2004). This extends to increased rates of physiological birth and

Table 4
Alignment with SOC Dimensions and Ferguson et al. (2014).

SOC Dimensions	Ferguson et al. (2014)	Concept Analysis
Comprehensibility/ Understandability	Self-determination	Agency
Meaningfulness	Congruence	Holistic and complete
Manageability	Safety	More than pain relief

perceived sense of control during labour and birth, as well as decreased pain perception, intervention (e.g. augmentation, episiotomy), use of pharmacological pain relief and the need for instrumental and surgical birth (Cluett et al., 2018; McKenna and Symon, 2014; Nutter et al., 2014). Furthermore, women are more likely to both use this option again in a subsequent birth, and to recommend water immersion to other women (Cammu et al., 1994; Cooper and Warland, 2019; Gonçalves et al., 2018; Lewis et al., 2018; Maude and Foureur, 2007). We propose the presence and combined effect of these factors facilitate a sense of coherence and in turn, lead to women expressing a more positive and fulfilling labour and birth experience when water is used.

Our findings further demonstrate that where women embrace labour and birth as physiological life events and seek to experience the physiological process by sourcing options such as water immersion, the outcomes are not only positive, but also satisfying and associated with both long- and short-term positive outcomes for the woman and child. The benefits extend beyond the physical, to the psychological, such that women can experience a reduction in anxiety and an increase in parenting confidence as examples (Tuncay et al., 2019). It appears that women who use water immersion do become truly immersed in their birth experience, they are able 'go within' or access a 'blissful' or 'trance-like' state which facilitates what Ulfsdottir et al. refer to as a 'synergy between mind and body.' We propose this reflects a sense of coherence as described by Antonovsky (1979) and Eriksson (2017).

The synergy between body and mind owing to water immersion reported by Ulfsdottir et al. (2018a) is synonymous with the attribute 'holistic and complete' defined in this analysis. This can be measured not only by the physical and psychological benefits that women experience as a result of water immersion, but also how such an experience influences their self-efficacy, belief and trust in birthing their baby. This further facilitates a sense of agency. With agency comes a greater sense of control where both are facilitated by understanding and comprehension of all information relevant to decision making. As the ability to be autonomous is dependent on the freedom to make decisions and therefore, the ability to exercise control and choice without fear of repercussions, agency is pivotal in defining the experience of birth. It therefore influences the level of empowerment the woman feels and how satisfied she is with her experience of birth (Maimburg et al., 2016). Therefore, it could be suggested that water immersion facilitates, not just a sense of agency and self-determination, but also a sense of coherence (Ferguson et al., 2014).

This concept analysis and synthesis supports the growing evidence that a positive and satisfying birth experience is much more than just a physically healthy mother and baby. It also aligns with the development of WA+ER scale developed by Cooper et al. (2022). By drawing on the attributes discovered within this concept analysis, we propose that the option of water immersion offers women the means to reclaim both the process and experience of birth through the facilitation of agency (comprehensibility), a holistic and complete experience (meaningfulness) and by offering more than just pain relief (manageability), all of which align with achieving a sense of coherence.

Implications for practice and/or policy

Lewis et al. (2018) identified that respectful maternity care, through the development of a partnership between a woman and midwife, is a significant factor for ensuring a woman's overall health and wellbeing. We found that SOC was even more evident where women were supported by a midwife and the midwife supported their choice to use water during labour and/or birth. Thus, confirming two of the most significant factors to the use of water during labour and/or birth are (1) the availability of supportive and qualified staff able facilitate birth as physiologically natural and (2) a woman who has made the decision to use water (Cooper et al., 2019; Maude and Foureur, 2007). This is not dissimilar from the findings of a meta-synthesis examining women's psychological experiences of physiological childbirth which found that

women's trust with maternity care providers not only facilitates a sense of control but also strengthened women's sense of coherence (Olza et al., 2018). A lack of information and support from suitably qualified staff, have been identified as a barriers to water immersion that can impact on the woman's experience or eliminate the option entirely (Antonakou et al., 2018; Cooper et al., 2017; Cooper et al., 2019; Dado et al., 2022). These factors are likely to influence the SOC women experience with respect to water immersion. These findings concur with existing evidence stating outcomes are improved where women can access midwifery care and where midwives can facilitate options of care that are important to women they work with.

Our findings emphasise the urgent need for improved access to midwifery models of care and water immersion for labour and birth.

