

**USING AROMATHERAPY AND HYDROTHERAPY
IN OBSTETRICS CARE – STUDY ON LABOURING WOMEN'S
PERCEPTIONS**

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USING AROMATHERAPY AND HYDROTHERAPY IN OBSTETRIC CARE - STUDY ON LABOURING WOMEN'S PERCEPTIONS

Complementary and alternative medicines and therapies have already been part of obstetrics for a long time. Nowadays, they are getting more and more popular. In some countries and hospitals complementary and alternative medicine is still widely discussed topic. It would help to launch a thorough research in this field to eliminate the polemic.

The general aim of the study is to explore the perceived effectiveness of aromatherapy and/or hydrotherapy during childbirth by women in labour. The specific aims of the study were to describe basic childbirth related characteristics of the participants, explore perceptions of the study participants on aromatherapy and/or hydrotherapy and explore reasons why aromatherapy and/or hydrotherapy were used in child labour.

Cross sectional study was carried out in delivery ward of Hospital of Merciful Brothers, Brno, Czech Republic. The study was performed with questionnaires, which contained two parts. The first part was filled by medical staff (midwives or medical doctors) and the second part by labouring woman not more than 12 hours after labour. Perceived effectiveness of aromatherapy and/or hydrotherapy of thirty women was explored as well as specific reasons why aromatherapy and/or hydrotherapy were introduced. Factors which could influence women's perception were studied as well.

The mean average age of participants was 31.2 years. The majority of participants were primiparas (50.0%). The most often used therapy was hydrotherapy (56.7%) and aromatherapy combined with hydrotherapy (40.0%). The majority of the participants subjectively perceived their therapies (aromatherapy and hydrotherapy) positively (86.7%). The rest of the respondents perceived the above therapies neither positively nor negatively (13.3%).

Most of the respondents (40%) mentioned that the pain relief was the biggest influence of aromatherapy and/or hydrotherapy. The most common reason for hydrotherapy and/or aromatherapy use was midwife's recommendation (83.3%) or knowledge gained by self-study (40.0%).

Results of this study showed that commonly used methods of aromatherapy and/or hydrotherapy were met with contentment. It also revealed that women's perception of hydrotherapy and aromatherapy is positive especially in the role of pain management and relaxation.

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ABBREVIATIONS

CAM – Complementary and alternative medicine

NICU – Newborn intensive care unit

PMS – Premenstrual syndrome

WHO – World Health organization

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1 INTRODUCTION

The rise of holistic approaches in patient care, and promotion of interactive relationship between the medical profession and the populace has also affected algiatry, a discipline within the field of medicine which specializes in pain management. Although the algiatrist continues to serve mostly as a consultant to other physicians, the position increasingly involves not just the prescribing of medication, but rehabilitative services and counselling that considers the cultural and historical contexts of patients. In many countries where orthodox (western) practice is the mainstream of medicine, complementary and alternative medicines (CAM) are also being used e.g. in pain management.

In the Czech Republic 92% of pregnant women are receiving prenatal care and 99.9% of labours are attended by skilled medical staff (The World Bank 2010). Maternal mortality was 5% in 2013 and infant mortality was 1.8% in 2011, which was one of the lowest in the world (The World Bank 2013).

Despite these positive statistics, obstetrics in the Czech Republic have been exposed to widespread polemics within the last few years. Most of the labours are placed in hospital settings, a practice that is criticized by the supporters of natural ways of labour as well as by the supporters of home labours. Home labour is considered as a procedure non lege artis in the Czech Republic. Natural labour is a labour when no medical interventions and no drugs are used and this is becoming very popular. As a result of the above, CAM was introduced in many hospitals and the use of it became routine in lots of delivery wards. The fact is that some medical staff and also public are still questioning the effectiveness of CAM due to the lack of proper scientific research and corresponding data.

This research sets out to examine the use of CAM in the Czech Republic, specifically the areas of aromatherapy and hydrotherapy, and to explore how women perceive the effectiveness of these therapies in the field intra-partum care in hospital setting. This research also elucidates this area to medical professionals and public interested in the topic of CAM in obstetrics. However, detailed scientific research is needed to bring CAM into mainstream treatment options.

2 LITERATURE REVIEW

2.1 Complementary and Alternative Medicine

The terms complementary and alternative medicine (hereafter referred to by the acronym CAM) are often used interchangeably in medical literature. The available literature regarding alternative medicine defines the practice in different ways. Within countries that still practice traditional forms of medicine, the terms CAM refer to practices that are not a part of that country's own tradition, and are yet to be integrated into the mainstream health care system (Zhang 2000).

2.1.1 History of complementary and alternative medicine

The term “complementary medicine” appeared quite recently. In the past century, Western countries have more often supported a scientific and evidence-based approach to medicine that relies heavily on manufactured pharmaceuticals and invasive procedures. The idea to combine this form of more conventional medicine with complementary methods did not gain popularity until the end of the 20th century. Unconventional therapies were already used before 1990. Despite this, these alternative methods were not recognized by practitioners of conventional medicine, who viewed them as oppositional. The term “alternative” has been used since 1970s, but still it is not accepted by medical practitioners (Wayne & Levin 1999).

Allopathic medicine is an expression commonly used by homeopaths and the expression was for the first time used by Samuel Hahnemann. It means that opposite is treated by opposite (for instance constipation is treated by laxatives, fever is treated by antipyretics etc.). It is an opposite of homeopathy, where the main principle is that similar is treated by similar (substance, that causes the disease is used also for its treatment, in diluted volume) (Vokurka & Hugo 2000). The term allopathic was never accepted as a mainstream scientific term, it was adopted by alternative medicine advocates to refer pejoratively to conventional medicine (Whorton 2004).

Perhaps due to disregard by those educated in conventional methods within the medical

community, pejorative terms for alternative medicine sprang up, such as irregular medicine, medical cultism, quackery etc. Even though CAM is more widely accepted nowadays, barriers still lay ahead and a complete break with the depreciatory past may not be possible (Wayne & Levin 1999).

In the book *Alternative Medicine? A History* (2008) author Roberta Bivins states: “There can be no history of alternative medicine, only a history of the rise to dominance of scientific medicine” This is a harsh statement to make and seems to assume that alternative medicine never developed, and thus has no history of its own.

Other authors are less strict, like James C. Whorton who divided the history of alternative medicine in the United States into three main streams. The first stream came in the early 19th century and consisted of the Thomsonians, homeopaths, and hydropaths. Homeopaths and hydropaths were most popular during this period, although Thomsonians also abounded. Thomsonians used different herbal remedies from the homeopaths and had exact rules regarding the use of these remedies and to whom they could be given (Flannery 2002).

The second stream emerged at the beginning of the 20th century and was represented by osteopaths and chiropractors. Osteopathy was elaborated in 1894 by Andrew Taylor. According to him all diseases, including infection diseases, are caused by spinal malfunction. Osteopathy is based on using soft manipulative techniques such as massages. Osteopathy could be defined as a method, which is somewhere at the crossroads of alternative and scientific medicine (Heřt et al. 1995). Chiropractors are generally using spine’s manipulation for treating diseases. This method is based on theory according to which majority of different illnesses is caused by wrong bones positions (Vokurka & Hugo 2000).

The third and final stream arrived in the late 20th century, during which a holistic healthcare approach expanded and older methods of treatment such as acupuncture and homeopathy were rediscovered and re-employed (Flannery 2002).

