Cardiff Metropolitan University
Prifysgol Fetropolitan Caerdydd

B.Sc. (Hons) Complementary Healthcare

The effect of Aromatherapy Massage on pain levels in females suffering from Dysmenorrhea

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Dissertation submitted in partial fulfilment of the requirements of the Cardiff Metropolitan University for the degree of Bachelor of Science
**Declaration**

I hereby declare that this dissertation is the result of my own independent investigation under the supervision of my tutor. The various sources to which I am indebted are clearly indicated. This dissertation has not been accepted in substance for any other degree and is not being submitted concurrently for any other degree.

Candidates signature: __________________________
Acknowledgements

I would like to thank all the degree programme tutors for all their support over the last three years, and for making this degree interesting and worthwhile.

I would also like to thank my family and friends for their support.

Finally thank you to my participants for taking part in the study.
Abstract

Background:
Previous studies reported a prevalence of dysmenorrhea in women age 18-25 of 84%. There are few published examples examining the effect of self-applied aromatherapy massage with clary sage and sweet marjoram essential oils on pain levels in participants suffering from dysmenorrhea.

Research Question:
What is the effect of self-applied aromatherapy massage on pain intensity and quality of pain in females suffering from dysmenorrhea who manage their condition without medication?

Methods:
An experimental study with 4 participants primarily using quantitative data supported by qualitative. Participants applied oil with essential oil on their abdomen at baseline (period 1) and intervention (period 2). The short form of the McGill Pain questionnaire (SF-MPQ) including the Visual Analogue Scale (VAS) and the Present Pain Index (PPI) were used to investigate the quality and intensity of pain in participants at baseline and before/after intervention. A short questionnaire at follow up was used to gather further qualitative data.

Results:
There was a general trend amongst the group in pain intensity findings towards a reduction in pain. General the pain showed a slight decline in heaviness, aching, sharpness and sickening character in the SF-MPQ scores. None of the participants experienced adverse effects from using the oil.

Conclusion:
This was a limited study, but findings suggest that the intervention could reduce period pain. However due to sample size and methodological limitations no conclusions about efficacy of aromatherapy massage can be made. Further research with a larger sample size and a control group is necessary to confirm findings of this study and eliminate bias.
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1.0 Literature review

1.1. Introduction

Primary dysmenorrhea is the occurrence of painful menses usually beginning within several years of menarche and in the absence of any pelvic pathology, but may occur at any time during childbearing years. Pain occurs from the first day of menstruation and lasts up to 72 hours improving towards the end of menstruation (NICE, 2018). Primary dysmenorrhea can be caused by prostaglandins which are produced in the uterine lining and transmitted into the bloodstream as the lining is shed. This process can cause smooth muscle contraction, nausea and/or diarrhoea. Symptoms of primary dysmenorrhea can include regular, recurrent pain that can occur monthly prior to menses or with menses. Other symptoms patients might present with are; pelvic pain, back pain, nausea, diarrhoea/constipation, weakness, dizziness, weight gain, breast tenderness. (NICE, 2018; Hawkins et al, 2016; Rosenfeld, 2001).

Dysmenorrhea is very common but it’s difficult to find precise numbers as it often goes unreported. Ju et al (2013) found in their review of 15 primary studies that the prevalence of dysmenorrhea varied between 16-91% of the women studied. One reason for the large difference in results could be large differences in inclusion criteria such as pain severity, age, and type of dysmenorrhea. In a cross-sectional study of 310 girls age 18-25, prevalence of dysmenorrhea was reported in 84.2 % of participants (Joshi et al, 2015). Another cross-sectional analytical study with 408 participants looking at prevalence of dysmenorrhea found that menstrual pain was reported by 84.1 % of participants (Grandi et al, 2012).

Primary dysmenorrhea is the most common reason for absence from school in adolescent girls with 15% reporting severe dysmenorrhea. Risk factors associated with dysmenorrhea are longer duration of menses, early menarche, smoking, alcohol and obesity. Depression and a lack of social support can increase pain (NICE, 2018). Family history has been found to increase the risk of dysmenorrhea (Joshi et al., 2015; Ju et al, 2013). A comprehensive review by Ju et al (2014) analysing 15 primary studies on prevalence and risk factors for dysmenorrhea found that stress is
positively associated with dysmenorrhea. However, Dehkordi et al (2017) suggests that stress might affect regularity of dysmenorrhea but not dysmenorrhea itself. Dysmenorrhea improves with increased age, parity and use of oral contraceptives (Ju et al, 2014). Weissmann et al (2004) suggests that women aged <25 were more than twice the risk of reporting moderate to severe pain than women aged 25-34.

Traditionally dysmenorrhea is treated with nonsteroidal anti-inflammatory drugs (NSAIDs) (Hawkins et al, 2016; Marjoribanks et al, 2015; Chavez et al., 2003). Evidence suggests that cramping abdominal pain in dysmenorrhea is caused by high levels of prostaglandins hormones. NSAIDs block prostaglandin production by inhibiting the action of cyclooxygenase (COX), an enzyme responsible for the production of prostaglandins (Marjoribanks et al, 2015). Hawkins (2016) suggests the following drugs for treating dysmenorrhea: ibuprofen, mefenamic acid, naproxen, Naprosyn, anaprox, flurbiprofen, meclofenamate. Evidence suggests side effects of NSAIDs can include gastric mucosal damage, renal toxicity and impairment of female fertility (NICE, 2018).

Marjoribanks et al (2015) conducted a systematic review to compare the effectiveness of NSAIDs with placebo and to investigate the prevalence of adverse effects in treating dysmenorrhea. The results suggest that NSAIDs are effective for pain relief. The findings suggest that 10% of women taking placebo experience side effects, such as indigestion, headaches and drowsiness, compared to 11-14% of women taking NSAIDs will do so. However, these results could be biased as most studies included in the review were commercially funded (59%) or the funding sources were not clear (31%). The authors rated the quality of evidence as low due to the poor reported study methods. Further independent research is needed into prevalence of side effects of NSAIDs.

In comparison to the side effects of medication such as NSAIDs, studies that looked at the effect of massage, applied by a researcher, on dysmenorrhea reported no side effects (Bakhtshirin et al, 2015; Apay et al, 2012; Han et al, 2006). In an earlier study by Kim et al (2011) looking at self-aromatherapy massage and dysmenorrhea, one of 63 participants experienced nausea. However, the authors were not sure whether the nausea was a side effect of treatment or a symptom of dysmenorrhea.
NICE (2018) reports anecdotal evidence of women finding symptom relief through lying in the supine position and abdominal and/or back massage. Massage can activate the mechanoreceptor pathway to the brain which inhibits the pain pathway. The sensations that arise from touch to the skin, such as in massage, arrive at the brain before pain sensations and can help to displace the awareness of pain (Fox, 2014; Fox and Pritchard, 2003). Previous studies have found massage to be beneficial in reducing pain in participants suffering from dysmenorrhea (Apay et al., 2012; Bakthshirin et al., 2015; Han et al., 2006). Further massage was found to be more effective in reducing pain than isometric exercises (Azima et al., 2015).

It is known that both massage and aromatherapy are beneficial. However, when combined, they can bring a greater health outcome to the patient. Several studies have shown that massage using essential oils is more effective in reducing pain in participants suffering from dysmenorrhea than solely massage (Sut et al, 2017; Bakthshirin et al, 2015; Apay et al, 2012; Kim et al, 2011; Han et al 2006). Recent studies found that lavender massage had a beneficial effect in reducing dysmenorrhea in participants (Azima et al, 2015; Bakthshirin et al, 2015; Apay et al, 2012).