Strengths and limitations

Pregnancy and birth are unique experiences that are difficult to align and/or compare with other experiences. It is important to point out that women may have had high SOC prior to giving birth which contributed to their choice to use water immersion. However, the findings of this concept analysis and synthesis, highlight that SOC was maintained if not increased by the use of water immersion. While a thorough literature search was undertaken, it is possible that not all relevant articles were sourced, especially if they were written in languages other than English. While the intention was to include these papers, translation via Google Translate yielded poor quality outputs and without funding to support professional translation, the decision was made to exclude non-English language papers. It is also acknowledged that this concept analysis only explores SOC by examining the woman's experience of water immersion from existing literature. Primary research examining the relationship between SOC, and water immersion would be advantageous. Generalisability of these findings to other contexts where water immersion may be used for therapeutic purposes is limited. Despite the limitations, this is the first paper to explore the concept of sense of coherence as it relates to labour and birth in water. The findings help to articulate the benefits afforded by water immersion and to provide further context and meaning to the experience of labouring and birthing in water which has not been easy to define or articulate by women, midwives and researchers.

Conclusion

This concept analysis and synthesis was prompted by the recognition of limited investigation of the concept of sense of coherence as it relates to water immersion for labour and birth. The findings highlight that water immersion for labour and birth provides women with much more than pain relief. Women say it also facilitates a sense of agency, is holistic and complete and aligns with birth as a natural and physiological life event. Women see it as a mechanism for keeping birth as physiological as possible and as an opportunity to be acknowledged as a complete person, rather than just the vessel for birth. By better understanding the experience from the woman's perspective, it is anticipated that water immersion will not only be recognised for the benefits it provides but more, for its ability to facilitate a sense of coherence and therefore, in contributing to a more positive and fulfilling childbearing experience.

Author contributions

The authors of this paper meet the following four criteria:

- 1 Have made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data;
- 2 Been involved in drafting the manuscript or revising it critically for important intellectual content;

- 3 Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; and
- 4 Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Funding

This project received no funding.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgment

Thank you to a reviewer of a previous manuscript of the first author who prompted the alignment of sense of coherence with water immersion for labour and birth.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.midw.2023.103824](https://doi.org/10.1016/j.midw.2023.103824).