Perhaps the most well-known alternative medicine is homeopathy, which appeared at the forefront of each stream. Homeopathy was formulated by German doctor Samuel Hahneman in the seventies. It was followed by hydrotherapy (presently called hydrotherapy), magnetic therapy and others (Wayne & Levin 1999).

2.1.2 Complementary and alternative medicine in women's health and the delivery settings

The use of different unconventional therapies is increasing and there is a wide range of interventions available for women during pregnancy and labour (Zwelling et al. 2006). In the United States, women of reproductive age constitute the largest group of regular users of CAM. This statement is also supported by midwives, who are recommending CAM to their pregnant patients (Allaire et al. 2000).

Pregnancy is a time of heightened emotions for many women. It is a time of great joy and anticipation, but it may also trigger worries, doubts, and fears of future. These feelings of anxiety can be especially noticeable in women who underwent assisted reproductive techniques in order to conceive, and who are very concerned about the wellbeing of the foetus. CAM is viewed by many in the general public to be natural and harmless, and this may be a contributing factor in its popularity among pregnant women. Other reasons may include dissatisfaction with conventional medicine, issues with side effects of pharmaceuticals, and the desire to have a "natural" pregnancy and childbirth experience (Kalder et al. 2011).

However, CAM is not without disadvantages. For example, acupuncture has been reported to cause pneumothorax and vascular injuries as well as spinal cord lesions. Allergic reactions to substances used in homeopathy and aromatherapy are also possible (Munstedt et al. 2009). Furthermore, a study conducted in 2008 found a 30% lower ongoing pregnancy/life birth rate during a 12 month period of infertility treatment while using CAM (Bolvin & Schmidt 2009). Nevertheless it was not described which type of CAM was primarily associated with this phenomenon.

CAM methods are recommended and practised more often by midwives than medical doctors. CAM was most frequently used after health care provider's recommendation (mostly midwives) or after previous positive experience (Table 1.). The main problems treated by CAM were nausea and musculoskeletal pain (Table 2.). However, there are several other reasons cited for using CAM by pregnant women, among them stimulation of labour and maternal relaxation in labour (Allaire 2001).

Table 1: Most common reasons for using CAM in pregnancy (Allaire 2001)

Reason for using CAM in pregnancy	Number of agreements given n (%)
Good experiences earlier in pregnancy	51 (24.9%)
Advice of friends	19 (9.3%)
Positive information from the media	20 (9.8%)
Appealing mode of CAM action	13 (6.3%)
Desire to exhaust all possibilities	15 (7.3%)
Failure of conventional medicines	9 (4.4%)
Desire for any kind of treatment	2 (1.0)
Advice of any therapist:	61 (29.8%)
Physician	25 (12.2%)
Midwife	44 (21.5%)
Healthcare practitioner	7 (3.4%)

Table 2: Most common problems during pregnancy treated by CAM (Allaire 2001)

Most common problems during pregnancy	Number of agreements given n (%)
Depressive mood	37 (18%)
Imminent miscarriage (<i>abortus imminens</i>)	23 (11.2%)
Premature labour	56 (27.3%)
Non-vertex presentation of the baby	28 (13.7%)
Musculoskeletal pain	99 (48.3%)
Nausea/vomiting	123 (60%)

According to Kadler et al. (2011) CAM methods are used worldwide but most widespread use is found in Germany, the United States, Great Britain, and Australia, where not surprisingly most of the research is also conducted. Homeopathy, acupuncture and aromatherapy are the most frequently used CAM methods in German obstetrics. However, even in Germany, a country with a long history of medical research, studies on the topic of obstetrics and CAM are limited, sparse, and underdeveloped when compared to oncology, where the effects of CAM methods are carefully monitored and documented (Munstedt et al. 2009).

Implementing of CAM in obstetrics requires careful planning, a good breadth of knowledge by health care providers and a willingness to practise CAM methods. Hospitals equipped with the latest technology who wish to serve women in labour must also provide space for CAM therapies such as music therapy, hydrotherapy and massage (Zwelling et al. 2006).

Like conventional medicine, there are factors that influence the efficacy of CAM methods. Research conducted by Münsterdt and his colleagues (2009) came upon a surprising result during their study; the type of maternity ward, concerning number of deliveries/beds and size of hospital, does not influence the proportion of women receiving CAM treatments. A significant relationship was seen between the perceived effectiveness of the CAM method use and the proportion of patients receiving it.

Kalder and his colleagues (2009) analysed factors which could predict the use of CAM during the pregnancy. It was found out that marital status, age, weight, body mass index, place of the residence, gravidity and parity, use and/or misuse of alcohol and tobacco, and occurrence of problems during pregnancy were not associated with use of CAM during the pregnancy and delivery. Predictors of CAM use during pregnancy were nationality, greater income, higher education, and previous CAM use prior to pregnancy. The same predictors were found in labouring women. Unfortunately, CAM therapies have been not sufficiently studied to determine their efficiency and safety for pregnant women. More research is needed in this area (Allaire 2001).

2.2 Aromatherapy

Aromatherapy is a care-based and hands-on therapy which seeks to induce relaxation and reduce stress, increase energy and to restore balance to the mind, body and soul through the use of scent. (Tisserand 1987) One expert on the subject defines aromatherapy as: "a science and an art, in which essential oils derived from plant sources are used for their therapeutic properties" (Tiran 1996). It is believed that these therapeutic properties can treat physical and psychological ailments through their odours, as scents can provoke certain psychological, spiritual or emotional reactions in the human body (Herz 2009).

Over 3000 different essential oils are known, and these consist of thousands different substances, which can pleasantly affect human olfactory sense. Essential oils can be administered through the skin in the form of massage, bath or compress. They can also be administered via olfactory system through inhalation or mucous membranes. In special cases it is also possible to administrate essential oils via the gastrointestinal tract, but this is quite rare and done by qualified aroma therapists, who can also be medical doctors (Zárubecká & Ašenbrenerová 2008.). Essential oils are fat soluble and the most rapid absorption is by inhalation. They are excreted through the kidneys or exhaled through the lungs (Zwelling et al. 2006).

There are two different terms used within this method: aromatherapy and aromacology. Aromacology is a term which was first coined by the Sense of Smell Institute and is a field which is scientifically supported. Aromacology studies the olfactory effects on mood, physiology and behaviour. Additionally, aromacology research must meet demanding empirical criteria (Herz 2009). According to scientists, olfactory sense is the only sense which is tied to the brain's limbic system, and for this reason certain aromas can decrease tiredness and stress and improve mood (Zárubecká & Ašenberenerová 2008).

The therapeutic effects of aromatherapy are illustrated in the use of sandalwood. Sandalwood aroma has a sedative and calming effect which is used for treating depression, anxiety, and sleeping problems. Lavender also has healing properties similar to sandalwood. Rosemary, another essential oil derived from a plant, is believed to stimulate memory and clear the mind (Herz 2009). However, the effects of essential oils can

sometimes be contradictory; such as the case of juniper oil, which is said to have seventeen different effects ranging from aphrodisiac to sedative (Price 1991).

It is quite difficult to make aromatherapy research because of the vast array of essential oils and each of their multipurpose uses. The exact mechanism of aromatherapy is still not known and many theories abound regarding how and if it works. There is a lack of information about the interaction of essential oils with one another and with conventional medicines and treatments. These are all complicating factors in the study of aromatherapy.

