Effectiveness Of Hydrotherapy In Reducing Labour Pain: A Systematized Literature Review

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Abstract
Background: *Waterbirth has gained popularity as an alternative birthing option globally, yet its implementation and acceptance in clinical practice remain limited in Singapore.*
Study Aim: *This systemized literature review aims to investigate the effectiveness of waterbirth in reducing labour pain compared to traditional births among pregnant women in Singapore.*
Methodology: *This systematized literature review used databases such as CINAHL (Cumulative Index to Nursing and Allied Health Literature), Ovid MEDLINE, PubMed, EMBASE (Excerpta Medica Database), and Web of Science. Selected articles were appraised using the Joanna Briggs Institute Checklist.*
Conclusion: *A systematized review of the literature shows that warm showers for labour and immersion in water for labour comprise a multidimensional analysis of their potential impact on the birthing process. Both methods have demonstrated subjective advantages, including pain reduction and a reduction in labour time.*
Keywords: *waterbirth, labour pain, alternative birthing options, randomised controlled trial, Singapore, maternal healthcare, pain management, childbirth experience*

I.   Background

Definition of Labour Pain

Warm water births are becoming more and more popular among expectant mothers who want a more comfortable and natural childbirth experience. Although its exact history is unknown, Bashaikh et al. (2022) believes that there is evidence that water immersion has been utilised as a "therapeutic" treatment for physical and psychological ailment from the time of the Greeks and Romans. Waterbirth is linked to favourable effects for the mother, including relaxation, pain alleviation, and buoyant effects, which promote mobility and a sensation of control, leading to a happy birth experience (Nutter et al., 2014). Contrary to popular belief, many women views giving birth in water as a good and "more natural" experience. Labour pain is a notable concern for pregnant women, and finding effective pain management strategies is crucial. Research on water birth is particularly interesting because it is thought to provide comfort and pain alleviation during labour. However, there is debate about the method's safety for both mothers and babies (Ulfsdottir et al., 2018).

Pain Management for Labour Pain

Childbirth is a transforming and often stressful event for pregnant women, characterised by varied degrees of pain and agony. Numerous treatments and interventions have been identified and implemented over the years to alleviate the pain associated with labour, with the goal of guaranteeing the mother's and new-born's safety and well-being. Water birth has become one of these methods that holds up the possibility of pain reduction, comfort, and a distinctive delivering experience.

Hydrotherapy

As a non-pharmacological method of childbirth, hydrotherapy is used in both the first and second stages of labour. The practice of hydrotherapy involves a variety of methods, including hot showers, immersion in water, hot, cold, or warm baths in bathtubs, or immersion in warm water in a jacuzzi (Cowan et al., 2017a; Taghavi et al., 2015). It is significant to distinguish between hydrotherapy types during labour. In this review, hydrotherapy refers to an intervention performed in a bathtub or shower during the first stage of labour. The purpose of this literature review is to explore the efficacy of warm water immersion during any stage of labour, up to but excluding the birth of a new-born.

Benefits of Hydrotherapy

During labour, hydrotherapy offers several potential benefits for both the birthing female and her experience. In the context of childbirth, warm water immersion offers an alternative to conventional pain relief strategies and birthing methods. A significant benefit of hydrotherapy is that it is strongly associated with improved mobility, allowing for easier position changes during labour. This may contribute to an increased level of comfort. Moreover, hydrotherapy improves circulation, which is beneficial to both the mother and the child during birth (Stringer & Hanes, 1999). Evidence suggests a reduced risk of perineal trauma, shorter durations of the first stage of labour, and a reduction in the need for analgesia or anaesthesia, as well as a reduction in episiotomies (Cowan et al., 2017b; Mallen-Perez et al., 2018).

II.   Clinical Question

The clinical question is: Effectiveness of water birth in lowering labour pain? is the review question.