A randomized placebo controlled trial by Han et al (2006) used a combination of essential oils such as clary sage (Salvia sclarea), lavender (Lavandula officinalis) and rose (Rosa centifolia) and found the oils, applied in aromatherapy massage by a therapist, effective in reducing menstrual pain in participants. A systematic review by Ali et al (2015) recommends sweet marjoram (Origanum majorana) for pain management and mentions the antispasmodic effects of clary sage. However, the therapeutic effects of clary sage and sweet marjoram are not well supported by recent clinical studies.
Kim *et al* (2011) conducted a placebo controlled trial on the effect of self-aromatherapy massage on pain and anxiety in 63 nurses. Participants were divided into three groups. An experimental group, placebo group and no-treatment control group. The experimental group carried out self-massage using a blend of different essential oils including clary sage (*Salvia sclarea*) diluted in carrier oil at a 3% concentration. Participants learned the self-massage techniques before the start of the study. Visual Analogue Scale (VAS) was taken for pain and anxiety. Results were analysed using SPSS. According to Kim *et al* (2011) up to date of the study, this was the first study to focus on self-administered aromatherapy massage. According to Kim *et al* (2011) results were consistent with previous studies, where massage was applied by a researcher.

Earlier sources point out the spasmolytic effects of clary sage and sweet marjoram due to their high esters content (Battaglia, 2003; Schnaubelt, 1995). Price (2000) suggest the use of clary sage and sweet marjoram for painful periods. Tisserand (1985) suggests a blend of clary sage in vegetable oil applied to the abdomen could relieve period pain. In aromatherapy massage essential oils are applied dermally and diluted in carrier oil at a safe dilution of 4% (Price and Price, 2012; Balacs and Tisserand, 1995).

In dermal administration essential oils diffuse through the skin; stratum corneum, epidermis, until the oils reach the upper dermis and enter capillary circulation (Balacs and Tisserand, 1995). Evidence suggests that massage enhances the absorption of some essential oils (Brown, 1943). Battaglia (2003) suggests applying the oil in a massage or hot press on the abdomen to improve blood flow and increase the rate of systemic absorption. Clary sage and sweet marjoram have been reported to be non-toxic, non-irritant and non-sensitising (Battaglia, 2003; Balacs and Tisserand, 1995).
1.2. Literature review

A thorough electronic and manual search was carried out to find literature in the English language, released in the last 5 years with importance to this study (2013-2018). However, if no recent literature could be found older relevant article were obtained and utilised. Electronic databases searched included; Met Search, Science Direct, Google Scholar, Cochrane Library, Elsevier. The manual search concentrated on books and journals related to the subject. Searches included the following keywords: ‘aromatherapy’, ‘massage’, ‘dysmenorrhea’, ‘clary sage’, ‘sweet marjoram’, ‘pain’, ‘complementary therapies’. The three following studies were reviewed in detail:

- Effect of Aromatherapy massage on Dysmenorrhea in Turkish students’, quasi-experimental design (Apay et al, 2012);

- The effect of aromatherapy massage with lavender oil on severity of primary dysmenorrhea in Arsanjan students (Bakhtshirin et al, 2015);

- A Randomized Controlled Trial on a comparison of the effect of massage therapy and isometric exercise on primary dysmenorrhea (Azima et al, 2015).

Apay et al (2012) looked at the effect of aromatherapy massage on dysmenorrhea in Turkish students. Forty-four midwifery and nursing students volunteered to take part in this study. A quasi-experimental design with subjects as their own control was included. Inclusion criteria used are a regular menstrual cycle and a VAS score over 60 for menstrual pain. Participants with systemic diseases or the use of analgesics were excluded. The monitoring of participants was conducted over three menstrual cycles. Mean VAS pain rating of participants was 80 plus 10 before intervention, average age of participants was 20 years, average period length: 7 days.
Every participant experienced both interventions. Intervention 1; aromatherapy massage (with lavender oil), Intervention 2; placebo massage (with odourless liquid). Participants were randomly allocated to the two treatments. Participants were asked to rate menstrual pain on a VAS 1-100 on the first day of their period in the first menstrual cycle. At the second period, a 15-minute aromatherapy massage with 2ml lavender oil was given to the first group while the second group received a placebo massage with odorless liquid by a researcher at a fixed time. At the 3rd period, group 1 received the placebo massage and group 2 received aromatherapy massage. Participants were asked to rate their pain on the VAS after the 1st and 2nd intervention. In the end 3 VAS scores per participant were obtained.

The VAS evaluation was conducted by a researcher who did not know the study group to keep the study unbiased. Data was analyzed with SPSS. There was a significant difference in menstrual pain VAS scores between pre- and post-application in both the placebo massage and aromatherapy massage (p<0.001). The results of the aromatherapy massage compared with the placebo massage were lower (p<0.001). The results of the study demonstrated that self-applied massage was effective in reducing dysmenorrhea. Further the effect of self-applied aromatherapy massage was greater than the effect of solely self-applied massage.

One strength of this study is that it took place over three menstrual cycles. The study accounted for placebo as it offered a massage with odorless liquid. However, it can be argued that participants could still be biased due the lack of smell during placebo massage. It is unclear if the lavender oil was applied diluted and on what day of the period the intervention took place. The VAS evaluation was conducted by a blinded researcher to reduce bias which makes the study more robust. This study is limited by a small group of participants. A larger sample size would have increased credibility of this study.
As participants were nursing and midwifery students that voluntarily signed up for the study they might have been biased towards or against the therapy. Recruiting participants from a broader social background would have increased diversity in this study. This study does not consider the long-term impact of the intervention. The study would have been more persuasive if the author would have included follow up measurements after cycle 3.

This study suggests that self-applied aromatherapy massage on the abdomen with lavender essential oil is beneficial in reducing pain levels in women in their twenties suffering from dysmenorrhea. This study doesn't show effectiveness of the use of clary sage (Salvia sclarea) and sweet marjoram (Origanum marjorana). The results of this study suggest that aromatherapy and massage used together is more beneficial than solely massage.

Bakhtshirin et al (2015) looked at the effect of aromatherapy massage with lavender oil on severity of dysmenorrhea in Arsanjan nursery and midwifery students. Initially 200 nursing and midwifery students between the age of 18-24, living in the Islamic Azad University dormitory in Iran, were recruited. Visual analogue scale (VAS) was used to measure the level of menstrual pain before intervention. Participants who rated their menstrual pain higher than 6 on a VAS on their first day of menstruation were included. A clinical trial method was used on 80 eligible students. The intervention took place over three periods.

During the first cycle of menstruation the severity of pain was measured without an intervention on a 0-10 VAS. For the second period participants were randomly divided into 2 groups. Group 1 received aromatherapy massage with lavender oil and group 2 received a placebo massage with placebo oil. The lavender oil contained 2 drops of lavender in 5ml sweet almond oil, a dilution of 2%. In the third menstrual cycle Group 1 received a placebo massage and Group 2 received a lavender massage. Both groups served as their own control. In the second and third cycle menstrual pain was rated on a 0-10 VAS 30 min before and after intervention. 5 VAS scores for each participant were collected in total.
Data was analysed using the SPSS Software. A statistically significant difference was found in VAS scores before/after placebo massage \((t = 8.31, P < 0.001)\). Further VAS before/after score of lavender massage on severity of pain in dysmenorrhea was higher than that of placebo massage \((t = 14.88, P < 0.001)\). Findings of this study suggest that massage is effective in reducing pain in dysmenorrhea. Further lavender massage has a greater effect on pain reduction than placebo massage.

Compared to the study of Apay et al (2012) this study has a larger participant group of 80 participants rather than 40. This produces a more robust study with more reliable results as they represent a larger population group. Further research with a larger study group could bring greater results. One strength of this study is a similar age range and menarche age improve depth of the study.

Bakhtshirin et al (2015) states the reason for choosing this participant group is the relative similarity of subjects concerning residency, diet, physical activity, knowledge of anatomy, physiology, pharmacology, greater sensitivity to health issues and their cooperation in scientific papers. This is a strength of the study as it provides a deeper insight into a specific demographic group (18-24). On the other hand, it could cause bias as participants could be biased towards or against complementary healthcare as they were studying nursing and midwifery.