2.2.1 History of aromatherapy

The therapeutic use of plants and their essential oils has been used for thousands of years by ancient Native Americans, Indians, Egyptians and Chinese peoples. Each of these cultures used essential oils as healing agents, medicines, and deodorants. For thousands of years, traditional Chinese medicine has utilized herbs and plant oils as do ayurvedic practices from India. Mummification, for example, was performed with the aid of several essential oils such as myrrh, frankincense, cinnamon, cedar, and juniper. It is also rumoured that Cleopatra seduced Marcus Antonius with help of a perfume she made herself from essential oils (Tiran 1996).

The knowledge of aromatherapy was adopted by ancient Greeks and soon after by ancient Romans. Around the year 100 AD, a Persian doctor named Ibn Sina, also known as Avicenna, discovered a way to distil essential oils and he wrote several texts about the process. The Christian Bible also mentions aromatherapy practices where essential oils were used when Mary Magdalen anointed Jesus' foot with spikenard ointment. During the Middle Ages, herbs and essential oils were used very frequently. Many people attempted to ward off the Black Death with concoctions of spices, plants, and herbs.

However the first real use of the term "aromatherapy" was in early 20th century by French medical doctor and chemist Rene-Maurice Gattefosse (b. 1881, d. 1950). In 1936, there was an explosion in his laboratory and he accidentally burned his hands. He immersed his burned hands in lavender oil and was surprised by its positive wound healing capabilities, as well as antibacterial and analgesic properties.

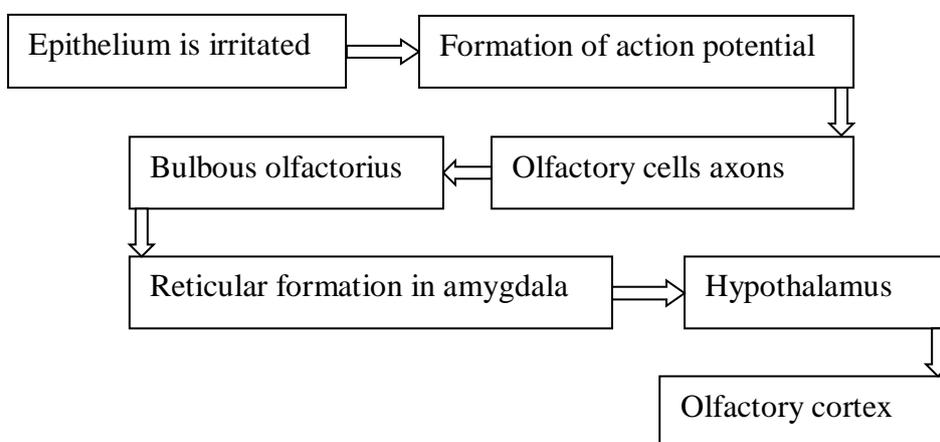
The importance of herbs in medicine decreased due to industrialization in later years. Urbanization also impaired access to nature and herbs for everyday people, and the chemical and pharmaceutical manufacturing industries also developed, leading to their favour over older and more traditional methods. In recent decades, scientists in Western countries started searching for new options of treatment and herbs and essential oils again became popular.

The herbs and essential oils that were commonly used in the past in obstetrics fell out of favour as the profession become more doctor-dominated, and thus also a man profession. Midwives position of authority in the field of obstetrics fell below that of medical doctors and the old herbal remedies were believed to be useless and natural methods came to be viewed as a form of witchcraft. This unfounded belief remained in existence until the late twentieth century, when the use of plants and essential oils was reinstated.

2.2.2 How are aromas perceived and physiology of the Olfactory System

The olfactory tissue (regio olfactoria) is located in the dorsal part of the nasal cavity. It has a yellowish colour and is thinner than surrounding tissues (regio respiratoria). The olfactory active substances – odorants – first enter the cilia through the mucus, which contains special proteins with ability to bind odorants. The hydrophobic and lypophylic odorants become water soluble. The mechanism of action is as follows:

Picture 1: Physiology of perceiving aromas (Trojan & Langmeier 2004)



It should be noted that aromatic molecules can also enter through the throat and thus get into the blood stream.

Humans have quite a well-developed olfactory system, although it pales in comparison to other vertebrates such as dogs (220 million receptors) or rabbits (100 million receptors). Humans have approximately 40 million olfactory receptors which can detect around ten thousand different aromas (Cunningham et al. 1999).

2.2.3 Differences in perceiving the aromas

An old saying goes “scent is the strongest sense tied to memory”. The sense of smell is the most powerful of all human senses and scent memory can be lifelong (Stephen 1994). The human brain’s ability to recognize a scent is so powerful, that just one exposure is enough to set a smell to memory. Even new-borns are able to recognize odours and the smell of their own mother. It also has been proven through research that women’s olfactory system is more sensitive than men’s olfactory system. A woman’s sensitivity to aromas increases during ovulation (Hirsch 1992). Olfactory thresholds vary from individual to individual and are influenced by a variety of factors such as environment, life style (smoking), age, disease, and others.

One study found that there was a difference in preference of aromas based on age. Feelings of pleasant nostalgia were evoked most by the smell of flowers, fresh air, cut grass, and meadows for those born before 1930. However, those born between 1930 and 1980 preferred completely different smells such as hair spray, baby aspirin, suntan oil, cocoa puffs, and for some, also marijuana. The author of the research theorized if in the future the preference and perception of natural environmental aromas might be reduced (Hirsch 1992).

Odours can be used in innumerable ways. Scents help to calm hyperactive children or children with learning difficulties. They can be used also as a supportive part of nonverbal therapeutic techniques. For instance, the smells of forest, camp fire, grass, and blossoming trees can put people at ease and increase their concentration, thus supporting the therapist’s spoken word in a nonverbal manner.

Different aromas can be used in different situations, and the importance of smell and its effect on mood are increasingly being recognized (Tiran 1996).

2.2.4 Aromatherapy in women's health and the delivery setting

The use of aromatherapy in women's health can be divided into two main groups: gynaecology and obstetrics. Non-pregnant women suffering from inflammations, cancer, premenstrual syndrome (PMS), infertility, and problems associated with menopause compose the gynaecological group. Pregnant and labouring women as well as new mothers make up the second, obstetrical group.

It is of great importance to match the right oil with the clinical picture of the disease and/or problem. Some of the essential oils can be irritating to the skin or mucosa so application of the substance in a small portion before administering a full dose should be done to check for allergic reactions or adverse effects. It is common practise to mix essential oils with carrier oils. Carrier's oils have larger molecules and are long-chain fatty acids. It is possible to concoct mixtures of up to three different oils to treat specific problems, although the client's smell preferences must also be considered (Tillett & Ames 2010).

Based on several researches here are usually several oils which can be used to treat a specific problem. The route of administration varies depending on the stated ailment and its symptoms. For example a woman who is suffering from tension and emotional as well as physical stress associated with PMS may use neroli, clary sage, or ylang ylang essences topically with massage. A woman suffering from excess fluid retention associated with PMS should use juniper or lavender oil in a bath. PMS - related breast tenderness can use geranium or juniper oils applied topically in massage form (Tillett & Ames 2010).

During pregnancy, essential oils can be used to reduce stress and anxiety and also to alleviate physical symptoms such as backache, swelling and inflammation. Chamomile is useful to treat backache, geranium relieves stress and anxiety, and ylang ylang improves mood while also having a calming effect (Zárubecká & Ašenbrenerová 2008).

Much as during pregnancy, aromatherapy is used during labour to achieve relief from stress, anxiety and pain. The most common routes of administration are through inhalation, bath or topical massage. Anxiety and stress can increase women's perception of pain or even protract the labour and thus increase the amount of different and invasive medical interventions that are needed. Aromatherapy is offered predominantly by midwives, not medical doctors.