PICO

For the review, the population of interest includes pregnant women at term, defined as women who have reached 37 weeks of gestation or later Razaz et al., 2022). This study investigates hydrotherapy, which involves labour and childbirth taking place in a tub or pool of warm water, in order to manage pain during labour and childbirth. It contrasts with the comparison group, which consists of pregnant women who underwent traditional land-based methods in a hospital or birthing centre without water immersion. The primary outcome of interest is the reduction in the amount of pain pregnant women experience during labour. Measurement and comparison of pain intensity between the two groups are performed using pain assessment tools or scales, such as Visual Analogue Scales (VAS) and Numerical Rating Scales. The PICO framework guiding the literature review is illustrated in Table 1.

Table 1. *PICO Framework to Identify Keywords and Synonyms*

Elements from PICO framework	Keywords	Search terms	Databases
Population	Pregnant women with labour pain	Labour pain OR Obstetric pain OR pelvic pain	PubMed CINAHL EMBASE Ovid Ovid MEDLINE WebofScience
Intervention	Water birth	Hydrotherapy OR Water immersion OR Aquatic birth OR bathing and baths	
Outcome	Reduced pain scores	Maternal satisfaction OR Pain relief OR Pain management	

Search Process
Search Strategy

Electronic databases such as CINAHL (Cumulative Index to Nursing and Allied Health Literature) (37), Ovid MEDLINE (177), PubMed (32), EMBASE (Excerpta Medica Database) (8), and WebOfScience(111) were used to conduct the search. CINAHL Complete is a subject-specific database that is extensively used in nursing and multidisciplinary health care. According to Dhippayom et al. (2023), the CINAHL database is an EBSCO-hosted bibliographic database that gathers research findings from over 3,800 nursing and allied health journals, with access to comprehensive data spanning back to 1961.A well-known search engine, PubMed offers millions of peer reviewed scholarly biomedical publications for free or open access (Edhlund & McDougall, 2014). Elsevier (n.d.) describes EMBASE as a comprehensive database that covers biomedical literature and uses the PICO approach to assist searches. Approximately 200 journals are directly accessible through Ovid MEDLINE via Journals@Ovid which provides seamless access to full-text articles facilitating convenient access to selection of articles (De Groote & Dorsch, 2003). According to Li et al. (2017), Web of Science is the world's most popular platform for searching and analysing scientific citations, and it is backed by a wide range of different knowledge.

Researchers can obtain extensive coverage of high-quality, peer-reviewed literature papers relating to nursing disciplines using these databases. This ensures that the data obtained is relevant to the nursing areas and will assist to evidence-based judgements as researchers stay up to date on the current breakthroughs in information available.

The trends or changes on waterbirth are very slow i.e. hence the data used need 10 years to depict the changes as waterbirth (Pontis et al., 2015). By considering research data from the past 10 years, it helps to identify existing research gaps. As waterbirth only gained popularity during the last decades (Poder et al., 2022) and is not widely facilitated in hospitals compared to conventional methods of childbirth. Therefore, only peer-reviewed journals in the English language within the last 10 years, from 2013 to 2023, were considered.