Participants might recognize the intervention group by the smell of lavender and could therefore be biased towards giving lower VAS scores after receiving aromatherapy massage. In future research this could be avoided through using an oil with artificial fragrance in the placebo group. Since participants were all students recruited from the same university the study sample is very specific and can’t be generalised to a wider population. More research including women with different educational, social and ethical background is needed to increase diversity.
Another drawback of this study is that participants were massaged by fellow students and staff rather than by a professional therapist. Five students were used as research assistants and trained in massage. Their performance was observed and the reliability of the massage was confirmed. However, it could be argued that if the massage would have been carried out by a professional massage therapist with more experience, the outcome might have been different. This study suggests that massage of the abdomen is effective in reducing severity of primary dysmenorrhea in female students aged 18-24. The study further suggests that aromatherapy massage on the abdomen with lavender essential oil is beneficial in reducing pain levels. This study shows that aromatherapy and massage used together is more beneficial than solely massage. Compared to Apay et al (2012) this study is more convincing as it has a larger study group.

Azima et al (2015) compared the effect of massage therapy and isometric exercises on primary dysmenorrhea. A randomized control trial of 102 students who were studying in non-medical fields with primary dysmenorrhea was conducted. Participants were recruited from the dormitories of Shiraz University. The study lasted for 8 months from October 1, 2012 to May 31, 2013. The study was not blinded.

Participants were included if their dysmenorrhea had been diagnosed based on the demographic questionnaire and a gynaecologist’s confirmation. Participants who rated menstrual pain 5 or higher on a VAS were included. Other inclusion criteria were lack of routine use of any pharmacologic or nonpharmacologic analgesic agents, being nulliparous, not taking oral contraceptive pills, not having a systemic or a reproductive system disease, and not having limitation for performing isometric exercises, such as a cardiovascular disease. The following exclusion criteria were applied; not being willing to cooperate in the study, using other treatments during the study, being allergic to lavender oil, taking any medications, having any disease, and having any physical or psychiatric problem.
Participants were randomly allocated into 3 groups; group 1 = massage group, group 2 = isometric exercises, group 3 = control group. Participants in the massage group contacted the researcher at the peak of pain usually on the first day of their period. Participants received the following intervention: Participants were asked to lie down in a supine position and some lavender oil was applied on the abdomen. This included effleurage massaging of the upper part of symphysis pubis and umbilicus was started in a clockwise manner (each for 15 minutes). Effleurage massage, which is performed with gentle and rotary strokes, is a simple, soothing, and light massage that is more easily tolerated by the patients experiencing pain. Participants received the same massage again on the second day of the cycle. Azima et al (2015) describes the massage oil as “lavender extract based on olive oil with 10 % purity “ (p2).

The participants of the second group were required to perform the isometric exercises since the third day of the menstrual cycle 5 days a week, two sessions a day, and 10 times per session for 8 weeks. These exercises included 7 stages, which were modified and confirmed by a specialized rehabilitation consultant. Participants in the control group received no intervention. Pain intensity, duration of pain, and anxiety level were measured at the end of weeks 4 and 8 after the cycle. The intensity and duration of pain and anxiety level were measured for the three groups in three consecutive cycles. Outcome measures used were VAS for pain intensity and Spielbergers questionnaire to measure anxiety. Duration of pain was measured in hours. Data was analysed using SPSS.

There was a significant reduction in pain intensity in the massage and exercise group. There was a greater reduction in pain intensity in the massage group compared with the exercise group (p<0.001). However no significant difference was found among the 3 groups regarding the mean anxiety level. An intragroup comparison indicated a significant reduction of anxiety level in the massage group after the third cycle. The study suggests that massage therapy and isometric exercises were effective in reducing pain intensity in women suffering from dysmenorrhea. Massage was more effective than the isometric exercises in reducing pain intensity.
As participants were undergraduate students in non-medical fields this controls for bias towards the intervention. Inclusion criteria are specified and based on the gynaecologist’s confirmation and a rating > 5 on the VAS. Azima et al. (2015) gives sufficient consideration to safety of aromatherapy as participants were tested for skin sensitivity to lavender oil. However, the description of the massage oil lacks clarity. It isn’t mentioned how much massage oil was applied during the intervention. The paper improves the quality of the study by analysing data through a standardized method; SPSS. The use of a RCT incorporated direct comparison of participants receiving an intervention and those not to determine the effectiveness of the intervention. The author notes difficulties in using the Spielberger’s questionnaire as only a small number of participants answered the large number of questions.

The study fails to account for placebo. The quality of the study could have been improved through providing a placebo intervention for aromatherapy massage such as massage without oil. Further research is necessary to investigate a possible placebo group for exercise. The study shows that massage could be effective in reducing pain in participants suffering from dysmenorrhea. This study suggests that massage is more effective than isometric exercise in reducing pain in participants suffering from dysmenorrhea.
1.3. Conclusion

The literature reviewed suggests that aromatherapy massage is more effective in reducing pain levels in participants suffering from dysmenorrhea than solely massage. Aromatherapy massage was found to have no side effects such as nausea, indigestion, headaches on participants. The prevalence of participants experiencing side effects from traditional painkillers such as NSAIDs remains unclear. The literature reviewed suggests using VAS to measure pain levels. To further gain data on the quality of pain it was decided to use the short form of the McGill Pain Questionnaire (SF-MPQ) as a suitable outcome measure.

The review points out that the best time frame for an intervention is 3 menstrual cycles. However due to time constraints of an undergraduate project a time frame of 2 menstrual cycles was agreed on. The period 1 in cycle 1 will be used as baseline and intervention will take place at period 2 in cycle 2. SF-MPQ will be filled out by participants at baseline and before/after period 2. After the intervention participants will be send a short questionnaire to gather further qualitative data.

In most of studies reviewed massage was applied by a researcher to provide homogeneity of treatment. However due to unpredictability of individual menstrual cycles and time constraints of an undergraduate project in this study it was decided to use self-applied aromatherapy massage as the intervention. Studies reviewed used dilutions of up to 3% in the aromatherapy massage blend. In this study a dilution of 4% will be used to increase absorption of essential oils into the blood stream.

As menstrual pain is experienced as localised pain in the abdominal area the massage oil will be applied topically via dermal administration to the abdomen. Reviewed studies used different essential oils predominantly lavender. However, after reviewing less recent aromatherapy books, it was decided to use clary sage (Salvia sclarea) and sweet marjoram (Origanum majorana) due to their antispasmodic and analgesic properties. Grapes seed oil (Vitis vinifera) was used as a base oil as it is reported to be non-toxic and hypoallergenic leaving the skin with a smooth finish without being to greasy (Price et al, 2004).
1.4. Aim of research
With this review in mind the aim of this study is to investigate the effect of self-applied aromatherapy massage to the abdomen on pain intensity and quality of pain in females suffering from dysmenorrhea, who manage their condition without medication.

2.0. Method
2.1. Introduction
This is an experimental study including 4 participants investigating the effects of aromatherapy massage on pain intensity and quality of pain in females suffering from dysmenorrhea who manage their condition without medication. This study applied mixed methods. Quantitative methods were supported by qualitative methods. Time and resource constraints of an undergraduate project applied to this study.
2.2. Design
A Single Subject Experimental Design (SSED) was used. A pre-test post-test approach was used;

**Initial Interview:** An interview was conducted with participants at the University. Participants were asked to fill out a consent form (Appendix 6). Participants were asked to answer all questions of the consultation form (Appendix 9). Participants were informed about the study and given a 50-ml bottle with massage oil.

**Baseline phase (A1):** Participants were asked to fill out the VAS and Short Form McGill Pain questionnaire at on the first day of period one to measure pain intensity and quality of pain.

**Intervention Phase (B):** Participant were asked to fill out the VAS and Short Form McGill pain questionnaire before and 10 min after intervention at the first day of period two.

**Follow-Up Phase (A2):** Participants were asked to fill out a questionnaire as a follow up after intervention one to gather supportive qualitative data (Appendix 2).

Data taken at baseline was compared to the end of the study, and data collected before and after treatments.
## TABLE 1: RESEARCH STUDY SCHEDULE

<table>
<thead>
<tr>
<th>Session</th>
<th>Activity</th>
<th>Phase</th>
<th>Cycle</th>
<th>Visual Analogue Scale</th>
<th>Short form McGill Pain questionnaire</th>
<th>Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Initial meeting</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>Baseline</td>
<td>A1</td>
<td>1:</td>
<td>x</td>
<td>x</td>
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<td>Period 1</td>
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<tr>
<td>3</td>
<td>Intervention</td>
<td>B</td>
<td>2:</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Period 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Follow up</td>
<td>A2</td>
<td>After period 2</td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

Note: Each x represents one instance of the measure

### 2.3. Sample

4 females in the age 20-40 suffering from dysmenorrhea were recruited through posters (Appendix 3) in the School of Health Science Department at the University in South Wales. The first 4 individuals who met the criteria were included in the study.