Examples of essential oils commonly used in the delivery setting are clary sage to increase intensity of contractions, lavender to alleviate pain and mood, mandarin and neroli to induce relaxation and peppermint to reduce nausea and vomiting (Tillett & Ames 2010).

In the year 2000, a study of 8058 mothers showed a positive correlation regarding the efficacy rates of particular oils used within a clinical setting. For pain reduction, lavender oil was evaluated positively by 54% of mothers and frankincense oil by 64% mothers who used it in the clinical setting. Clary sage, used to increase contractions, was not rated very well by mothers as only 36% mothers considered it as helpful. Peppermint oil, which was used to reduce nausea and vomiting, was rated as helpful by 54% mothers who did not have epidural analgesia. 1% mothers participating in the study reported adverse side effects; however their symptoms are commonly reported during labour so the study authors were not able to determine whether or not these side effects were due to aromatherapy. Similarly, a British study found that that aromatherapy was viewed as a positive technique by 50% of mothers, whereas only 14% of mothers found it unhelpful. During the years of the study the use of pethidine during labour decreased from 6% to 0.2%. The study showed that aromatherapy could be beneficial for women in a protracted labour (Burns et al. 2000).

A separate study conducted by Burns (2009) focused on the use of aromatherapy in labour and if it affected delivery outcomes. The researchers wanted to determine if women who used aromatherapy during labour had different delivery and neonatal outcomes compared to those women who did not receive any aromatherapy interventions. The delivery and neonatal outcomes included need for an unplanned caesarean section, operative delivery, spontaneous vaginal delivery, artificial rupture of membranes, episiotomy, pharmacological pain relief, new-born Apgar scores and need to transport new-born to Neonatal Intensive Care Unit. There were no significant differences noted in the outcomes for delivery concerning caesarean section, vacuum extraction, spontaneous vaginal delivery, first or

second stage augmentation, or use of Kristeller Manoeuvre. Use of pharmacological pain killers and pain perception was noticeably reduced in the aromatherapy group of primiparas. However there were also more women in the aromatherapy group whose new-borns had to be transferred to the new-born intensive care unit, although the researchers also mentioned that the study was weak and needed additional corroborative evidence.

One systematic review concluded that aromatherapy played no role in reducing pain during labour when compared to women who did not receive the treatment. The study authors also wrote that more evidence of the effects of aromatherapy is needed as well as more substantiated studies (Smith et al. 2006). Similarly Korean study concluded that anxiety and stress were not reduced in labouring mothers receiving aromatherapy (Münstedt et al. 2009).

The same uncertain conclusion is in another systematic review in which aromatherapy effects were evaluated. Primary, other and secondary outcomes were evaluated. Primary outcomes included effects of interventions (pain intensity, satisfaction with childbirth experience) and safety interventions (breastfeeding, caesarean section, new-born's Apgar score). Other Outcomes evaluated the cost of intervention and secondary outcomes evaluated maternal (length of labour, need for oxytocin, perineal trauma) and neonatal (need for ventilation, neonatal encephalopathy) outcomes. No significant differences were noted between the aromatherapy group and the control group in most of the evaluated outcomes. The results of aromatherapy effectiveness in this study were inconclusive and the authors recommended further research to provide sufficient proof (Smith et al. 2011).

2.2.5 Contraindications of aromatherapy

Of importance to note is that the use of certain essential oils can be contraindicated with other holistic remedies and/or prescription medications. It has been proven that clary sage and fennel have estrogen-like properties, which is a reason why their use is not recommended for women who have estrogen-receptor positive breast cancer (Tillet & Ames 2010).

Some of the oils are strictly contraindicated during the pregnancy and labour.

Aromatherapists should be well versed in the potential risks and benefits of essential oils and their usages. Aromatherapy is not recommended for use during the first trimester as a woman's increased sensitivity to odours may induce nausea and vomiting. Yet it is possible to make exceptions in certain situations, for example in treating early gestosis (emesis gravidarum, hyperemesis gravidarum and ptyalism). Some of the essential oils can have teratogenic, mutagenic, emmenagogic, or abortive effects and these must be avoided during the entire pregnancy (Tillet & Ames 2010). Rosemary (*rosmarinus officinalis*) or *salvia lavandulifolia* can have abortive effects, *Juniperus sabina* might have teratogenic effect, and however those essential oils are not commonly used in delivery settings (Balchin 2006).

2.3 Hydrotherapy

Hydrotherapy was formerly called hydrotherapy, which derives from Latin and can be directly translated as "water-cure". The aim of hydrotherapy is treatment of illness or relief from pain and/or stress. Hydrotherapy involves immersion in water and its form of administration is through hot, cold or warm baths.

Pressure and temperature are used to achieve therapeutic effects. Often time stimulation of blood circulation is at the forefront of treating symptoms of diseases. All forms of hydrotherapy utilize water in the form of liquid, steam, or compresses. Hydrotherapy can be defined as "application of water, externally or internally, as a therapeutic method in the treatment of disease" (Wayne & Levin 1999).

2.3.1. History of hydrotherapy

According to the International Spa Association, hydrotherapy has been practised for centuries, especially in European spas where mineral waters were used in different forms including mineral baths (such as balneotherapy, Scotch hose, Swiss shower) and in the form of hot springs. For centuries, people have travelled to natural spas, such as those in the Czech Republic's Karlovy Vary hot springs, in search of healing and stress relief. More modern hydrotherapy forms include underwater massage from jets such as in Jacuzzis and hot tubs.

The first mention of hydrotherapy came in the 5th century BC when Greek physician Hippocrates recommended bathing in spring water. By this time, ancient Egyptians, Romans and Greeks already used public baths as a way of promoting health and wellness. In Egypt, hydrotherapy was often used in combination with aromatherapy. Hydrotherapy lost popularity during the Christian era when nudity was considered immoral and frowned upon in public. Later on during the Renaissance, hydrotherapy was again rediscovered by physicians to treat skin problems and female infertility.

Modern hydrotherapy dates to the 19th century, after Vincent Priessnitz (b. 1799, d. 1851) introduced the results of a successful water cure. He came to be called the “Father of Hydrotherapy” (Metcalf 1898). One of Priessnitz’s followers was Father Sebastian Kneipp (b. 1821, d. 1897), who picked up where Priessnitz left off. Kneipp wrote a book titled *My Water Cure* (originally published as *Wasserkur* in 1894) which described the healing effects of water. The book was so successful that it was later translated into several other languages (Metcalf 1898).

Of importance to notes is that the term “water cure” was also the name of a form of medieval torture in which a person was forced to consume a very large amount of water within a short span of time. This could cause water toxicity and possible death.

2.3.2 Hydrotherapy in women’s health and the delivery setting

Hydrotherapy techniques are often used in various medical fields and in different ways. Gynaecology and obstetrics are no exception. For example, spa-treatments have been very popular in gynaecology in both the past and present days. Balneotherapy is an interdisciplinary natural scientific discipline engaged in origins, collecting, analysing, modification and utilization of natural sources for curative purposes (Škapík 1994).

Even today hot water bottles are still an old favourite for severe menstrual cramps and muscle pain. Hydrotherapy can also be recommended to women suffering from infertility or problems associated with menopause. Hydrotherapy is growing more popular in the areas of pregnancy and labour as well.