To ascertain if the articles satisfy the clinical question, limiters, inclusion criteria, and exclusion criteria were implemented. This review included women of any age in labour as the focus of the research is on pain felt by women during childbirth in the water. Table 2 illustrates the selection criteria for articles.
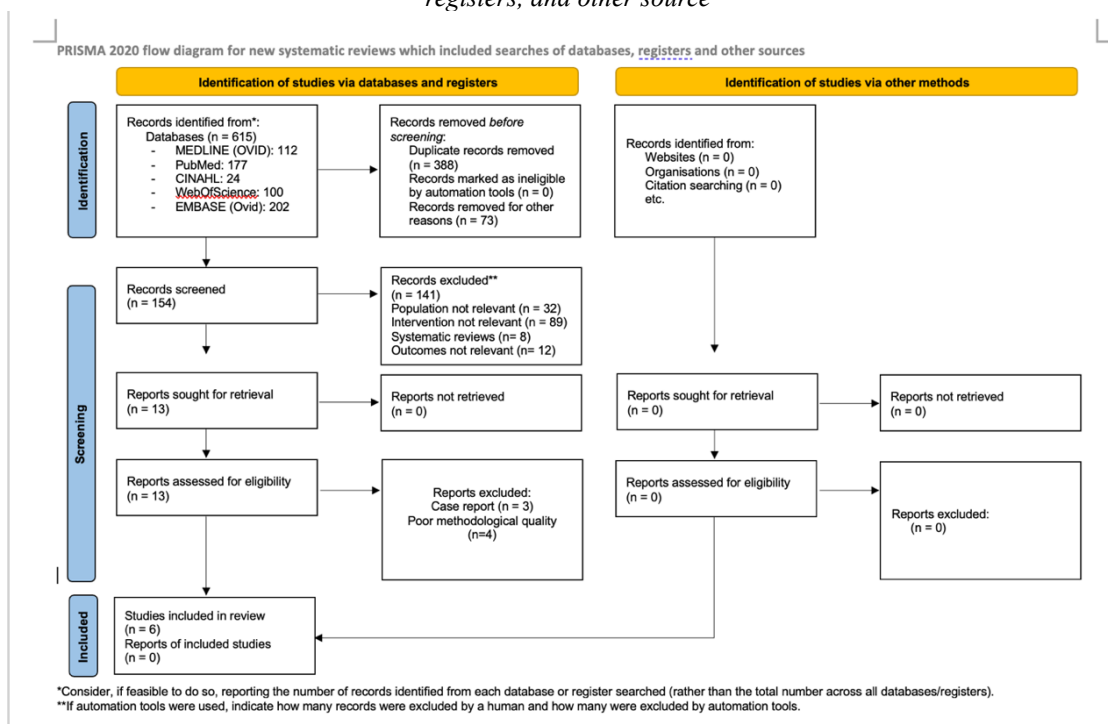
Table 2. *Inclusion and Exclusion Criteria*

Selection Criteria	Inclusion	Exclusion
Population	Pregnant women in labour	Expectant women with underlying conditions
Intervention	Various forms of water immersion, such as full immersion in a birthing pool, partial immersion in a bathtub, or the use of warm water for pain relief during labour.	
Publication Date	Studies published from 2013-2023	
Study Design	Randomised Controlled Trials,	Case studies, Systematic reviews
Study Type	Peer reviewed articles/journals	Studies lacking relevant outcome data
	Studies reporting on pain intensity scores, maternal satisfaction, neonatal outcomes	
Types of articles	Full length research articles	Conference abstracts, dissertations
Language	English or specified language proficiency for translation	

Search Results

A flow diagram that illustrates the steps involved in finding, vetting, and choosing articles for a systematic review or meta-analysis is called the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) 2020 (Kahale et al., 2022). In the realm of evidence-based practice, it is an indispensable tool for ensuring repeatability and transparency in the reporting of systematic reviews (Page et al., 2021). A literature search was performed using electronic databases such as CINAHL (Cumulative Index to Nursing and Allied Health Literature) (37), Ovid MEDLINE (177), PubMed (32), EMBASE (Excerpta Medica Database) (8), and WebOfScience(111). Using pertinent keywords like "childbirth", "hydrotherapy", "natural childbirth", "nonpharmacologic", "labour" and "waterbirth" as seen in Table 1. Out of the 615 articles that were found in the first search, 177 were found via PubMed, 112 through MEDLINE (Ovid), 100 through Web of Science, 24 through CINAHL, and 202 through EMBASE Titles and abstracts were used to filter 154 distinct articles after duplicates were eliminated. 21 publications were chosen for a full-text review after the filtering procedure. This literature analysis ultimately contained 6 research publications that examined the impact of water birth on pregnancy health outcomes. Figure 1 below illustrates the PRISMA flow diagram.