Inclusion Criteria used were severity of Dysmenorrhea higher than 5 on a 10 Point VAS and a regular menstrual cycle and age 20-40. Participants with systemic diseases/diseases of genital organs, use of contraceptives, use of other complementary therapies, allergies to used essential oils, *Myoma, Fibro cystadenoma*, use of analgesics at the period of intervention were excluded.
2.4. Data Collection Tools

A convergent parallel mixed method approach was used to collect data. Through incorporating the perspective of the individual, the researcher gains a better understanding of experimental results (Creswell, 2014).

**Convergent parallel mixed method approach**

**Figure 1 Mixed Method Approach**

Quantitative Data Collection and Analysis (Quan)

Qualitative Data Collection and Analysis (Qual)

**Visual Analogue Scale**

Visual Analogue Scale (VAS) was used to measure pain intensity (Appendix 7). Evidence suggests that VAS is a rather subjective scale, and that a high rating on the VAS is more consistent than low VAS ratings (Hayashi et al, 2015). Hayashi et al (2015) further argue that low ratings on the VAS are less objective which indicates poor repeatability. However, Kersten et al (2014) suggest that the pain VAS is a valid tool when measuring pain at one moment in time.
Short Form McGill Pain Questionnaire

The short form of the McGill Pain questionnaire (SF-MPQ) was used to investigate the quality of the pain (Melzack, 1987). The main part of the SF-MPQ is made up of 15 descriptors (11 sensory; 4 affective). The descriptors are rated on an intensity scale; 0=none, 1=mild, 2=moderate, 3=severe. The questionnaire also includes the Present Pain Intensity (PPI) index of the standard MPQ and a VAS (Appendix 7). When scores from SF-MPQ were compared to scores from MPQ there was enough high and significant correlation to justify the SF-MPQ as a useful tool when the standard MPQ takes too long to administer (Melzack, 1987).

Questionnaire

After the last period a short Questionnaire was emailed to participants (Appendix 2). A mix of 8 open and closed questions were used to collect feedback about the experience of participants during the study and to investigate any common trends. The following questions were asked:

1.) Could you please tell me about your experience of this research project?
2.) How easy was it to use and apply the oil?
3.) Where were other factors that influenced your period pain such as stress?
4.) Did you experience any side effects such as nausea or headaches?
5.) Did you experience skin irritation? If yes please specify your reaction.
6.) Would you use the oil again?
7.) Would you recommend the use of the oil to others?
8.) Is there anything else you would like to add?
2.5. Equipment

**TABLE 2 EQUIPMENT**

The following equipment was used by the researcher during the study.

<table>
<thead>
<tr>
<th>Baseline Meeting</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
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<td>Paper</td>
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<td>Glass bottle 50ml</td>
</tr>
<tr>
<td>Essential oils:</td>
</tr>
<tr>
<td>clary sage (<em>Salvia sclarea</em>), sweet marjoram (<em>Origanum majorana</em>),</td>
</tr>
<tr>
<td>Grape seed oil (<em>Vicus vinifera</em>)</td>
</tr>
<tr>
<td>Short Form McGill Pain questionnaire</td>
</tr>
<tr>
<td>Consent forms</td>
</tr>
<tr>
<td>Consultation form</td>
</tr>
</tbody>
</table>
2.6. Procedure

Prior to baseline all the participants were sent a participant information sheet (Appendix 5) to provide details about the study and ensure participants eligibility to participate in the study. If suitable a face-to-face meeting was organized at an acceptable time.

Initial meeting:

Each participant was given a bottle of grape seed oil premixed with 2 essential oils; sweet marjoram (*Origanum majorana*) and clary sage (*Salvia sclarea*) in a safe concentration of 4% (Price and Price, 2012; Balacs and Tisserand, 1995). The massage oil was blended by a qualified therapist. The oil was in a dark 50ml blue glass bottle to avoid oxidation (Balacs and Tisserand, 1995). Participants were advised to store the bottle in a dark place, with a temperature of 10-15 °C (Price and Price, 2012). Participants applied the oil on their abdomen instead of taking analgesics. Participants were instructed on how to apply the oil; the massage oil should be applied clockwise over the abdomen using slow, smooth and continuous effleurage strokes with a pressure of 3 on a 0-10 scale, 0 is no pressure and 10 is crushing pressure. The self-application lasted 5-10 minutes and was performed by the participant on the first day of their period when the highest pain was experienced. Intervention took place over 1 menstrual cycles. Instructions were given on the first interview.

Baseline:

Participants filled out the SF-MPQ on the first day of their first period at which they experienced the highest pain levels.

Intervention:

Participants filled out the SF-MPQ before and 10 min after intervention at the first day of their second period when they experienced the highest pain levels. Participants emailed the results to the researcher.

Follow up phase:

A questionnaire was emailed to participants to gather further qualitative data.
2.7. Ethical Considerations

The proposed research has been authorised by the University’s School of Health Sciences ethics committee on the 25th of January 2018 (Appendix 4). The ethics panel suggested slight alterations to the ethics form regarding participant recruitment and data confidentiality. After these alterations were made the ethics form was approved by the panel. The therapist was trained in Level 5 Aromatherapy massage and fully insured. The therapist holds an up to date first aid certificate and Disclosure Barring Service Check. At the first interview a full consultation was taken and the intervention process was explained to participants. In case of sensitive skin in any of the participants a patch test would have been carried out. However, none of the participants reported to have sensitive skin. The essential oils were blended by a qualified therapist at a safe percentage of 4% according to (Price and Price, 2012; Balacs and Tisserand, 1995). A risk assessment was carried out to minimize potential safety hazards (Appendix 8).

2.8. Data Security

At the initial meeting all participants filled out a consent form authorised by the University. Participants were fully informed about the aims of the research. Instead of names unique identifier codes were used to ensure confidentiality. All data was stored safely in a locked cabinet in the researcher’s home. Electronic data was stored in a password protected computer conforming to the regulations by the Data Protection Act 1988 (Legislation.gov.uk, 2018).

2.9. Data analysis

Data collected was mainly quantitative supported with qualitative data. Due to small number of participants and time restrictions of an undergraduate project, data was visualized and analysed in Microsoft Word instead of Statistical Package for Social Sciences (SPSS).
3.0. Results

3.1. Participants

4 female participants aged 20-25 were included in the study. All participants rated their period pain higher than 5 on a 0-10 VAS and had a regular menstrual cycle. None have systemic diseases of genital organs, myoma, fibro cystadenoma, allergies to the used essential oils. None were using contraceptives or analgesics the period of the intervention. The study took place over 2 menstrual cycles. All participants completed the study in full. However, no data on PPI scores could be collected from participant 400 and participant 300 didn't fill out the final questionnaire. Due to a lack of data and number of participants no SPSS could be carried out. The results were analysed and presented graphically in Microsoft word.

First an outline of group results is presented and then the individual results of each participant.

- Short Form McGill pain Questionnaire (SF-MPQ)
- Present Pain Intensity (PPI)
- Visual Analogue Scale (VAS)
- Questionnaires
3.2. Short form McGill pain questionnaire results

**FIGURE 2 SF-MPQ MEAN SCORES**

Figure 1 represents the mean scores for the quality of pain at baseline and before and after intervention. Questions 1-11 represent the sensory dimension of the pain experience. Question 12-15 represents the affective dimension of the pain. and highlights a decline in sharp (2 BB, 0.75 AB), cramping (2 BB, 1.25 AB), aching (2 BB, 0.75 AB), heavy (2 BB, 0.25 AB), sickening (1.5 BB, 1 AB) quality of pain over the course of the study.
3.3. Present Pain Intensity Results

**Figure 3 PPI Mean Scores**

Figure 3 represents the Present Pain Intensity scores at baseline at period 1, and before and after intervention at period 2 for participants 100, 200, 300. No data for 400 could be collected. This shows a downward trend across duration of the study as the mean level after intervention was lower than before intervention and baseline. There is a larger difference between pain intensity scores before/after intervention than between baseline and after intervention scores.
Figure 4: Individual Results for present pain intensity at baseline and before and after intervention for participants 100, 200, 300. No data for 400.