2.3.3 Hydrotherapy in pregnancy

The most common use of hydrotherapy in pregnancy is through water exercise and aerobics. In 2011, Brazilian doctors researched if water exercise can improve the quality of life for pregnant women. The study was conducted with a group of pregnant women who were all in different gestational stages. The majority of study participants agreed that water exercises benefited them somehow, although no association between quality of life and water exercise was actually found (Vallim et al. 2011).

Another controlled and randomized clinical trial investigated the effects of water exercise on pregnancy-related lower back pain and pelvic pain. The findings showed that water aerobics decreased sick leave due to pregnancy-related lower back pain or pelvic pain (Granath et al. 2006).

2.3.4 Hydrotherapy during labour

Hydrotherapy during labour is mostly used in the form of baths, showers or compresses during the first stage of labour. Water birth is another option during the final stages of delivery. Immediately after immersion in warm water, a central blood bolus appears. Hydrotherapy during labour is mostly used to reduce pain and anxiety, and to relax pelvic floor muscles and the perineum. An extensive amount of research has been done and is ongoing, since the popularity of hydrotherapy during labour is increasing and its effects are still not fully understood by the medical community. In several researches it has been reported that immersion in warm water reduces the pain of contractions.

A randomized controlled trial regarding water immersion was conducted in Australia to investigate its use in pain management during labour. Two groups were examined. Those who used hydrotherapy and those who received traditional pain management without the use of birthing tubs. Rates of perineal trauma, the length of labour, neonatal outcomes, mode of delivery and psychological outcomes were measured. The use of pharmacological methods was similar in both groups. No statistical differences were observed in length of labour, rates of perineal trauma and mode of delivery. A higher rate of infant resuscitation was observed in women from the bath group compared to women from the

control group. Additionally, the overall satisfaction of labour was higher in women who did not use the birthing tub. The psychological outcomes of both groups were similar. The trial concluded that there were no clear benefits of water immersion or birthing tubs for the labouring women. Yet there were no additional risks with the use of water immersion, with the exception of infant resuscitation rates (Eckert et al. 2001).

Other studies show different findings; two studies observed pain reduction in women who used hydrotherapy. In the Benfield's et al. study (2001) a vertical visual analogue scale was used to measure pain levels in different periods of labour in hydrotherapy and non-hydrotherapy groups. In the earlier study conducted by Cammu et al. (1994), 80% of research participants confirmed the soothing effects of hydrotherapy postpartum. However, the findings are contradictory since both studies described the occurrence of labouring women leaving the bath-tube due to unbearable pain. But because the visual analogue scales were given to participants 24-48 hours after labour, there could be a distortion of results since pain evaluation may not be valid retrospectively (Benfield 2001).

Differences were also seen in the fields of maternal and neonatal outcomes. While Eckert with her colleagues mentioned in their trial a higher need of neonatal resuscitation in the bath group, so the other study found no negative effects of hydrotherapy on infants of mothers who used the baths (Ohlsson et al. 2001). The studies did not find any statistically significant differences in cervical dilation, frequency of contractions, use of painkillers and/or use of oxytocin (Schorn et al. 1993). One study observed lowered use of pitocin (Lenstrup et al. 1987) and another found decreased use of analgesics (Rush et al. 1996).

Epidural analgesia during labour is one of the most favoured pain-management techniques nowadays. According to a study done in 1997, hydrotherapy can significantly reduce use of epidural anaesthesia in primiparas, as well as reduce the operative delivery rates (Aird et al. 1997). A literature review also observed a significant reduction in epidural, spinal and paracervical anaesthesia in women who used hydrotherapy compared to the control group who did not; but there was no observed decrease in the rate of operative deliveries or caesarean sections (Cluet & Burns 2009).

A research conducted in Italy used two groups of women (a hydrotherapy group and a control group) to evaluate the effects of hydrotherapy on the pelvic floor. Six months

after the labour and delivery, vaginal ultrasounds were taken to evaluate urethral mobility and movement of the puborectal sling during contraction of the muscle *levator ani*. No significant differences in the pelvic floor were observed between the groups (Mistrangelo et al. 2007).

2.4 Concluding thoughts

It is difficult for one to draw any reliable conclusions regarding the use of aromatherapy in women's health, particularly in obstetrics and midwifery. The evidence is often contradictory or the findings insufficient to prove the efficacy of essential oils and aromatherapy. In the meantime, it can be noted that the benefits of aromatherapy seem to outweigh the risks, and that the risks posed do not appear to be significant or life-threatening.

Much like aromatherapy, hydrotherapy is not without its sceptics. Many of the studies have been inconclusive or there has been confounding due to factors such as the study design itself, the randomization of (or lack thereof) samples, types of hydrotherapy used (shower, immersion, compress), length of treatment, and even temperature of the water or shape of the bathtub.

3 AIMS OF THE STUDY

The general aim of the study was to explore the perceived effectiveness of aromatherapy and/or hydrotherapy by women in labour.

The specific objective of the study was to describe basic childbirth related characteristics of the participants. The additional goal was to explore perceptions of participants of aromatherapy and/or hydrotherapy and to explore specific reasons why aromatherapy and/or hydrotherapy were used in child labour.

4 SUBJECTS AND METHODS

4.1 Study setting

This cross sectional, descriptive study was carried out in the obstetric ward of the Brno Hospital of Merciful Brothers in the Czech Republic (Nemocnice Milosrdných Bratří, Brno). CAM, especially hydrotherapy and aromatherapy, is regularly used in the course of childbirth. For that reason delivery rooms have been adjusted. There were 1655 childbirths in the hospital of Merciful Brothers in 2012. Out of the total number, caesarean section was performed in 314 cases and epidural analgesia was used in 249 cases (Nemocnice Milosrdných Bratří 2013)

4.2 Study subjects

Several inclusion and exclusion criteria were used for this study. Inclusion and exclusion criteria were based on previous researches by Eckert et al. 2001 and Cluet et al. 2004.

Inclusion criteria were as following:

1. Participants of the study were females who decided to use aromatherapy and/or hydrotherapy method during labour and who completed questionnaires not more than 12 hours after delivery.
2. Women with single pregnancy at term and foetus in cephalic presentation.
3. Women had to be free from medical and obstetric complications.

Exclusion criteria were following:

1. Women who experienced premature birth (37 weeks of pregnancy or less) or over term birth (2 completed weeks of pregnancy after due date)
2. Women with induced labour.
3. Women with BMI of 30kg/m² or higher before pregnancy as well as women who gained 20 kg or more during the pregnancy
4. Women with any major medical or obstetric complication (narrow pelvis, gestational diabetes, endocrinal diseases, hypertension, CVDs etc.)

5. Women with babies of 4000g or higher, due to 62% positive predictive value of shoulder dystocia.

Taking part in the research was voluntary and anonymous.

4.3 Questionnaire and data collection

Seven pages questionnaire consisting of two parts was created. The first part was composed of 11 questions related to medical aspects of labour. This part was completed by a midwife or a doctor in the presence of a respondent.

The second part was composed of 15 questions and it was completed by a respondent. Four questions out of that number were visual analogue scales ranging from zero at the far left of the scale (negative) to 10 at the extreme right (positive). Two questions were associated with motives for using aromatherapy and/or hydrotherapy and also with explanation from where the knowledge about hydrotherapy and aromatherapy was obtained. Five questions were related to respondent's subjective perception of labour of which three questions are added to ask possible confounding factors. Questionnaire development was based on previous researches and literature. (Attachments 1 and 2)

Questionnaire was piloted and modifications were made accordingly.