Figure 1. *PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers, and other source*

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources

*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

Quality Appraisal of Eligible Articles
Study Characteristics

A comprehensive examination of each included study was carried out in this analysis to ensure methodological rigour and validity which can be found in Appendix B. The attributes of the articles were then located, gathered, and displayed in a table that may be found in Appendix D. The studies cover a range of geographical regions providing a global view on the practise of giving birth in water. There were two articles originating from Turkey (Taskin & Ergin, 2021; Tuncay et al., 2019), one article from South Africa (Nikodem, et al., 2022), one from Iran (Kolivand et al., 2014), one from Taiwan (Lee et al., 2013) and one from China (Liu et al., 2014). The study spans somewhere between seven months and three years. The sample size ranges from 80 to 130 participants, with a total cohort size of 619 women in labour. The participants also vary in terms of age, gestational age, and parity. A combination of randomised controlled trials (RCTs) and observational studies was used allowing for a thorough evaluation of the impact of water birth on labour pain management. Pain intensity scores, labour duration, mother satisfaction, and newborn outcomes were among the outcome indicators routinely studied across studies. These traits provide an in-depth comprehension of the efficacy of water delivery in various circumstances and among a variety of expectant groups.

The most common assessment tools were visual analogue scale (Lee et al., 2013; Liu et al., 2014; Taskin & Ergin, 2021; Tuncay et al., 2019). It makes up of a line with a point from 1 to 10 representing the patient's pain intensity between the extremes of "no pain" and "unbearable pain." This makes VAS an ideal tool for describing pain degree or intensity due to its ratio scale features which adds to its simplicity and validity (Bird & Dickson, 2001; Bodian et al., 2001). For the control group, it was mostly standard routine hospital care (Kolivand et al., 2014; Lee et al., 2013; Liu et al., 2014; Nikodem et al., 2022; Taskin & Ergin, 2021; Tuncay et al., 2019).

Most of the studies water temperature was held consistent at 36-38°C (Kolivand et al., 2014; Lee et al., 2013; Taskin & Ergin, 2021; Tuncay et al., 2019). Only two studies (Liu et a., 2014; Nikodem et al., 2022) temperature ranged from 34-38°C. According to Bartlett (2017), water temperature should be approximately 33-38 degrees Celsius, and temperature should be checked periodically. The warmth of the water keeps the mother warm and comfortable. The average skin temperature is between 33 and 37°C (Filingeri & Havenith, 2018). If the mother becomes dehydrated during labour due to higher water temperatures, the foetus will have a transitory rise in heart rate, which will only resolve if the mother cools down (Harper, 2014).

Assessment of Methodological Quality

Joanna Briggs Institute (JBI) serves as a guide on how to include various study types in systematic reviews that evaluate the efficacy of interventions, especially when evaluating the methodological quality or risk of bias of these studies (Munn et al., 2019). The JBI checklist for randomised controlled trials, quasi-experimental

studies, and cohort studies (Munn et al., 2019) was used to critically evaluate the papers. JBI is a widely recognised and regarded tool for evaluating the quality and validity of research investigations, notably in healthcare and evidence-based practise and the approach incorporate both levels of evidence and grades of recommendations which makes it ideal as an appraisal tool (Jordan et al., 2019). This study was evaluated for its methodological quality by assessing several key aspects, including robustness and reliability. Each of the three research designs, a randomised controlled trial, a quasi-experimental design, and a cohort study, was evaluated for its suitability for addressing the research question, taking into account its strengths and potential limitations. The sampling methods were examined for their representativeness and biases, ensuring that a comprehensive understanding of participant selection was achieved. To ensure their appropriateness for the study's objectives, the reliability and validity of data collection methodologies, such as the Visual Analogue Scale or VAS, the Childbirth Comfort Questionnaire and the Labour Agentry Scale, were assessed. As a measure of internal validity, potential sources of bias and confounding were identified and the study's strategies for addressing these issues were evaluated. The statistical methods used were evaluated for their appropriateness, transparency, and conformity to assumptions. Informed consent, participant confidentiality, and conflict of interest management were discussed to emphasise that all studies met ethical standards. As part of the external validity of the findings, the generalisability of the findings to various populations or contexts was considered. For the study to be able to detect meaningful effects, the sample size and statistical power were assessed. Additionally, it was noted that the peer-reviewed status of the study contributed to its credibility, due to its rigorous evaluation by experts in the field. Overall, this comprehensive assessment will provide an understanding of both the strengths and potential areas for improvement in the research design and execution.