**Figure 4 Individual Results PPI**

Figure 4 shows a trend for a reduction in pain intensity in 3 participants (100, 200, 300). No data on PPI could be recruited from participant 400. Participant 300 scored 2 and 4 at period 1 and before period 2. The highest number provided for pain intensity (4) was used as the maximum value for the y axis.

In participant 200 a large difference between scores at period 1 (4) and before intervention at period 2 (8) can be seen, similar to VAS scores of participants 400. PPI scores of participants 100 and 300 remained unchanged at period 1 (100:3, 300:4) and before period 2, with a reduction in scores following intervention (100: 4, 300:2).
3.4. Visual Analogue Scale Results

Figure 5: Mean Scores for Visual Analogue Scale at baseline and before and after intervention for participants 100, 200, 300, 400.

**Figure 5 Mean VAS Scores**

![Mean VAS scores at baseline and before /after intervention](image)

Figure 5 identifies a difference of 3.75 in pain scores before/after intervention and a difference of 3 in pain scores at baseline compared to after intervention. This indicates an improvement in perceived pain levels after intervention.
Figure 6: Individual scores for visual analogue scale at baseline and before and after intervention for participants 100, 200, 300, 400.

**Figure 6 Individual VAS scores**

Figure 5 identifies a trend for a reduction in pain levels in all 4 participants. In participant 200 a large difference between scores at period 1 (4) and before intervention at period 2 (8) can be seen. After intervention there was a large reduction in scores for participant 200 (2). Scores of participants 100 and 300 are identical at period 1 (6) and before period 2 (6) with a reduction of scores following intervention (4).
3.5. Questionnaire

Trends and themes including quotes (No data for participant 300)

**TABLE 3 QUESTIONNAIRE QUOTES**

<table>
<thead>
<tr>
<th>Main Topic</th>
<th>Quotation</th>
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</thead>
<tbody>
<tr>
<td>General experience</td>
<td>“I enjoyed being a participant in this study. It helped relieve my period pain and overall it was a positive experience.” (200)</td>
</tr>
<tr>
<td></td>
<td>“I found the experience really interesting, especially to see how the massage oil affected my period pain versus how paracetamol and ibuprofen affect my period pain.” (400)</td>
</tr>
<tr>
<td>Comments about Pain levels</td>
<td>“My experience was that I used the oil as instructed, but I am unsure as to whether it worked or not because I could still feel pain when it had been applied to my stomach. I also get very painful back ache when on my period, and therefore cannot be sure whether the pain I felt was because of back ache or if the oil didn't work properly.” (100)</td>
</tr>
<tr>
<td></td>
<td>“I was also pleasantly surprised to see that the oil reduced my pain levels, especially the sharpness of the pain.” (400)</td>
</tr>
</tbody>
</table>
| Application of oil | “The oil was very easy to use, and to rub onto my belly area.”(100)  
It was extremely easy to use and apply the oil. The researcher told me the correct way to massage the oil in and how much to use so it made it easy for me.“ (200)  

“It was easy to open and use the oil. At first, I used my fingers to open the oil and apply it, but I found it better to use cotton wool to apply it. I also found the process of putting on the massage oil quite relaxing.” (400) |
|---|---|
| Smell of the oil | “the smell, I did not find it very pleasant and it was hard to wash from my hands, and also took a while to dry when on my skin.” (100)  

” I liked the smell of the oil. “(400) |
| Other influences on the period pain such as Stress | “I think stress influenced my period in coming a week earlier, but it doesn’t influence my period pain as I always have period pain every month, and this doesn't change with stress as far as I am aware.” (100)  

“Stress could have been a factor that influenced my period pain because I’m currently at the end of my studies with a lot of deadlines. “ (200) |
<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
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<tbody>
<tr>
<td>Possibly, I had a few deadlines when I took part in the study. I was also quite tired from placement and a busy work schedule when I took part in the study, which may have influenced my period pain.</td>
<td>“Possibly, I had a few deadlines when I took part in the study. I was also quite tired from placement and a busy work schedule when I took part in the study, which may have influenced my period pain. “(400)</td>
</tr>
</tbody>
</table>
| Adverse effects; nausea, headaches           | “From my period? Yes, I experience the side effect of feeling nauseous, queasy and like I want to throw up.” (100)
|                                              | “No, I experienced no side effects.” (200)                                |
|                                              | “No.” (400)                                                              |
| Skin reaction                                | “Not that I am aware of.” (100)                                           |
|                                              | “No skin irritation caused.” (200)                                        |
|                                              | “No.” (400)                                                              |
| Would you use the oil again?                 | “I am not sure if I would use the oil again as I do not really like the smell and I am also unsure if it worked properly on me.” (100) |
|                                              | “Yes, definitely.” (200)                                                 |
|                                              | “I would use the oil again.” (400)                                        |
| Would you recommend the use of the oil to others? | “Potentially, I would say that it was okay. “(100)                        |
|                                              | “Definitely. “(200)                                                     |
Trends and themes from the qualitative interviews:

- 2 out of 4 participants enjoyed taking part in the intervention (200, 400). Participant 400 found it interesting to observe the difference between the effect of painkillers and the application of the oil.
- 3 out of 4 participants found the oil easy to use (100, 200, 400). 100 found the application of the oil to the abdomen easy. 200 found the instructions of the researcher helpful in helping to apply the oil in the correct way. 400 started applying the oil with her fingers but then found it easier to use cotton wool to apply the oil.
- 2 out of 4 participants showed awareness of a relation between stress and period pain intensity (200, 400). Participant 100 suggests a possible link between stress and regularity of the period.
- None of the participants experienced adverse effects such as nausea or headaches from using the oil. 1 participant experienced nausea and sickness but attributes it to the period rather than the application of the oil (100).
- None experienced skin reactions
- The three participants who saw a change in pain levels during the study attribute the change to the application of the oil as part of the study (200, 400). Participant 100 experienced the smell of the oil as unpleasant and didn’t experience pain relief after the intervention possibly due to back pain.
- 2 out of 4 participants would use the oil again (200, 400). Participant 100 experienced the smell of the oil as unpleasant and didn’t experience pain relief from the intervention therefore is unsure about using the oil again.
3.6. Summary
There was a general trend amongst the group in present pain intensity findings towards a reduction. There was a general trend amongst the group in visual analogue scale findings for pain levels towards a reduction. In general, the pain showed a slight decline in heaviness, aching, sharpness and sickening character in the SF-MPQ scores. Themes emerging from questionnaires identify that participants pain levels may have changed and that participants attribute the change to taking part in the study. None of the participants experienced adverse effects from using the oil.

4.0. Discussion
4.1. Introduction
The purpose of this experimental study was to investigate the effect of self-applied aromatherapy massage to the abdomen, on pain levels in women suffering from dysmenorrhea, who manage their condition without the use of medication. The secondary purpose was to investigate the effect of aromatherapy massage on quality of pain in this participant group. The third purpose was to investigate the number of participants experiencing side effects from aromatherapy treatment. All four participants were female students in their twenties therefore the study lacks diversity. All participants completed the entire study.