Printed questionnaires were distributed not more than 12 hours after spontaneous labour to women who used hydrotherapy and/or aromatherapy during their labour. Time limit was determined on the basis of previous Benfield research in 2002. He disputes validity of his research results because of a long time period between birth and completing the questionnaire by a woman. According to him it is complicated to evaluate the pain retrospectively.

Midwives and medical doctors handed over questionnaires to the participants and they were requested to complete one part of the questionnaire with the help of a midwife. The second part was completed by the participants who returned it into non-transparent box placed in the childbed ward. Sampling was accidental.

Data collection took place between September 1, 2013 and October 20, 2013. Forty five questionnaires were distributed and thirty eight questionnaires were returned. Eight questionnaires were not completed properly and were excluded from the study. The total number of evaluated questionnaires was 30.

4.4 Research approval

The permission to collect data was acquired from the hospital administration.

4.5 Statistical analysis

SPSS statistic program (version 21) was used for the data management and statistical analyses. The obtained data were transformed into data matrix. Data coding occurred by unequivocal transcription. All codes are disjunctive and completely exhaust possible values in which a given variable can obtain to preserve maximum information for a variable without any reduction.

Frequencies, percentages, means and standard deviations of the various variables were analysed to describe data.

5 RESULTS

Sample of 30 respondents was statistically analysed.

Basic social-demographic characteristics are presented in tables 3. and 4. The mean age of respondents was 31.2 years. More than half of them were married (53.3%) and more than half of them had university degrees (55.2%).

Table 3: Age

Variable	minimum	maximum	mean	SD	median
Age, y	20	39	31.2	4.6	32

Table 4: Education and marital status

Variable	Frequency	Valid percent (%)
Education		
Vocational school	4	13.8
High school	9	31.0
University	16	55.2
Marital status		
Single	9	30.0
Married	16	53.3
In a relationship	2	6.7
Divorced	2	6.7

The half of the respondents (50.0%) were primiparas. The majority of women gained 11-15kg during pregnancy (43.3%). Parity and weight gained during the pregnancy are presented in table 5.

Table 5: Parity and weight gained during pregnancy

Variable	Frequency	Valid percent (%)
Parity		
Primipara	15	50.0
Secundipara	9	30.0
Multipara ¹	6	20.0
Gained weight		
7-10kg	11	36.7
11-15kg	13	43.3
16-20kg	5	16.7
More than 20kg	1	3.3

¹ Multipara: tercipara (5×), 4.th child (1×)

In half of the respondents the first stage of labour was 5-7 hours (50.0%) and in most respondents the second stage of labour took more than 40 minutes (20.0%). The lengths of the first and second stages of labour are presented in table 6.

Table 6: Length of the first and second stages of labour

Variable	Frequency	Valid percent (%)
Length of the 1st stage of labour		
2-4 hours	11	36.7
5-7 hours	15	50.0
8-12 hours	4	13.3
Length of the 2nd stage of labour		
Less than 5 minutes	2	6.7
5-10 minutes	5	16.7
11-15 minutes	5	16.7
16-20 minutes	5	16.7
21-30 minutes	5	16.7
31-40 minutes	2	6.7
More than 40 minutes	6	20.0

The most common position during labour was the birthing stool (36.7%) and the back labour position (36.7%). Less than half of the respondents used some medication during labour (46.7%) and only one respondent used epidural analgesia (3.3%).

None of the respondents needed continual foetal monitoring and none of the respondents had complications during labour.

Most of the newborns weighted 3000-3490g (55.2%). The therapy most used was hydrotherapy (56.7%) followed by a combination of hydrotherapy and aromatherapy (40.0%). The position, medication, use of epidural analgesia, complications, foetal monitoring and

CAM used during labour and weight of the newborns are presented in table 7.

Table 7: Position, medication, use of epidural analgesia, complications, foetal monitoring, CAM used during labour and weight of the newborn

Variable	Frequency	Valid percent (%)
Position during 2nd stage of labour		
Birthing stool	11	36.7
Back labour position	11	36.7
Hands and knees position	2	6.7
Squatting	1	3.3
Other position ¹	5	16.7
Medication during the labour		
Yes ²	14	46.7
No	16	53.3
Use of epidural analgesia		
Yes	1	3.3
No	29	96.7
Complications during labour		
Yes	0	0.0
No	29	96.7
Continual foetal monitoring		
Yes	0	0.0
No	30	100.0
Weight of new-born		
2500-2900g	3	10.3
3000-3490g	16	55.2
3500-3990g	10	34.5
Type of used CAM ³		
Aromatherapy	1	3.3
Hydrotherapy	17	56.7
Aroma and hydrotherapy	12	40.0

¹ Other position: on the side (2×), sitting on obstetric chair (2×), half sitting position (1×)

² Medications: spasmopan, algifen, oxytocin, analgin, novalgin, natrium chloride, dolsin,

plegomazin, buscopan

³ 7 respondents used homeopathy in combination with one of the mentioned methods

Most of the respondents got information about aromatherapy and/or hydrotherapy in prenatal courses (53.3%) or from the internet (43.3%). The most common reason for hydrotherapy and/or aromatherapy use were a midwife's or a medical doctor's recommendation (83.3%) and knowledge gained by self-study (40.0%). Detailed results of awareness of aromatherapy and hydrotherapy and reasons for their use are presented in table 8.

Table 8: Awareness of aromatherapy and hydrotherapy and reasons for their use

Variable	Frequency	Valid percent (%)
Information about aroma- and/or hydrotherapy ¹		
Prenatal course	16	53.3
Internet	13	43.3
Books specialized in labour	5	16.7
Friend	3	10.0
TV, radio, magazines, newspaper	2	6.7
Gynecologist	2	6.7
Other ²	8	26.7
Reasons for aromatherapy and/or hydrotherapy use ¹		
Midwife's, doctors recommendation	25	83.3
Knowledge gained by self-studying	12	40.0
Previous labour experience	8	26.7
Friend's recommendation	4	13.3
Other reason ³	2	6.7

¹ Respondents were allowed to choose more than one option

² Other: midwife (7×), doula (1×)

³ Other reason: doula's recommendation (2×)

Question “Was there anything that changed your perception of the labour?” was asked to find out whether any aspect affected the perception of childbirth. More than half of the respondents answered that there was nothing that changed their view (feelings) of labour (58.1%). This was an open question with the possibility of free answer and it was asked to understand whether there were some other factors (negative or positive) which could influence the view and feelings of the labour.

Most of the respondents stated that the delivery ward environment positively influenced their labour experience (73.3%). The person most commonly attending the labour of the respondent was a husband or a partner (83.3%). Detailed results of factors which could influence the birthing process are presented in table 9.

Table 9: Factors which could influence birthing process

Variable	Frequency	Valid percent (%)
Was there anything that changed your viewing of the labour ¹		
Nothing	18	58.1
Positive staff's approach	3	9.7
I don't know	3	9.7
New born baby	2	6.4
Labour was wonderful experience	2	6.4
Other ²	3	9.7
Influence of delivery ward environment on labour		
Yes, positive ³	22	73.3
Yes, negatively	0	0.0
No influence	8	26.7
Presence of close person during the labour ⁴		
Husband, partner	25	83.3
Friend	1	3.3
Doula, private midwife	8	26.7
Mother, mother in law	0	0.0
Other ⁵	4	13.3

¹ Question with free answer

² Other: Strengthening of the relationship with partner, natural birth after previous caesarian section, alternative birth position

³ Positive: Pleasant home environment, peace and semi-darkness (11x), possibility of alternative methods (8x), modern equipment, staff's approach (6x), possibility of labour in presence of partner (4x)

⁴ Some respondents answered with more than one answer

⁵ Other: Sister (1x), nobody (3x)

Hydrotherapy and/or aromatherapy were mostly positively evaluated in pain management (86.7%). Positive effects were described as pain relief, better pain tolerance, general relaxation and soothing qualities.