References

- Antonakou, A., Kostoglou, E., Papoutsis, D., 2018. Experiences of Greek women of water immersion during normal labour and birth. A qualitative study. *Eur. J. Midwifery* 2.
- Antonovsky, A., 1979. Health, stress, and coping: new perspectives on mental health and physical well-being. San Francisco.
- Bateman, L., Jones, C., Jomeen, J., 2017. A narrative synthesis of women's out-of-body experiences during childbirth. *J. Midwifery Womens Health* 62 (4), 442–451.
- Beecher, C., Devane, D., White, M., Greene, R., Dowling, M., 2019. Concept development in nursing and midwifery: an overview of methodological approaches. *Int. J. Nurs. Pract.* 25 (1), e12702.
- Benfield, R.D., Herman, J., Katz, V.L., Wilson, S.P., Davis, J.M., 2001. Hydrotherapy in labor. *Res. Nurs. Health* 24 (1), 57–67.
- Benfield, R.D., Hortobágyi, T., Tanner, C.J., Swanson, M., Heitkemper, M.M., Newton, E. R., 2010. The effects of hydrotherapy on anxiety, pain, neuroendocrine responses, and contraction dynamics during labor. *Biol. Res. Nurs.* 12 (1), 28–36.
- Cammu, H., Clasen, K., Wettete, L.V., Derde, M.P., 1994. To bathe or not to bathe during the first stage of labor. *Acta Obstet. Gynecol. Scand.* 73 (6), 468–472.
- Carter, S.K., 2010. Beyond control: body and self in women's childbearing narratives. *Sociol. Health Illn.* 32 (7), 993–1009.
- Cluett, E.R., Burns, E., Cuthbert, A., 2018. Immersion in water during labour and birth. *Cochrane Database Syst. Rev.* (5).
- Cluett, E.R., Pickering, R.M., Getliffe, K., Saunders, N.J.S.G., 2004. Randomised controlled trial of labouring in water compared with standard of augmentation for management of dystocia in first stage of labour. *BMJ* 328 (7435), 314.
- Cooper, M., McCutcheon, H., Warland, J., 2017. A critical analysis of Australian policies and guidelines for water immersion during labour and birth. *Women Birth* 30 (5), 431–441. <https://doi.org/10.1016/j.wombi.2017.04.001>.
- Cooper, M., Pollock, D., Warland, J., McLinton, S., 2022. The development of the WA+ER (water immersion agency plus expectations and relief) scale. *Midwifery*, 103298.
- Cooper, M., Warland, J., 2019. What are the benefits? Are they concerned? Women's experiences of water immersion for labor and birth. *Midwifery* 79, 102541.
- Cooper, M., Warland, J., McCutcheon, H., 2019. Practitioner accreditation for the practice of water immersion during labour and birth: Results from a mixed methods study. *Women Birth* 32 (3), 255–262.
- Dado, M., Smith, V., Barry, P., 2022. Women's experiences of water immersion during labour and childbirth in a hospital setting in Ireland: A qualitative study. *Midwifery*, 103278.
- Eriksson, M., 2017. The Sense of Coherence in the Salutogenic Model of Health, *The Handbook of Salutogenesis*. Springer, Cham, pp. 91–96.
- Feeley, C., Cooper, M., Burns, E., 2021. A systematic meta-thematic synthesis to examine the views and experiences of women following water immersion during labour and waterbirth. *J. Adv. Nurs* 77 (7), 2942–2956.
- Ferguson, S., Davis, D., Browne, J., Taylor, J., 2014. Sense of coherence and childbearing: a scoping review of the literature. *Int. J. Childbirth* 4 (3), 134–150.
- Ferguson, S., Davis, D., Browne, J., Taylor, J., 2015. Sense of coherence and childbearing choices: a cross sectional survey. *Midwifery* 31 (11), 1081–1086.
- Gonçalves, M., Coutinho, E., Pareira, V., Nelas, P., Chaves, C., Duarte, J., 2018. Woman's satisfaction with her water birth experience. *World Conference on Qualitative Research*. Springer, pp. 255–265.
- Goodman, P., Mackey, M.C., Tavakoli, A.S., 2004. Factors related to childbirth satisfaction. *J. Adv. Nurs.* 46 (2), 212–219.
- Hall, S.M., Holloway, I.M., 1998. Staying in control: women's experiences of labour in water. *Midwifery* 14 (1), 30–36.
- Hildingsson, I., 2017. Sense of coherence in pregnant and new mothers—A longitudinal study of a national cohort of Swedish speaking women. *Sex. Reprod. Healthc.* 11, 91–96.
- Hupcey, J.E., Penrod, J., 2005. Concept analysis: examining the state of the science. *Res. Theory Nurs. Pract.* 19 (2), 197–208.
- Karlström, A., Nystedt, A., Hildingsson, I., 2015. The meaning of a very positive birth experience: focus groups discussions with women. *BMC Pregnancy Childbirth* 15 (1), 251.
- Kavosi, Z., Keshkaran, A., Setoodehzadeh, F., Kasraeian, M., Khammarnia, M., Eslahi, M., 2015. A comparison of mothers' quality of life after normal vaginal, cesarean, and water birth deliveries. *Int. J. Community Based Nurs. Midwifery* 3 (3), 198.
- Lathrop, A., Bonsack, C.F., Haas, D.M., 2018. Women's experiences with water birth: a matched groups prospective study. *Birth* 45 (4), 416–423.
- Lewis, L., Hauck, Y.L., Crichton, C., Barnes, C., Poletti, C., Overing, H., Keyes, L., Thomson, B., 2018. The perceptions and experiences of women who achieved and did not achieve a waterbirth. *BMC Pregnancy Childbirth* 18 (23).
- Maimburg, R.D., Væth, M., Dahlen, H., 2016. Women's experience of childbirth—A five year follow-up of the randomised controlled trial “Ready for Child Trial. *Women Birth* 29 (5), 450–454.