Each criterion was scored as "yes", "no", "unclear" or "not applicable". The total number of questions marked as "yes" are tallied and divided by total number of questions in the JBI checklist. Questions pertaining to the design of the study, the population, the intervention, and the outcome details, as well as the quality of the statistical analysis, if it was appropriate. A cutoff score of over 70% was deemed sufficient for quality, while a score equal to or lower suggested some methodological limitations, according to George et al. (2014).

Critical Appraisal for Randomised-Controlled Trials

For the RCTs, to conceal the allocation of treatment groups placement, the studies randomised them using online number generator (Taskin & Ergin, 2021), computer software (Lee et al., 2013) and using computer generated cards (Nikodem et al., 2022).

All study participants' demographics did not differ statistically significantly between treatment groups (p>0.05). The two treatment groups also had no significant differences in other demographics. The participants in the study were therefore considered to be generally similar, irrespective of the treatment group. Participants and outcome assessors were blinded to the participants' treatment assignment in all studies. In Taskin & Ergin, 2021, it was not stated whether the person providing treatment was aware of the participant's treatment assignment. Participants in the study by Nikodem et al. (2022) are aware of the likelihood of being assigned to a treatment or control group, as they were told at the start that there is a 50% chance of being assigned to the treatment group. It must be noted, however, that the research assistant who explained it to them was not involved in the trial. Computer-generated random sequences sealed in opaque envelopes were used to randomize participants. Patients' identities were coded, and research assistants handled both groups' interventions in Lee et al. (2013). The researcher is therefore potentially blinded to the allocations.

There was no significant difference between the treatment groups in any of the studies, other than the intervention of interest. Nikodem et al. (2022) was the only study that had a complete follow-up since none of the participants withdrew from the study. 3 participants, however, left the hospital before completing the questionnaire. Several participants from both Lee et al (2013) and Taskin & Ergin, 2021 studies dropped out due to unexpected circumstances. Thus, in these studies, participants were analysed according to their initial randomisation.

In this way, the researcher was unable to anticipate the next participant's treatment group. It can be concluded that in all RCTs, the treatment groups were truly randomised for the participants. For each study, outcomes were assessed the same way for both treatment groups. The design of all three RCTs followed the standard RCT protocol. A comparison between the treatment groups confirmed that hydrotherapy is effective on the participants in a controlled setting, so the RCT design was appropriate in all the studies.

As Gupta (2011) points out, the ITT analysis includes all randomised patients irrespective of whether they followed the entry criteria, whether they received the treatment they were assigned, or if they subsequently withdrawn or deviated from the protocol. All three studies meet this criterion since complete outcome data are available for all randomised subjects. An ITT analysis preserves the sample size since excluding noncompliant subjects and dropouts from the final analysis may result in a reduction in the sample size, and thus a reduction in statistical power.

Critical Appraisal for Quasi-Experimental Studies

Studies that fall into the quasi-experimental category lack both a control group and a random assignment of study subjects (Schmidt & Brown, 2019, p. 177). They may, however, have a non-equivalent comparison group (Krishnan, 2019). It was clear from all studies that hydrotherapy caused pain reduction, and that it was also one of the effects.

According to the studies by Liu et al. (2014) and Tuncay et al. (2019), the demographic characteristics of the participants in both treatment groups did not differ significantly (p>0.05). The demographic characteristics of the participants in both treatment groups did not differ significantly between the studies conducted by Liu et al. (2014) and Tuncay et al. (2019). Additionally, neither study had any withdrawals from either group. Flow charts illustrating participants' flow were not included in Liu et al. (2014). The outcome table, however, indicates that the number of participants in both groups remained the same, indicating no loss of follow-up.

Liu et al. (2014) and Tuncay et al. (2019) found that hydrotherapy was the only treatment difference between experimental and comparison groups. In Tuncay et al. (2019), the experimental group received a warm shower, while the comparison group received routine hospital procedures. In both groups, the Birth Follow-up Questionnaire and Postpartum Parenting Behaviour Scale were administered at 12 hours. Similarly, for Liu et al. (2014), the experimental group received water immersion while comparison group underwent conventional labour and delivery. Therefore, it may be concluded that both treatment groups received similar treatment other than the exposure of interest.