Higher expectations and aromatherapy, which was not a good reliever, were reasons why the role of hydrotherapy and/or aromatherapy in pain management was evaluated neither positively nor negatively.

The biggest influence of aromatherapy and/or hydrotherapy on labour was pain relief (40.0%) and a relaxation-like effect (30.0%). A pleasant influence (15.0%) and improved atmosphere, nice scent (10.0%) were also mentioned as influences of aromatherapy and/or hydrotherapy. Detailed results of evaluation of aromatherapy and hydrotherapy are presented in table 10.

Table 10: Evaluation of aromatherapy and hydrotherapy

Variable	Frequency	Valid percent (%)
Evaluation of aromatherapy and/or hydrotherapy in pain management		
Positive ¹	26	86.7
Neither positive nor negative ²	4	13.3
Negative	0	0.0
Influence of aromatherapy and/or hydrotherapy on labour ³		
Pain relief	16	40.0
Relaxation-like effect	12	30.0
It was pleasant	6	15.0
Improved atmosphere, nice scent	4	10.0
Precipitation of labour	2	5.0

¹ Positive: pain relief, better pain tolerance (19x), general relaxation and soothing (7x).

² Neither positive nor negative: higher expectations (2x), aromatherapy was not as good as reliever (1x).

³ Question with free answer.

The painfulness of contractions during the 1st stage of labour including total painfulness was evaluated on visual analogue scales. The mean value for pain perception of contractions during the 1st stage of labour was 6.13 and the mean of total painfulness of 1st stage of labour was 5.80. Results are presented in table 11.

Table 11: Pain evaluation during the first stage of labour (visual analogue scales)

Variable	Mean	S.D
Painfulness of contractions during the 1st stage of labour	6.13	4.56
Painfulness of whole 1st stage of labour process	5.80	1.69

Visual analogue scales were used also to evaluate overall experience of childbirth (mean 8.53), to evaluate if labour was met with expectations (mean 8.57) and satisfaction with hospital staff approach (mean 9.50). Detailed results of satisfaction with labour are presented in table 12.

Table 12: Satisfaction with labour (visual analogue scales)

Variable	Mean	S.D
Overall experience of childbirth	8.53	1.41
Labour meet expectations	8.57	1.25
Satisfaction with hospital staff approach	9.50	0.57

6 DISCUSSION

This study was carried out as a descriptive cross-sectional study. It was a unique study in the Czech Republic, where CAM methods are used in many delivery wards in hospitals but the scientific research is missing as well as official statistics about the use of CAM in delivery wards. Institute of Health Information and Statistics of the Czech Republic, which is part of the National Statistic Service, is also responsible for national register of women in labour. However, this register does not include using of the CAM. For this reason, it is not possible to compare the results with another studies conducted in the Czech Republic.

Finding of this study are consistent with some previous studies from other parts of the world, pointing out that aromatherapy and/or hydrotherapy can have positive influence on labour process. For example in a similar research dealing with the use of aromatherapy during intrapartum carried out by Burns and colleagues (2000) in the United Kingdom the aromatherapy was rated helpful by 50% of mothers. Result of study conducted in the UK is similar to this study, where 86.7% mothers evaluated aromatherapy and/or hydrotherapy positively.

However, the Burns study had much more participants and dealt only with aromatherapy. Another study, conducted in Germany, showed that the aromatherapy was also positively evaluated as a pain, stress, and anxiety relief during the labour (Münsted et al. 2009).

Another study concluded, that subjective maternal responses to bathing in labour was favourable (Benfield 2002). It is similar to the results of this study, with the exception that this study explored effect of hydrotherapy and aromatherapy together and not separately as Benfield.

However, there are also studies showing that there are no unequivocal benefits for the labouring woman using hydrotherapy (Eckert et al. 2001). Due to the fact that this research was carried out in Australia, it is possible that cultural differences and attitude towards obstetrics played its own role in this study.

Also, reasons why women decided to use alternative therapies are similar to previous studies. Allaire (2001) found out that most common reasons for the use of alternative medicines were positive experiences from previous pregnancy and medical doctor's or midwife's recommendations. These conclusions are similar to the findings of this study, where medical doctor's or midwife's recommendation were the most common reasons for the use of aromatherapy and/or hydrotherapy. The only difference is that that Allaire explored reasons for using of all CAM unlike this study, which deals only with aromatherapy and/or hydrotherapy.

Analysed data showed that none of respondents perceived the effects of aromatherapy and/or hydrotherapy in a negative way. For this reason, it was not possible to compare results with a group of women having a negative effect towards aromatherapy and/or hydrotherapy.

As it was mentioned earlier, participants of the research had to complete questionnaires twelve hours after the labour. Even though it was a very short time after labour, it was a retrospective evaluation which might change attitude towards CAM effectiveness. So far in no studies the questionnaires were not completed in such a short time after delivery.

Limitation of the above result is due to the fact, that some women were given medications, which were not distributed into subgroups according to the indications. There was only one group established in which analgesics, spasmolytics and also medications strengthening uterine activity were administered. Spasmolytics and analgesics could have influenced perception of pain during the labour, which might have influenced perceived effectiveness of aromatherapy and/or hydrotherapy.

This study has also shown importance of prenatal courses. Prenatal courses were the place, where mothers obtained most information about aromatherapy and/or hydrotherapy. In each country, the concept and content of prenatal courses are very different. For this reason it is not possible to compare the results of this study with other international studies. It is the first research that addresses these issues in the Czech Republic and that is the reason why a comparison with other studies in the Czech Republic is not possible.

6.1 Limitations and strengths of the study

The study faced some limitations. Respondents from one hospital in the Czech Republic were taken into account and their answers analysed. For this reason, the results may not be representative for other hospitals in the Czech Republic. Furthermore, the study sample was small. Only 30 questionnaires were collected out of the total 45 handed over questionnaires. Also, the length of the study was short. Sampling was accidental, which means that generalization for broader population cannot be done.

Women who did not use aromatherapy and/or aromatherapy were not studied, which means there was no control group. Therefore, it could not be studied why aromatherapy and/or hydrotherapy were not selected and the possible differences in labour and pain perceptions between those who used CAM and who did not use it.

Results of the subjective perceptions of aromatherapy and hydrotherapy effectiveness could be confounded by many different factors. For example, how many times the hydrotherapy was used during the first stage of labour or which method of the hydrotherapy was implemented. Other confounding factors could be related to the fact that aromatherapy and hydrotherapy were used together which might result into different outcomes. Also, the length of the used therapies could have an impact on the final result.

Strength of the study lies in the fact that it is a unique study in the Czech Republic. Although CAM is commonly used in many maternity hospitals, research has not been introduced. In addition to that, the strength also lies in the fact that the mothers completed the questionnaire within 12 hours of birth. Even though the CAM ratings, childbirth and pain are assessed retrospectively, it is evaluated in a relatively short period of time after birth, compared with other studies. The contribution of the study rests in supporting further and detailed research which can be performed in more (maternity) hospitals.

