Abstract of thesis entitled

“An Evidence Based Guideline of Aromatherapy in Pain Relief for
Dysmenorrhea Patient in Gynecology Ward”

Submitted by

Tong Po Yee

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at The University of Hong Kong

in July 2015

Dysmenorrhea is a typical gynecology problem that women experienced during
menstruation. It is presented with pain and cramp over lower abdomen, sometimes it
is accompanied by headache, nausea, vomiting or diarrhea. It is an unpleasant
experience which results in a negative impact on women’s physical health and daily
life. The prevalence of dysmenorrhea is not rare to see. As reported by World Health
Organization (WHO) in 2006, dysmenorrhea prevalence is up to 81% in 20 high
quality studies. In Hong Kong, local surveys show that around 68.7 % to 80 % among
the studying subjects experienced dysmenorrhea.
Traditional pharmacological therapy is associated with medication dependence and side effects. Recent studies suggested aromatherapy as an effective non-pharmacological therapy for dysmenorrhea in pain relief. Yet it is not a common alternative chosen by patients in Hong Kong local hospital, including the target gynecology ward. Thus, a translational study is conducted to formulate an evidence-based guideline of aromatherapy in pain relief for dysmenorrhea patients, to assess its transferability and feasibility and to develop the implementation plan and the evaluation plan.

Five relevant studies were identified from five different electronic bibliographic databases under a systematic search. According to the recommendation from Scottish Intercollegiate Guidelines Network (SIGN) grading system, critical appraisal and level of evidence were conducted on the five identified studies for the quality assessment. Table of evidence was developed to summarize the findings. All of the five identified studies support the use of aromatherapy is effective in pain relieve for dysmenorrhea patients with statistical significant shown.

The implementation potential in the target ward was examined. It was feasible and transferable to be implemented in the target ward. Also, benefits outweighed the costs. Then, implementation plan was planned including communication plan with
different stakeholders and a two-month pilot test. Revision of the proposed guideline could be carried out before a full-scale program is implemented.

Lastly, evaluation plan was develop for assessing the effectiveness of the proposed program. Reduction in pain, staff and patients’ satisfactory level, staff knowledge and cost of the program will be measured. Further modification of the program guideline would be considered to yield a better outcome in the future.
An Evidence Based Guideline of Aromatherapy in Pain Relief for
Dysmenorrhea Patient in Gynecology Ward

By

Tong Po Yee

B.Nurs. H.K.U.

A thesis submitted in partial fulfillment of the requirement for
the Degree of Master of Nursing
at the University of Hong Kong
July 2015
Declaration

I declare that this dissertation represents my own work, except where due acknowledgement is made, and that it has not been previously included in a theses, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualification.

Signed ________________________________________

Tong Po Yee
Acknowledgements

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Besides, I would like to deeply thank my family and fiancé for their love and caring. With their contribution and backup in my life, I could complete this dissertation and master program without worries.
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## Abbreviations

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<tbody>
<tr>
<td>AED</td>
<td>Accident and Emergency Department</td>
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<tr>
<td>APN</td>
<td>Advanced Practice Nurse</td>
</tr>
<tr>
<td>CNE</td>
<td>Continuing Nursing Education</td>
</tr>
<tr>
<td>COS</td>
<td>Chief of Service</td>
</tr>
<tr>
<td>DOM</td>
<td>Departmental Operational Manager</td>
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<tr>
<td>EBP</td>
<td>Evidence Based Practice</td>
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<tr>
<td>HCA</td>
<td>Health Care Assistants</td>
</tr>
<tr>
<td>NRS</td>
<td>Numeric Rating Scales</td>
</tr>
<tr>
<td>NSAID</td>
<td>Non-Steroid Anti-Inflammatory drug</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomized Controlled Trial</td>
</tr>
<tr>
<td>RN</td>
<td>Registered Nurse</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
</tr>
<tr>
<td>VAS</td>
<td>Visual Analogue Scale</td>
</tr>
<tr>
<td>VRS</td>
<td>Verbal Rating Scale</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<td>WM</td>
<td>Ward Manager</td>
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CHAPTER 1

INTRODUCTION

Dysmenorrhea is a common gynecology problem. Both pharmacological and non-pharmacological therapy is available for dysmenorrhea. Despite of the universality of pharmacological therapy, different studies and researches have documented the effectiveness of non-pharmacological therapy towards dysmenorrhea. In this chapter, the background, the affirming needs, the significance and objectives of a non-pharmacological therapy i.e. aromatherapy will be addressed.