Critical Appraisal for Cross-Sectional Study

In evaluating a cross-sectional study (Kolivand et al., 2014) that compares the outcomes of waterbirth and normal vaginal delivery, several critical aspects were examined methodically. Study objectives, aimed at assessing and comparing the outcomes of two birthing methods, were clearly stated, and aligned with the cross-sectional design. While the sampling strategy provided an overview of participants during a specific period of 1 year, it had limitations in capturing the temporal dynamics related to childbirth. It is unknown regarding the selection of participants as it was only stated as randomly selected from a pool of eligible participants in Kermanshah Motazedi Hospital. Validated and standardized outcome measures for both waterbirth and normal vaginal delivery demonstrated a commitment to internal validity. However, due to the nature of the study's cross-sectional nature, causal relationships were not established, and the dynamic process of labor and delivery was not captured comprehensively.

The consideration of bias was paramount in the critical appraisal. It was acknowledged that there was a possibility of selection bias, since participants self-selected into the groups of waterbirth or normal vaginal delivery. The study also addressed ethical considerations, ensuring participant confidentiality, and obtaining informed consent. However, the cross-sectional approach limited the ability to capture longitudinal aspects of participant experiences, potentially influencing ethical considerations.

This study provides valuable insight into the immediate outcomes of waterbirth compared to normal vaginal delivery, but caution should be exercised in interpreting its findings. Due to the inherent limitations of the cross-sectional design, definitive conclusions cannot be drawn about causation or the long-term impact of birthing choices. Prospective longitudinal studies may provide a more robust framework for capturing the dynamic nature of childbirth experiences and revealing the cause-and-effect relationships involved. It's important to emphasise the study's contribution while emphasising the need for more research methodologies that can provide a better understanding of the outcomes associated with waterbirth versus normal vaginal delivery.

Data Extraction

The data extraction process was standardized and predefined to ensure consistency across studies. Warm showers and immersion in water are compared to determine the benefits and potential differences in pain relief, comfort, and overall satisfaction. The two methods are forms of hydrotherapy commonly used during labour to enhance relaxation and manage pain. Showers are a convenient option because they are easy to access and require little setup.

Type of water birth

The term hydrotherapy was used in several studies to describe participants who immersed themselves in warm water tubs (Kolivand et al., 2014; Liu et al., 2014; Nikodem et al., 2022; Tuncay et al., 2019). Other studies used warm showers as a form of hydrotherapy (Lee et al., 2013; Taskin & Ergin, 2021). By immersing the entire body in water, hyperthermic action is induced to increase blood flow and vasodilation, supplying more oxygen and nutrients to the peripheral tissues, which warm the superficial vessels of the body, thus increasing the depth of the body through circulation (Goto et al., 2018). A steady flow of warm water can ease tension, relax muscles, and alleviate discomfort. A woman in labour has the option of adjusting the water temperature according to her preferences. The shower allows for a degree of movement and allows the stream of water to be directed to areas

of the body that are experiencing pain. Submerging in warm water can provide buoyancy, reduce gravity's pull on the body, and possibly ease the intensity of contractions. The experience of immersion is considered by some to be more immersive and soothing than that of a warm shower.