7 CONCLUSION

Results of this study showed that commonly used methods of aromatherapy and/or hydrotherapy were met with contentment. It also revealed that women's perception of hydrotherapy and aromatherapy is positive especially in the role of pain management and relaxation. In addition to that, it pointed out that the main reason for using aromatherapy and/or hydrotherapy was a recommendation by a midwife or a doctor.

These findings should promote more interest in this field and lead to further and detailed research.

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ATTACHMENTS

Attachment 1: Questionnaire in English language

Dear respondent,

First of all, congratulations on your newborn baby!

My name is Blanka Tiainen. I am a midwife currently studying a master program in Public Health at the University of Eastern Finland. As part of my studies, I am doing research to see what women think about using aromatherapy and hydrotherapy during the process of child delivery.

The survey is carried out through printed questionnaires, which have two parts. The first part (details about your labour) is supposed to be completed by a midwife or medical doctor in your presence.

The second part contains questions about your experiences with labour and your satisfaction using hydrotherapy and/or aromatherapy methods. This second part is supposed to be completed by yourself.

Both parts of the questionnaire are anonymous and participation in this research is voluntary. You have the right to leave the research by not completing the questionnaire if you do not feel comfortable with the questions.

I am kindly asking you for your cooperation. Questionnaires will be carried out carefully and results of this research will be used only for academic purposes.

Please return the completed questionnaire to the non-transparent box in the childbed ward.

Thank you

Bc. Blanka Tiainen

Questionnaire

I. To be filled by midwife or medical doctor:

1. Parity:
 - a) Primipara
 - b) Secundipara
 - c) Multipara, please specify:

2. Weight gained during the pregnancy since the first medical doctor's visit?
 - a) 0- 6kg
 - b) 7- 10 kg
 - c) 11- 15kg
 - d) 16 – 20kg
 - e) More than 20 kg

3. Type of CAM used:
 - a) Hydrotherapy
 - b) Aromatherapy
 - c) Hydrotherapy and aromatherapy
 - d) Others, please specify:

4. Length of the first stage of labour (in hours) :
 - a) 2 to 4 hours
 - b) 5 to 7 hours
 - c) 8 to 12 hours
 - d) More than 12 hours, please specify:

5. Length of the second stage of labour (in minutes):
- a) Less than 5 minutes
 - b) 5 to 10 minutes
 - c) 11 to 15 minutes
 - d) 16 to 20 minutes
 - e) 21 to 30 minutes
 - f) 31 to 40 minutes
 - g) Other length, please specify:
6. Position during the birth (during the 2nd stage) :
- a) Back labour position
 - b) Hands and knees position
 - c) Birthing stool
 - d) Squatting
 - e) Standing supported squat
 - f) Other position, please specify:
7. Did participant get any medication during the labour?
- a) Yes
Please specify:
 - b) No
8. Was Epidural analgesia used during the participant's labour?
- a) yes
 - b) no
9. Were there complications present during the labour?
- a) Yes
Please, specify:
 - b) No

Attachment 1 (4/9)

10. Was continuous foetal monitoring necessary during the labour?

- a) Yes
- b) No

11. Weight of the new-born:

- a) 2500 - 2990 grams
- b) 3000 – 3490 grams
- c) 3500 – 3990 grams

II. To be filled by patient:

12. Your age:

13. Your education:

- a. elementary education
- b. secondary education with vocational certificate
- c. secondary education with A level exam
- d. university education

14. Marital status:

- b. single
- c. married
- d. in stable relationship
- e. divorced
- f. widowed

15. Where did you get most information about aromatherapy and/or hydrotherapy? Please check out **all suitable** answers.

- a) prenatal course
- b) friends
- c) your gynaecologist
- d) books specialized in pregnancy and labour
- e) internet
- f) TV, radio, newspapers and magazines
- g) other, where? :

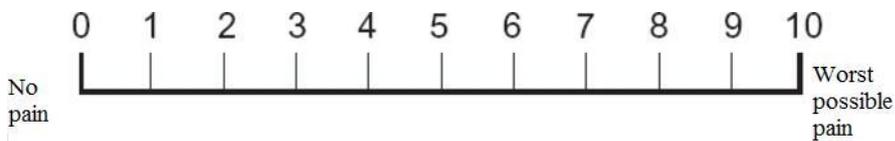
Attachment 1 (6/9)

16. Why did you decide to use hydrotherapy and/or aromatherapy during your labour?

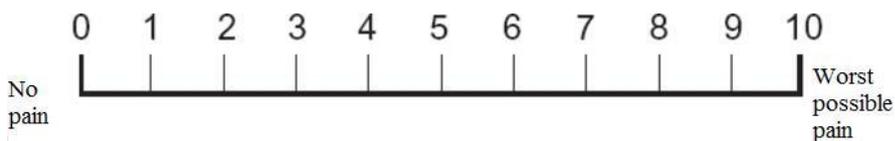
(Please select **all suitable** answers)

- a) Positive experience with hydrotherapy and/or aromatherapy in previous pregnancy
- b) Due to midwife's / medical doctor's recommendation
- c) Due to previous knowledge gained during the pregnancy by self – studying
- d) Due to friend's recommendation
- e) Other reason, please say which one:

17. How painful were your contractions during the first stage of labour? Please **circle the number above** that describes your subjective feelings.

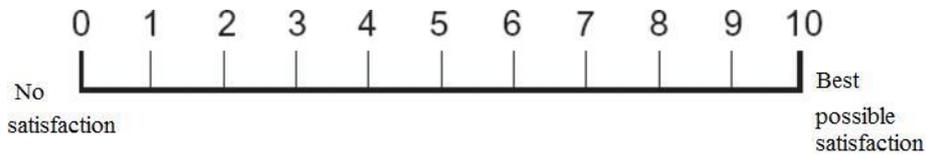


18. How painful was whole first stage of labour process for you? Please **circle the number above** that describes your subjective feelings.

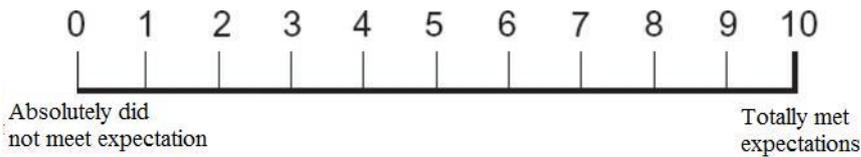


Attachment 1 (7/9)

19. How was your overall experience of childbirth? Please **circle the number above** that describes your subjective feelings.



20. Did the labour met your expectations? Please **circle the number above** that describes your subjective feelings.



21. How did you perceive influence of aromatherapy and/or hydrotherapy on your labour?
Please answer freely.

22. Was there anything specific, that changed your perception of labour? Please answer freely.

23. How would you evaluate effect of aromatherapy and/or hydrotherapy as a pain management? Please check out **only one** answer.

a) Positively

Please specify why?

b) Negatively

Please specify why?

c) Nor positively nor negatively

Please specify why?

24. Did the delivery ward environment (i.e. overall atmosphere, labour room equipment) influence somehow your feelings during the labour? Please check out **only one** answer.

a) Yes, in a positive way

Please specify why?

b) Yes, in a negative way

Please specify why?

c) No it did not influence my feelings anyhow

25. Who was present to your labour? (except medical stuff and midwives), please check out **all suitable** answers.

a) Husband, partner

b) Friend

c) Doula, private midwife

d) Mother, mother in law

e) Other, specify.....

26. Have you been satisfied with hospital staff approach? Please **circle the number above** that describes your satisfaction.