1.1 Background

Dysmenorrhea is a typical gynecology problem which majority of the women experienced during menstruation. It is a condition of pelvic pain during one’s menstruation. It can be classified as primary and secondary. Primary dysmenorrhea refers to pelvic pain without underlying pathology, while secondary dysmenorrhea refers to pelvic pain associated with underlying pathology such as endometriosis, uterine fibroid or pelvic infection (Dawood, 1990; Spears, 2005). It is believed that primary dysmenorrhea is the result of increased release of a hormone called prostaglandins during menstruation. Prostaglandins trigger uterine vessel constrictions and muscle contractions. Thus, menstrual pain and cramp is induced (Marzouk,
El-Nemer, & Baraka, 2013). The pain can be presented as sharp and intermittent cramp over lower abdominal region which accompanied by headache, nausea, vomiting, diarrhea, a bloated feeling (Spears, 2005). The duration and severity of dysmenorrhea varies among women. Some of them experience mild pain during menstrual cycle, while some experience severe pain with heavy menses flow which can significantly interfere with their daily activities.

Women experience differently during dysmenorrhea. Apart from lower abdominal cramp and pain, other menstruation-related symptoms such as dizziness, nausea, vomiting, diarrhea and fatigue may be accompanied (Chan, Yiu, Yuen, Sahota, & Chung, 2009; Doty & Attaran, 2006). Pain is an unpleasant feeling, self-concept and experience. Pain also induces physical changes like high blood pressure or increased heart rate etc. Other physical symptoms like sweating or chills may also occur. All these symptoms may result in a negative impact on women’s individual physical health.

According to a systematic review done by World Health Organization (WHO) in 2006, the prevalence of dysmenorrhea is up to 81% in 20 high quality studies with representative samples. Narrowing down to Hong Kong situation, the prevalence of dysmenorrhea among Hong Kong women is not low. A study done by Chia et al. (2013) shows that 80% of the studying subjects experienced dysmenorrhea. Besides,
another survey also shows that dysmenorrhea occurs in 68.7% among 5609 subjects (Chan et al., 2009). It can be observed that dysmenorrhea is not a rare situation. It can be estimated that quite a number of women are experiencing dysmenorrhea every month with different level of severity.

1.2 Affirming the Needs

In general practice, pharmacological therapy is most commonly used e.g. Non-Steroid Anti-Inflammatory drugs (NSAIDs), hormone medications and oral contraceptives. Pharmacological therapy is a conventional method. However, not all women respond to pharmacological therapy. With the potential side effects of NSAIDs including gastro-intestinal upset, dizziness, headache, nausea and peptic ulcer, it will lead to around 20% failure in alleviating primary dysmenorrhea (Ou, Hsu, Lai, Lin, & Lin, 2012; Proctor & Farquhar, 2006). And some medication needs to be used regularly (Doty & Attaran, 2006). It will lead to dependence of medication. There is increasing number of women seeking for alternatives in managing dysmenorrhea as some of them are with contraindications or do not respond to traditional therapy (Lloyd & Hornsby, 2009).

Recently, many alternatives non-pharmacological therapy are available. Previous studies suggested that a non-pharmacological therapy - aromatherapy are potentially
effective for dysmenorrhea in pain relief (Marzouk et al., 2013; Ou et al., 2012). Aromatherapy refers to the therapeutic use of essential plant oil which can be absorbed via skin or olfactory system (Han, Hur, Buckle, Choi, & Lee, 2006; Hur, Lee, Seong, & Lee, 2011; Kim, Lee, Yang, & Hur, 2011; Marzouk et al., 2013). It is suggested to be symptom-relieving by enhancing the release of neurotransmitters, such as endorphins which have an analgesic effect (Potts, 2009). It is an inexpensive and safe therapy which can be nurse-delivered or patient-delivered (Han et al., 2006; Hur et al., 2011; Marzouk et al., 2013; Ou et al., 2012). It can be delivered by massage, inhalation or bath. Aromatherapy with massage is suggested to be a relaxing and calming way to promote blood circulation, reduce muscle spasm and thus, improve dysmenorrhea (Apay, Arslan, Akpinar, & Celebioglu, 2012; Han et al., 2006; Marzouk et al., 2013). Through massage, essential oil can be both absorbed via skin and inhaled. In general, aromatherapy in nursing practice provides a better holistic nursing care for patients as an adjunct to the conventional treatment.

My local setting is a gynecology ward in a public hospital. A number of patients are admitted for dysmenorrhea. They are often prescribed with Ponstan, which is a type of NSAID, for symptom relieving. Antacids, such as Triact, are often prescribed together with Ponstan for relieving the side effect of NSAID such as gastro-intestinal bleeding, and gastro-intestinal upset. In some severe cases, injection of pain killer is
needed. Patients are hospitalized for a few days for observation until pain is relieved. Some patients may even need regular readmission for symptoms relief. Regular readmission may increase the chance of getting hospital-acquired infection as well.