The review of previous English language literature suggests that aromatherapy massage is more effective in reducing pain levels than massage or exercise. Clary sage (Salvia sclarea) blended with lavender (Lavandula officinalis) and rose (Rosa centifolia) was found to be effective in reducing menstrual pain in participants in a recent study by Han et al (2006). There is a lack of recent clinical studies on the effectiveness of clary sage (Salvia sclarea) and sweet marjoram (Origanum marjorana) in pain reduction. Anecdotal evidence suggests women experiencing side effects from taking nonsteroidal anti-inflammatory drugs (NSAIDs). However, as previous literature review showed, currently there is a lack of high quality research investigating the profile of participants experiencing side effects from NSAIDs, as a large amount of studies is commercially funded. Review of previous research suggests that aromatherapy massage could provide pain relief without side-effects.
4.2. Findings

Findings of this study raise the following points of interest:

- There was a trend to reduction in mean pain severity levels on the VAS for all 4 participants (100, 200, 300, 400) (Figure 5). In the individual results the greatest difference in before/after intervention scores could be seen in participants 200 (Figure 6).
- Mean PPI scores showed a trend to reduction before/after intervention in 3 participants (100, 200, 300) (Figure 3). However, no data could be recruited for participant 400. The highest difference in individual before/after intervention scores could be seen in participant 200 (Figure 4).
- The SF-MPQ results showed a greater reduction in mean affective scores than in mean sensory scores from all 4 participants (100, 200, 300, 400) (Figure 2).
- The overall mean scores for SF-MPQ showed a trend for reduction in quality of pain before/after intervention (Figure 2). In the individual SF-MPQ scores no trend in quality of pain experienced by participants could be identified (Appendix 1).
- All the participants that filled out the final questionnaire (100, 200, 400) suggested a link between stress and period pain (200,400) or regularity (100) in table 3. No questionnaire was received from participant 300.
- 0 out of 4 participants reported experiencing side-effects or skin irritation from using the oil. Participant 100 reports feeling nauseous but attributes it to the period rather than the application of the oil (Table 3).
These points of interest are considered in the discussion that follows:

These results are in line with those of previous studies by Apay et al (2012) and Bakhtshirin et al (2015) who found aromatherapy massage on the abdomen with lavender (*Lavandula officinalis*) essential oil is effective in reducing dysmenorrhea. However due to methodological limitations and time restrictions of an undergraduate project the results of this study didn’t reach clinical significance. A possible explanation for this might be the use of different essential oils in this study. Further research with larger sample size, and better control groups over a longer time period would need to be carried out to show an effect of clary sage (*Salvia sclarea*) and sweet marjoram (*Origanum marjorana*) on dysmenorrhea. The results of the SF-MPQ are in line with the trend towards a reduction in pain in all four participants (Figure 2). Even though there was a trend to reduction in quality of pain in the SF-MPQ individual results (Appendix 1) the data suggests that every participant experiences pain differently. 3 Participants (100,200,300) describe the quality of pain as sharp, cramping. 1 Participant (400) rates the pain as aching, heavy and tiring.
As mentioned in the literature review stress might affect dysmenorrhea. However, it is unclear in what way stress affects dysmenorrhea. Ju et al (2014) found that stress is positively associated with dysmenorrhea. Dehkordi et al (2017) suggests that stress could affect regularity of dysmenorrhea but not dysmenorrhea itself. The qualitative data from participants in suggests that stress could affect dysmenorrhea (Table 2). Participant 200 who reported the highest VAS scores before intervention suggests that “stress could have been a factor that influenced my period pain because I’m currently at the end of my studies with a lot of deadlines” (Figure 5).

Participant 400 who reported the highest VAS scores at baseline comments on the influence of stress on dysmenorrhea “Possibly, I had a few deadlines when I took part in the study. I was also quite tired from placement and a busy work schedule when I took part in the study, which may have influenced my period pain “ (Table 2). Participant 100 suggests that stress might have influenced regularity of menstrual cycle but not dysmenorrhea itself (Table 2). This study fails to measure external factors which might affect dysmenorrhea such as stress. In future studies stress levels could be measured using the perceived stress scale (PSS).

A strong relationship between age and dysmenorrhea has been reported in the literature. Ju et al (2014) suggests that dysmenorrhea improves with age, parity and use of oral contraceptives. All four participants included in the study were aged 20-25. None were taking oral contraceptives during the study period and none had given birth. This might have affected the result in participants reporting higher pain scores. No data on family history of dysmenorrhea was recorded.

None of the participants in this study reported side effects caused by the aromatherapy massage. Participant 100 reported nausea but attributed it to a symptom of dysmenorrhea rather than a side-effect of the application of the oil “from my period? Yes, I experience the side effect of feeling nauseous, queasy and like I want to throw up” (Table 2). A similar finding was reported by Kim et al (2011) where 1/63 participants reported nausea and it was unclear whether it was a side effect of intervention or dysmenorrhea. No data could be obtained from participant 300 on side effects (Table 2).
A possible explanation for the downward trend in pain scores could be the Hawthorne effect. Research suggests that participants modify a part of their behaviour or performance in response to being observed (McCarney, 2007). Participant 100 reported a dislike of the smell of the massage oil “the smell, I did not find it very pleasant and it was hard to wash from my hands, and also took a while to dry when on my skin.” (Table 2). This could have caused participant 100 to being biased against a positive effect of the intervention. However, as the condition addressed was physical the fact that participant didn’t like the oil shouldn’t have affected the pain scores.

Results of a study on the effect of self-applied aromatherapy massage on dysmenorrhea are consistent with previous studies in which participants received an aromatherapy massage to the abdomen (Kim et al, 2011). However, the qualitative data from this study suggest that although participants were given instructions on the application of the oil, not all participants followed the instructions. Participant 400 reports “at first, I used my fingers to open the oil and apply it, but I found it better to use cotton wool to apply it” (Table 2). Participant 400 using cotton wool to instead of applying the oil using the hands could influence the results. Price and Price (2012) suggest that warm oil and warm hands increase absorption.

A standardized treatment protocol applied by a therapist would ensure homogeneity of treatments and might increase the replicability of the study. Further if a researcher would provide aromatherapy massage treatments for participants, the researcher could ensure that participants answered all the questions in the SF-MPQ. In this study no data on PPI could be obtained from participant 400. Participant 300 added two answers per question in the SF-MPQ. This lack of data could have influenced the results of this study.
In this study 3 out of 4 participants send back the final questionnaire to the researcher. No data was obtained from participant 300 (Table 2). This could have influenced the results. Due to time restrictions of an undergraduate research project no final interview was carried out in this study. In future research, carrying out a final interview in person instead of emailing out questionnaires, could increase amount of qualitative data obtained. The final interview could be audio recorded.

Occlusion of massaged area due to a covering e.g. warm compress, reduces evaporation of essential oils and therefore increases absorption (Price and Price, 2012; Balacs and Tisserand, 1995). In future research occluding the massaged area after application of oil might increase the effect of intervention. No skin irritation was observed in this study. This could be due to safe dilution and dermal administration of essential oils. Topically applied oils will enter the bloodstream more slowly than orally administered oils and cause less toxicological effects than oral administration (Balacs and Tisserand, 1995). However, oral application of essential oils might be more effective as essential oils are absorbed quicker by body. Amount absorbed by oral dosage in 24 hrs is 8-10 times greater than by massage. However, this includes greater risk toxicity and is not allowed in the UK. Massage enhances absorption of essential oils into skin. (Balacs and Tisserand, 1995).
4.3. Limitations
The results of this study must be interpreted with caution. Due to specific group, setting, and history the results of this study cannot be generalized (Robson, 2011). The research group of 6 participants is too small to prove clinical significance. Participants were recruited from a narrow social group: all were undergraduate students at university this suggests a certain education level and wealth. Recruiting participants from different areas of society would increase diversity of the study. No recent papers published in the last 5 years could be retrieved on the effect of clary sage and sweet marjoram so older books/papers were used. Participants could be biased to a positive outcome of the intervention due to the researcher-respondent relationship. This is a problematic issue in all research involving people. In future research triangulation could be used to reduce the risk of bias. A greater amount of data collection methods could be used including interviews and documents. Using more than one researcher could reduce bias in future studies (Robson, 2011).

4.4. Future Research
Future research would need to be carried out over a longer period such as 3-4 menstrual cycles to take a baseline measure at the first cycle and 2 interventions possible a follow up measurement at cycle 4. Outcome measures such as the Perceived Stress Scale could be used to control for external factors affecting assessment of the effect of aromatherapy massage on dysmenorrhea. Participants were not blinded to treatment in this study. Due to the smell of the oil it is difficult to blind participants. In future studies a placebo group using a massage oil with artificial fragrance, could help to blind participants. A no-treatment control group would control for extraneous factors affecting the outcome of the study (Robson, 2011).