Type of assessment tools

A variety of assessment tools have been used to assess the efficacy of hydrotherapy and conventional birthing methods, including subjective self-report measures, clinical observations, and objective data. The birthing person's pain intensity can be measured with a Visual Analog Scale (VAS) or Numeric Rating Scale (NRS) during both warm showers and water immersion, enabling a quantifiable assessment (Lee et al., 2013; Liu et al., 2014; Taski & Ergin, 2021; Tuncay et al., 2019) Interviews or questionnaires are often used to collect qualitative data, which allows the birthing person to self-report their experiences, including overall satisfaction, relaxation, and perceived effectiveness (Taskin & Ergin, 2021). Healthcare providers monitor vital signs, signs of distress or relaxation, and the progression of contractions during clinical observations. The labour and delivery record provides valuable information about labour duration, complications, and interventions (Tuncay et al., 2019. Assessments of maternal and neonatal outcomes following delivery contribute to understanding the broader impact of warm showers and water immersion during birth (Kolivand et al., 2014; Liu et al., 2014; Tuncay et al., 2019). By considering both subjective experiences and objective clinical measures, this multifaceted approach ensures a thorough evaluation, providing insightful insight into the efficacy and safety of these hydrotherapy methods during labour.

In a study by Tavakol and Dennick (2011), Cronbach's alpha assesses the internal consistency reliability of a scale that comprises multiple items or questions. It quantifies the extent to which items within the scale are correlated with each other. A high Cronbach's alpha value (typically ranging from 0 to 1) indicates greater internal consistency, suggesting the items in the scale are highly correlated and reliable. However, the Visual Analogue Scale (VAS), does not have a Cronbach's alpha value. As it is a single-item scale rather than a multi-item scale. Cronbach's alpha is designed to assess scales with multiple items, and therefore, it is not applicable to single-item measures like the VAS. Instead, the reliability and validity of VAS are typically established through test-retest reliability and concurrent validity studies which evaluate its consistency and accuracy in measuring pain intensity across different contexts and populations. The assessment instruments used in the included studies were generally reliable as evidenced by a reasonable range of Cronbach's alpha values. In 2003, Kerri, Drunell, and Schuiling created the Childbirth Comfort Questionnaire. An alpha value of 0.71 has been calculated for Cronbach's alpha (Schuiling, 2003). For the Labour Agentry Scale, an alpha value of 0.87 was noted in Tuncay et al. (2019) study.

Synthesis of Findings (Themes)

A summary of the key findings from each of the six included studies was compiled in Appendix F. The results of the six included studies were then synthesized. Organizing key information and identifying relevant findings prior to this step is essential since it allows a better understanding of the topic to be achieved (Berg et al., 2013). There is an association between hydrotherapy and pain score, labour time, and water temperature based on the included studies. The thematic table can be found in Table 3.

Table 3. *Thematic Synthesis*

Authors	Theme 1 Reduced pain	Theme 2 Shorter labour time	Theme 3 Water temperatures
Lee et al., 2013	✓		✓
Liu et al., 2014	✓		✓
Kolivand et al., 2014			✓
Nikodem et al., 2022	✓		✓
Taskin & Ergin, 2021	✓	✓	✓
Tuncay et al., 2017	✓	✓	✓

Reduced pain

Hydrotherapy was found to have reduced the pain felt by women during birth in 5 studies (Lee et al., 2013; Liu et al., 2019; Nikodem et al., 2022; Taskin & Ergin, 2021; Tuncay et al., 2019). According to the studies, there was a significant difference in terms of the VAS scores between the two groups. Only 1 study by Kolivand

et al. 2014, did not mention on the VAS scores. However, it did mention that there was a lesser need for the use of pain relief in the study group as compared to the control group.

Shorter labour time

Hydrotherapy has, however, received mixed reviews when it comes to its effect on the duration of labour. Tuncay et al. (2019) found a statistically significant difference between the two groups during the second phase (p=0.001). Similarly, Taskin & Ergin (2021) reported statistically significant differences between the two groups at both the active and transition phases (p>.05. In contrast, Kolivand et al. (2014), Liu et al. (2014), and Nikodem et al. (2022), found that labour durations were similar between the two groups (p>0.05).

Water temperatures

In all the included studies, the temperature of the water used for hydrotherapy varied between 34 and 38 degrees Celsius (Lee et al., 2012; Liu et al., 2014; Kolivand et al., 2014; Nikodem et al., 2022; Taskin & Ergin, 2021; Tunay et al., 2017).Only four studies achieved constant temperatures during the labour period (Lee et al., 2013; Kolivand et al., 2014; Taskin & Ergin, 2021; Tuncay et al., 2019). A bath thermometer was used to monitor the temperature on a regular basis. It was checked every five minutes to every fifteen minutes to every hour. Liu et al. (2014) and Nikodem et al. (2022), however, did not mention whether steps were taken to maintain a constant bath temperature.