Overall, nurses’ role on dysmenorrhea patients is relatively weak in my own clinical setting. As previous studies suggested, aromatherapy in managing dysmenorrhea is safe and inexpensive which can be nurse-delivered or patient-delivered. Nurses can manipulate and provide additional care and information for dysmenorrhea patients via aromatherapy. Despite of the potential of aromatherapy in pain relief for dysmenorrhea, an evidence-based guideline is needed to support the innovation in my local setting. A translational study is needed to be conducted in order to develop this potential innovation of delivering aromatherapy for dysmenorrhea patients.

1.3 Objectives and Significance

1.3.1 Objectives

The objectives of this study are listed below:

1) To perform a systematic search of relevant literature related to the use of aromatherapy in alleviating pain for dysmenorrhea patients.

2) To extract data from the identified literatures and form a table of evidence.
3) To perform quality assessments on the identified literatures.

4) To summarize and synthesize the findings from the identified literatures.

5) To develop an evidence-based guideline on the use of aromatherapy in alleviating pain for dysmenorrhea patients.

6) To assess the implementation potential of the proposed guideline in local setting.

7) To develop an implementation plan and evaluation plan for the innovation proposed.

1.3.2 Significance

In view of individual aspect, dysmenorrhea patients suffer from psychological discomfort and an undesirable social life apart from physical discomfort. Anxiety and stress would be another consequence from dysmenorrhea (Proctor & Farquhar, 2006). Dysmenorrhea may render a woman incapacitated for a few days during menstruation (Dawood, 1990). Self-treatment like paracetamol, warm pad or bed resting is common to women who suffer from mild dysmenorrhea (Chan et al., 2009; Chia et al., 2013). However, some women may need to attend physician or Accident and Emergency Department (AED) for analgesic medication injection for pain relieving. Repeatedly admission to gynecology ward for painkiller injection and observation is not uncommon. Non-participation in activities or even absenteeism from school or work
is unavoidable. And it develops a negative impact on their role. Their self-esteem, social life and activities are highly affected.

For the public, the impact of primary dysmenorrhea towards the society should not be overlooked. It was estimated that absenteeism from school and work would cause $600 million working hours and $2 billion loss per year in the US (Doty & Attaran, 2006). The productivity, creativity and work performance will also be decreased (Dawood, 1990). According to a local Hong Kong survey (Chan et al., 2009), around 12.1% of subjects reported absenteeism due to dysmenorrhea. The productivity and potential economic loss is foreseeable to Hong Kong as well.

Although dysmenorrhea is not life-threatening, it has a negative impact on women’s life. No matter the severity of dysmenorrhea, it is beneficial to all that woman can be relieved from pain and discomfort from dysmenorrhea. Despite the high occurrence as mentioned, dysmenorrhea is not managed effectively. A better protocol is needed for women to access health care resources, as well as the development of appropriate treatment (Latthe, Latthe, Say, Gulmezoglu, & Khan, 2006). Such a potential evidence-based guideline is not yet available in my local clinical setting. In order to provide an effective non-pharmacological alternative for our dysmenorrhea patients, an evidence-based guideline about aromatherapy for dysmenorrhea patients is needed to be further addressed. By introducing this effective
and evidence-based guideline, both women’s physical and psychological health can be improved. And the public health and economy can also be improved in terms of non-participation or absenteeism from school and work is minimized.
CHAPTER 2

CRITICAL APPRAISAL

To extract useful data and findings from the miscellaneous literatures, a systemic search of relevant literatures is an essential part. In this chapter, the searching strategy for relevant literatures and critical appraisal on the identified literatures will be discussed.

2.1 Search and Appraisal Strategies

2.1.1 Translational Nursing Research Question

To develop an evidence-based guideline, a searchable and answerable question in PICO format - “What is the effectiveness of aromatherapy in alleviating pain for dysmenorrhea patients?” is raised to solve and answer the identified issue.

The research question presented in PICO format is shown as below:

Population of Interest (P): Primary dysmenorrhea patients

Intervention (I): Aromatherapy

Control (C): No treatment

Outcome (O): Pain alleviation
2.1.2 Identification of studies

To search for the relevance literatures, 5 different electronic bibliographic databases including MEDLINE, PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL Plus), The Cochrane Library and British Nursing Index were searched from May 2014 to September 2014.