4.5. Conclusion
The results of this study did not show any significance of the effect of aromatherapy massage on dysmenorrhea. However, a trend towards reductions could be observed in pain intensity and quality of pain. Further research with larger sample size, a longer time period and greater diversity of participants is needed.
References


&query=


Appendices

Appendix 1: SF-MPQ Individual Results

**FIGURE 7 PARTICIPANT 100 SF-MPQ SCORES**
**200**

**FIGURE 8 PARTICIPANT 200 SF-MPQ SCORES**

![200 SF-MPQ scores at baseline and before/after intervention](image)

**300**

**FIGURE 9 PARTICIPANT 300 SF-MPQ SCORES**

![300 SF-MPQ scores at baseline and before/after intervention](image)
FIGURE 10 PARTICIPANT 400 SF-MPQ SCORES

400 SF-MPQ scores at baseline and before/after intervention

<table>
<thead>
<tr>
<th>Intensity</th>
<th>Throbbing</th>
<th>Shooting</th>
<th>Stabbing</th>
<th>Sharp</th>
<th>Cramping</th>
<th>Gnawing</th>
<th>Hot-burning</th>
<th>Aching</th>
<th>Heavy</th>
<th>Tender</th>
<th>Splittng</th>
<th>Tiring - exhausting</th>
<th>Sickening</th>
<th>Fearful</th>
<th>Punishing-cruel</th>
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<td>0</td>
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</tbody>
</table>

Quality of pain

- BP1
- BP2
- AP2
Appendix 2 Questionnaire

Title of project: The effect of Aromatherapy Massage on pain levels in females suffering from Dysmenorrhea

Participant Code:

Research Study Reference number: 9883

All your information is kept strictly confidential.

Please answer the following questions about your experience.

1.) Could you please tell me about your experience of this research project?
2.) How easy was it to use and apply the oil?
3.) Where their other factors that influenced your period pain such as stress?
4.) Did you experience any side effects such as nausea or headaches?
5.) Did you experience skin irritation? If yes please specify your reaction.
6.) Would you use the oil again?
7.) Would you recommend the use of the oil to others?
8.) Is there anything else you would like to add?

Thank you for filling out the questionnaire and participating in the study.
Appendix 3 Participant Recruitment Poster
PERIOD PAIN?

You are invited to participate in a twelve-week project starting in February 2018

Take part in a study exploring the effects of aromatherapy massage on period pain. Each participant will receive a bottle of massage oil with essential oils to apply to their abdomen when they are experiencing period pain. Due to the assessment of pain levels, there are several factors that may influence pain levels. Therefore, you are unable to take part if:

- You are pregnant.
- have no systemic diseases/diseases of genital organs, no use of other complementary therapies, no allergies to the used essential oils, Myoma, Fibro cystadenoma,
- no use of analgesics at the period of intervention.

Are you between the age 20-35?

Study carried out by Aromatherapist qualified in level 5 clinical Aromatherapy

Apply today

Contact via my supervisor:
Appendix 4 Ethics approval letter

Thursday, 25 January 2018 cshs/ethics /approved

Dear Applicant Re: Application for Ethical Approval: The effect of Aromatherapy Massage on pain levels in females suffering from Dysmenorrhea Project Reference Number: 9883

Your ethics application, as shown above, was considered by the Health Care and Food Ethics Panel on 24/01/2018. I am pleased to inform you that your application for ethical approval was APPROVED. Minor issues may still need addressing before you commence any work – if so these will be listed below.

N/A

Where changes to the information sheet, consent form and/or procedures are deemed necessary you must submit revised versions to the relevant ethics inbox. If you are a student – your supervisor must do this on your behalf.

Note: Failure to comply with any issues listed above will nullify this approval.

Standard Conditions of Approval 1. Your Ethics Application has been given a Project Reference number as above. This MUST be quoted on all documentation relating to the project (E.g. consent forms, information sheets), together with the full project title.
2. All documents must also have the approved University Logo and the Version number in addition to the reference and project title as above
3. A full Risk Assessment must be undertaken for this proposal, as appropriate, and be made available to the Committee if requested.
4. Any changes in connection to the proposal as approved, must be referred to the Panel/Committee for consideration without delay quoting your Project Reference Number. Changes to the proposed project may have ethical implications so must be approved.
5. Any untoward incident
which occurs in connection with this proposal must be reported back to the Panel without delay.

6. If your project involves the use of human samples, your approval is given on the condition that you or your supervisor notify the HTA Designated Individual of your intention to work with such material by completing the form entitled “Notification of Intention to Work with Human Samples”. The form must be submitted to the PD (Sean Duggan), BEFORE any activity on this project is undertaken.

This approval expires on 24/01/2019. It is your responsibility to reapply / request extension if necessary.
Participant Information Sheet

Project Title: The effect of Aromatherapy Massage on pain levels in females suffering from Dysmenorrhea.

Reference Number: 9883
Researcher:
Supervisor:

You have been invited to take part in the above project. Participation in this project is entirely voluntary.

Background to study
This research study will investigate whether Aromatherapy Massage has an effect on pain levels in females age 20-35 who suffer from dysmenorrhea.

The researcher hopes that this small study will help the people who take part to be able to reduce their menstrual pain levels. Commonly painkillers are prescribed for Dysmenorrhea and it is hoped that if any positive results are found from this study it would help more research to be carried out into alternative treatments of Dysmenorrhea.

The study will start around the 1st February 2018 and run for 8 weeks, up to 1st April 2018. Taking part is entirely voluntary and you can withdraw at any time during that 8 weeks.

What is Aromatherapy?
Aromatherapy uses essential oils derived from plants to improve psychological and physical well-being. In Aromatherapy Massage, essential oils are mixed with the massage oil and applied to the skin.

**Why have I been invited to take part?**
You have been asked to take part in this study as you are aged 20-35 years and suffering from Dysmenorrhea higher than five on a 10 Point VAS, which you are managing through diet and lifestyle, without medication or contraceptives and you have a regular menstrual cycle.

You have also let me know that you have no systemic diseases/diseases of genital organs, Myoma, Fibro cystadenoma, allergies to the essential oils used. Further please let me know if you are using any contraceptives, analgesics, other complementary therapies, if you have an IUD in place.

You have not had any recent surgery, are pregnant, or currently seeing your GP for any other serious condition.

**What if I do not want to take part?**
You do not have to join the study. Taking part is completely voluntary. We are grateful to you and thank you for taking the time to think about it.

If you decide you would like to join but then change your mind you can withdraw, without giving a reason, at any time up to 1st of April 2018 using the contact details at the bottom of this information sheet.

**What if I would like to take part?**
If you agree to join the study:

- You'll attend a one-to-one meeting at University in south wales with the researcher who will explain the aims of the study and answer any questions you have.
- Need to complete and sign a consent form confirming that you are happy to take part.
- A therapist, who is qualified to level 5 in Clinical Aromatherapy, will carry out an in-depth health questionnaire to understand your medical history,
how you manage your dysmenorrhea condition and to have a clear understanding of your general health and lifestyle.

- Be asked to rate your pain levels on a Visual analogue scale (VAS). (with the therapist present)
- Complete a questionnaire about the quality and character of the pain. You do not have to answer any question that you feel uncomfortable with.
- Highlight any symptom that particularly bothers you.
- Agree to use the essential oil mixture when you are experiencing period pain.

**Next Steps**

The study will take place over 2 menstrual cycles. You will attend a short interview session at a University in south Wales where I will go through a Consultation and Consent form with you and explain you the project. On the first day of your period in cycle 1 you will be asked to rate your pain on the VAS and fill out the McGill pain questionnaire. On the first day of your period in cycle 2 you'll receive a bottle of massage oil that you will apply to your abdomen when you are suffering from period pain. The application will take about 5-10 min in your own home. 10min before and after the application you will be asked to rate your pain on the VAS. You’ll be asked to complete the same McGill Pain questionnaire. Then you will attend to a final meeting with the researcher. The therapist will ask you how you found the previous treatment and if there are any changes to your health since. You'll also be asked about any other symptom/s that you mentioned in your first meeting.