- Mallen-Perez, L., Roé-Justiniano, M.T., Ochoa, N.C., Colomat, A.F., Palacio, M., Terré-Rull, C., 2018. Use of hydrotherapy during labour: Assessment of pain, use of analgesia and neonatal safety. *Enferm. Clin.* 28 (5), 309–315.
- Maude, R.M., Foureur, M.J., 2007. It's beyond water: stories of women's experience of using water for labour and birth. *Women Birth* 20 (1), 17–24.
- McKenna, J.A., Symon, A.G., 2014. Water VBAC: Exploring a new frontier for women's autonomy. *Midwifery* 30 (1), e20–e25.
- Merriam-Webster Dictionary, 2019. Concept. <https://www.merriam-webster.com/dictionary/concept>. (Accessed 26 July 2019).
- Merriam-Webster Dictionary, 2022. Coherence. <https://www.merriam-webster.com/dictionary/coherence>. (Accessed 18 March 2022).
- Meyer, S., 2013. Control in childbirth: a concept analysis and synthesis. *J. Adv. Nurs.* 69 (1), 218–228.
- Mittelmark, M.B., Bull, T., Daniel, M., Urke, H., 2017. Specific Resistance Resources in the Salutogenic Model of Health, *The Handbook of Salutogenesis*. Springer, Cham, pp. 71–76.
- Nutter, E., Meyer, S., Shaw-Battista, J., Marowitz, A., 2014. Waterbirth: an integrative analysis of peer-reviewed literature. *J. Midwifery Womens Health* 59 (3), 286–319.
- O'Hare, J., Fallon, A., 2011. Women's experience of control in labour and childbirth. *Br. J. Midwifery* 19 (3), 164–169.
- Olza, I., Leahy-Warren, P., Benyamin, Y., Kazmierczak, M., Karlsdóttir, S.I., Spyridou, A., Crespo-Mirasol, E., Takács, L., Hall, P.J., Murphy, M., 2018. Women's psychological experiences of physiological childbirth: a meta-synthesis. *BMJ Open* 8 (10), e020347.
- Pollock, D., Davies, E.L., Peters, M.D., Tricco, A.C., Alexander, L., McInerney, P., Godfrey, C.M., Khalil, H., Munn, Z., 2021. Undertaking a scoping review: a practical guide for nursing and midwifery students, clinicians, researchers, and academics. *J. Adv. Nurs.* 77 (4), 2102–2113.
- Priddis, H.S., Keedle, H., Dahlen, H., 2018. The Perfect storm of trauma: the experiences of women who have experienced birth trauma and subsequently accessed residential parenting services in Australia. *Women Birth* 31 (1), 17–24.
- Reed, R., Sharman, R., Inglis, C.J., 2017. Women's descriptions of childbirth trauma relating to care provider actions and interactions. *BMC Pregnancy Childbirth* 17 (1), 21.
- Rodgers, B.L., 2000. Concept analysis: an evolutionary view. In: Rodgers, B.L., Knaf, K. A. (Eds.), *Concept development in nursing: Foundations, techniques and applications*. Saunders, Philadelphia.
- Simpson, M., Catling, C., 2016. Understanding psychological traumatic birth experiences: a literature review. *Women Birth* 29 (3), 203–207.
- Sjöström, H., Langius-Eklöf, A., Hjertberg, R., 2004. Well-being and sense of coherence during pregnancy. *Acta Obstet. Gynecol. Scand.* 83 (12), 1112–1118.
- Skinner, E.M., Dietz, H.P., 2015. Psychological and somatic sequelae of traumatic vaginal delivery: a literature review. *Aust. N. Z. J. Obstet. Gynaecol.* 55 (4), 309–314.
- Smythe, E., Hunter, M., Gunn, J., Crowther, S., Couper, J.M., Wilson, S., Payne, D., 2016. Midwifing the notion of a 'good' birth: a philosophical analysis. *Midwifery* 37, 25–31.
- Sprague, A.G., 2004. An Investigation Into the Use of Water Immersion Upon the Outcomes and Experience of Giving Birth. St Patrick's Campus. Australian Catholic University, Melbourne.
- Stoll, K., Fairbrother, N., Thordarson, D.S., 2018. Childbirth fear: relation to birth and care provider preferences. *J. Midwifery Women's Health* 63 (1), 58–67.
- Tuncay, S., Kaplan, S., Moraloglu Tekin, O., 2019. An assessment of the effects of hydrotherapy during the active phase of labor on the labor process and parenting behavior. *Clin. Nurs. Res.* 28 (3), 298–320.
- Úlfssdóttir, H., 2019. To Give Birth in Water. Karolinska Institutet, Stockholm.
- Úlfssdóttir, H., Saltvedt, S., Ekborn, M., Georgsson, S., 2018a. Like an empowering micro-home: a qualitative study of women's experience of giving birth in water. *Midwifery* 67, 26–31.

- Ulfssdottir, H., Saltvedt, S., Georgsson, S., 2018b. Waterbirth in Sweden—a comparative study. *Acta Obstet. Gynecol. Scand.* 97 (3), 341–348.
- Voogand, M., Alehagen, S., Salomonsson, B., 2020. The relationship between fear of childbirth and sense of coherence in women expecting their first child. *Sex. Reprod. Healthc.* 26, 100555.
- Walker, L.O., Avant, K.C., 2018. *Strategies for Theory Construction in Nursing*. Pearson, New York, 6 ed.
- Walker, L.O., Avant, K.C., Avant, K.C., 2013. *Strategies for Theory Construction in Nursing: Pearson New International Edition*. Harlow: Pearson Education UK, Harlow.
- Walsh, D.J., 2010. Childbirth embodiment: problematic aspects of current understandings. *Sociol. Health Illn.* 32 (3), 486–501.
- World Health Organisation, 2018. *WHO recommendations: intrapartum care for a positive childbirth experience*. WHO.
- Wu, C.J., Chung, U.L., 2003. The decision-making experience of mothers selecting waterbirth. *J. Nurs. Res.* 11 (4), 261–268.