III. Discussion

Several studies have demonstrated that applying hydrotherapy for at least 20–30 min during labour at a temperature of 37–38°C increases blood circulation, muscle relaxation, and endorphin levels, lowering pain and increasing mother satisfaction during birth (Liu et al., 2014; Nikodem et al., 2022; Taskın & Ergin, 2019; Tuncay et al., 2019). This is further supported by a study done by Czech et al. (2018), where there was a reduction in the need of epidural. In addition, hydrotherapy during labour has been shown to decrease catecholamine production, reduce the need for analgesics as well as reduce the risk of operative childbirth and anxiety (Taskin & Ergin, 2021; Tuncay et al., 2019). It was worth nothing that in Kolivand et al., 2014, that the control group requires a higher demand for pain relief. Furthermore, it has been stated that hydrotherapy has no effect on neonatal outcomes (Taskin & Ergin, 2021). In the birthing process, pain management is of utmost importance. Hydrotherapy, whether in the form of warm showers or immersion in water, holds promise in providing significant relief, according to multiple studies. Water's buoyancy and warmth seem to create an environment conducive to muscle relaxation, which mitigates the intensity of contractions and offers relief to those in labour. It is not only a significant physical improvement that reduces pain, but it also has profound implications for the overall experience of childbirth. Ultimately, this contributes to a more positive and empowering journey. Furthermore, the observation of shorter labour times suggests that hydrotherapy is beneficial to the progression of labour. It would be worthwhile to investigate further the potential physiological mechanisms behind these effects.

Despite these promising findings, we need more rigorous research, including randomised controlled trials with larger sample sizes, to build a more robust evidence base. Nevertheless, consistent reports of reduced pain and shortened delivery times argue in favour of incorporating hydrotherapy into the continuum of supportive measures for labourers.

Research Gaps

Hydrotherapy is unquestionably beneficial in terms of reducing pain and shortening labour times, but it is also important to determine how it impacts maternal satisfaction, autonomy, and emotional well-being. Holistic approaches to birthing care consider not only the physiological factors, but also the subjective experiences of the birthing woman, emphasising the need for patient-centred care. Some research gaps were observed throughout this review. The studies that were included in this research originated from Asian, Islamic, and European countries. It is possible that there are cultural differences in terms of practices, beliefs, or acceptance of hydrotherapy among clinical stakeholders (Benfield et al., 2018). There were also studies in which participants could choose their preferred birthing methods rather than being randomly assigned, which may have led to biased results (Liu et al., 2014). They might be blinded by treatment effects, because they expected a better outcome for a certain intervention, but it didn't meet their expectations, so they might share their experiences with a biased viewpoint. Additionally, the temperature of the water differs from studies. Some studies took measurements to ensure constant temperature. However, it was unclear if the room temperature affects the research findings as mentioned in Lee et al, (2013).

IV. Conclusion

In conclusion, the study of warm showers for labour and immersion in water for labour comprises a multidimensional analysis of their potential impact on the birthing process. Based on the literature, both methods

have demonstrated subjective advantages, including pain reduction and a reduction in labour time. There remain, however, a few research gaps, particularly regarding long-term outcomes, variation in water birth practices, and a comparison of the effectiveness of hydrotherapy and conventional birth methods. Further investigation is required regarding the psychosocial aspects of maternal satisfaction and experience as well as their potential impact on health care resources. A more comprehensive understanding of neonatal outcomes requires studies involving diverse populations. Further, future research should explore the combination of therapies and their interactions. A comprehensive understanding of the role of warm showers and immersion in water during labour must be achieved to advance evidence-based practices in maternal care. A substantial amount of further research, particularly well-designed randomised controlled trials, and studies with diverse and inclusive populations, will be necessary to refine guidelines and improve the quality of delivery care.

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