**How much of my time will the study take?**

<table>
<thead>
<tr>
<th>Session</th>
<th>Cycle</th>
<th>Task</th>
<th>Location</th>
<th>Time in hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Short interview</td>
<td>University</td>
<td>Up to 1,5 hours</td>
</tr>
<tr>
<td>2</td>
<td>1: Period 1</td>
<td>McGill Pain questionnaire and VAS</td>
<td>Participants Home</td>
<td>Up to 1 hour</td>
</tr>
<tr>
<td>3</td>
<td>2: Period 2</td>
<td>Application 1 and VAS measurements, McGill Pain and VAS measurements</td>
<td>Participants Home</td>
<td>1 hour</td>
</tr>
</tbody>
</table>
Total amount of time for the study = approximately 5 hours over 9 weeks

Session 1 and 4 will take place at the Clinic at University

Sessions 2-3 will take place in participants homes.

**Do I have to pay for anything?**

Aromatherapy products are free of charge.

No travel or other personal expenses are covered. This is at your own cost. If you need information on timetables and costs of buses and trains to the University please ask!

**Will everything be private and confidential?**

We take your privacy very seriously. Steps have been taken to make sure that all information is strictly confidential and that your privacy is protected, so that you cannot be identified.

Information will be stored securely in a locked cabinet and can only be accessed by authorised people, such as the researcher, university tutor. The consent form, which includes your name, address and contact number, will be stored at the University site and will not leave the premises at any time. At the end of the study we will destroy all research information. We will only keep the consent form, which we have to keep for 5 years to comply with University regulations.

You have the right to see any of the information that we hold about you at any time.

**Are there any benefits from taking part?**

All treatments and advice as part of the study are free of charge.

**Are there any risks?**

There are no known risks to your health of using aromatherapy products. You may experience some discomfort from common mild symptoms such as increased urination, tiredness, heightened emotions and changes in body temperature, for
example, feeling cold. A thorough health consultation is carried out at the first meeting to make sure that you are in good enough health to take part in the project. If, at any time during the study, you or the therapist have any concern about your health you may need to withdraw from the study.

**What happens to the results of the study?**
All records of measurements taken are coded so that names and personal details are removed, so no-one taking part can be identified. The results will be used as part of a University 3rd year student research project. We’d be happy to send you a copy of the final research report if you’d like one.

**What if I have more questions?**
We welcome any questions. You can make contact through the University tutor whose details are below and is the supervisor for this research project. Please mention the research study reference number shown at the top of this information sheet.
PARTICIPANT CONSENT FORM

Research Study Reference Number: 9883
Participant Study ID Number:
Title of Project: The effect of Aromatherapy Massage on pain levels in females suffering from Dysmenorrhea
Name of Researcher:

Participant to complete this section: Please initial each box.

I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

I understand that my participation is voluntary and that I am free to withdraw at any time prior to the data analysis stage, (...01/03/2017...), without giving any reason.

I agree to take part in the above study
Signature of Participant ___________________________                Date ___________________________

Name of person taking consent ___________________________                Date ___________________________

Signature of person taking consent ___________________________

* When completed, 1 copy for participant & 1 copy for researcher site file
Appendix 7 Outcome measure: Short Form McGill Pain Questionnaire

Figure 4. The short-form McGill Pain Questionnaire. Descriptors 1–11 represent the sensory
## Appendix 8 Risk Assessment Form

<table>
<thead>
<tr>
<th>Name of person conducting risk assessment:</th>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Venue:</th>
<th>Location of first-aid kit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>University in south wales</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address (if applicable):</th>
<th>Is it stocked and maintained?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Yes □ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location:</th>
<th>Location of first-aider:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complementary Healthcare Clinic</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional notes:</th>
<th>Location of nearest telephone:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Person in charge of facility:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of Hazard</th>
<th>Evaluation of Risk (high/med/low)</th>
<th>Action(s) to Minimise Risk</th>
<th>Person to Advise if Risk is Outside Own Competence to Assess</th>
<th>Re-evaluation of Risk (high/med/low)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trip Hazard for patients and therapist; Massage couch cable plugged in</td>
<td>med</td>
<td>Unplug cable after use and store it tidy</td>
<td>n/a</td>
<td>low</td>
</tr>
<tr>
<td>Risk of Skin Irritation from essential Oils for individual patient</td>
<td>med</td>
<td>Use of a safe concentration of essential oils Oils blended by qualified aromatherapist</td>
<td>n/a</td>
<td>low</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Risk for the Patient to be swallowing the essential oils and being poisoned</td>
<td>med</td>
<td>Advice given on the application of essential oils</td>
<td>n/a</td>
<td>low</td>
</tr>
</tbody>
</table>
AROMATHERAPY CONSULTATION

CLIENT CODE: __________________________
OCCUPATION: __________________________
REASON FOR TREATMENT _____________________________________________
REFERRED BY __________________________________________________________

CONSENT FORM COMPLETED AND SIGNED □
MOBILE PHONE ON SILENT □

- You have been asked to take part in this study as you are aged 20-35 years
- Dysmenorrhea higher than five on a 10 Point VAS
- NO medication; analgesics or contraceptives
- regular menstrual cycle.

You have also let me know that you have
- no systemic diseases/diseases of genital organs,
- no Myoma, Fibro cystadenoma,
- allergies to the essential oils used.

Further please let me know
- if you are using any other complementary therapies
- if you have an IUD in place.

You have not had
- no recent surgery,
- are pregnant
- , or currently seeing your GP for any other serious condition.
LIFE STYLE

Diet

Good / Average / Poor (according to client)

Balanced

Fruit and vegetables

Fluid intake (water, caffeine, alcohol, other)

Smoking present/past No. per day High / Low tar / other

Hobbies

Exercise (type, frequency, duration)

Sleep: Refreshed on waking Y / N Uninterrupted / Interrupted

Ease of getting to sleep / Duration

Stress Levels (0-10) Home Work Other

SKIN TYPE

Body Normal ( ) Dry ( ) Dehyd ( ) Combination ( ) Sensitive ( )
Oily ( ) Problems

Facial Normal ( ) Dry ( ) Dehyd ( ) Combination ( ) Sensitive ( )

Oily ( ) Problems

Skin Conditions / Eczema / Psoriasis / Sensitivities (location/treatment)

DETAILS OF OTHER PRACTITIONERS

MEDICAL HISTORY

Medication (reason/name/length of course/side effects)

Operations (dates/problems/scarring)

Allergies

Blood pressure problems

Asthma

Sinus / Chest Problems (type/severity/frequency)

Epilepsy (severity/frequency)
**Diabetes** (severity/insulin/diet controlled)

**Broken Bones** (dates/weakness/pain)

**Spine/Back Problems** (dates/weakness/pain)

**Circulation and Circulatory Problems** (thrombosis/angina/heart attacks/Raynauds disease)

**Varicose Veins** (R/L leg/severity/treatments)

**Fluid Retention** (hormonal/injury/diet/location)

**Digestion** (bowels/IBS/frequency)

**Headaches** (frequency/severity)

**Nervous Tension** (nail biting/IBS/headaches)

**Depression** (hormonal/life/illness/frequency/treatment)

**Do you care for someone who is ill/disabled?**  Yes / No
No. of Children | Ages | Gender

Pregnant at present? | Yes / No

Menstrual cycle | regular | current | painful | other

Duration?

P.M.S | Yes / No | Symptoms / Treatments

Cancer (dates/current progress)

Other serious illness (dates/lasting problems)

ADDITIONAL INFORMATION (including areas not to massage & aroma preferences)

Patch Tests: | Oils | Test Area | Results
Disclaimer

The information I have given is correct, to the best of my knowledge, and I understand that the treatment I have agreed with my practitioner is based on this information.

I confirm that I have signed the ‘Consent to Treatment’ form.

I acknowledge that it is my responsibility to notify my practitioner of any conditions which may affect the treatment.

I understand that the University is not responsible for any adverse reaction that may occur from products purchased for home use.

Client Initials: Date

Practitioner Student Number: Date
**Word count**

Total: 8117

Abstract: 250

Literature Review: 3831

Method: 1.199

Results: 915

Discussion: 1922