Separated keywords search were conducted. They were divided into two main groups: Intervention and Target Population. For intervention, 1) aromatherapy, 2) aromatic, 3) aroma and 4) essential oil were searched as keywords. For target population, 5) dysmenorrhea, 6) menstrual pain and 7) menstrual cramp were searched as keywords. Interrelated keywords were combined with “OR” and searched in both intervention and targeted population group respectively. Then, the result from these two groups was combined with “AND” and searched again. Results obtained were screened by title and abstract. The relevant literatures are selected in each database. The duplicated literatures were eliminated. Besides, a manual search was performed from the references of selected literatures in order to explore more potential literatures. The details of the searching history are presented with a Prisma flow diagram (Shamseer et al., 2015) as shown in Appendix A.
2.1.3 Inclusion Criteria

- Primary dysmenorrhea patients as studying subjects (Population)
- Aromatherapy with massage as studying intervention (Intervention)
- Pain as outcome measure (Outcome)
- Full text is available

As mentioned in chapter one, aromatherapy with massage is suggested to be a relaxing and calming way to improve dysmenorrhea in which essential oils can be both absorbed via skin and inhaled. So that aromatherapy with massage as a delivery mode is the interested part and chosen as the inclusion criteria. Primary dysmenorrhea in the targeted population and pain is the interested outcome that stated in the research question. They are chosen as the inclusion criteria as well.

2.1.4 Exclusion Criteria

- Pharmacological therapy as the compared group (Control)
- Languages other than English or Chinese

In the meanwhile, pharmacological therapy is known as the first line and effective pain relief method. In this study, aromatherapy as the addition comfort alternatives is interested, other than the pharmacological therapy. A pharmacological
therapy is not expected to be compared with aromatherapy. Thus, studies which involved pharmacological therapy as the compared group are excluded.

2.1.5 Data Extraction

There are 75 papers related to aromatherapy for dysmenorrhea retrieved from the 5 electronic bibliographic databases. By narrowing down according to the inclusion and exclusion criteria, 5 eligible papers are selected (Apay et al., 2012; Han et al., 2006; Kim et al., 2011; Marzouk et al., 2013; Ou et al., 2012). There is no extra eligible paper found from the references of the selected papers. Overall, total 5 papers, which were conducted from 2006 to 2013, are selected and reviewed. They are listed in Appendix B.

Data from the 5 selected papers are summarized into a table of evidence, which is categorized into Bibliographic Citation, Study Type, Level of Evidence, Patient Characteristics, Intervention, Comparison, Length of Follow Up, and Result. Details of the tables of evidence are presented in Appendix C.

2.1.6 Appraisal Strategies

To assess the quality of the 5 selected papers, an appraisal checklist from Scottish Intercollegiate Guidelines Network (SIGN) is used. Level of evidence is
graded according to the recommendation from SIGN grading system 1999 – 2012 as shown in Appendix D. The details of quality assessment are illustrated in Appendix E.

2.2 Results

The overall study characteristic and methodological issue is discussed briefly as below and shown in Appendix E.

2.2.1 Studies Characteristic

Among the 5 selected papers, 3 are randomized controlled trials (RCT) (Han et al., 2006; Marzouk et al., 2013; Ou et al., 2012) and 2 are quasi-experimental designs (Apay et al., 2012; Kim et al., 2011). They were conducted in Egypt (Marzouk et al., 2013), Korea (Han et al., 2006; Kim et al., 2011), Taiwan (Ou et al., 2012) and Turkey (Apay et al., 2012).

They all performed aromatherapy by massage as the intervention and conducted studies at single site i.e. hospital (Kim et al., 2011; Ou et al., 2012) or university (Apay et al., 2012; Han et al., 2006; Marzouk et al., 2013). Sample sizes are ranged from 44 to 95 among the papers. All papers obtained informed written consent from the subjects except Ou et al. (2012) did not mention about consent.
2.2.2 Methodology

All selected papers stated their focused question or purpose clearly with population, intervention, comparison and outcome measure noted.

Regarding randomization, it was mentioned in all 3 RCTs (Han et al., 2006; Marzouk et al., 2013; Ou et al., 2012). Block-of-four randomization was used by Marzouk et al. (2013) and randomized number chart was mentioned by Ou et al. (2012).

For allocation concealment, it allows the researchers unaware of the treatment group before subjects enter the study. It can prevent overestimation of the intervention effect (Melnyk & Fineout-Overholt, 2011). Only Marzouk et al. (2013) showed adequate concealment with concealed envelope used. Han et al. (2006) drew paper with A, B, or C written on from a closed box. And Ou et al. (2012) did not mention about the concealment.

For blinding, double blinding towards subjects and researchers are mentioned in 2 RCTs (Marzouk et al., 2013; Ou et al., 2012). And Han et al. (2006) did blinding towards subjects only.

For the remaining 2 quasi-experimental designs, randomization and concealment are not applicable in their design (Apay et al., 2012; Kim et al., 2011).
Subjects recruited and allocated into groups are reported with no big difference in all 5 selected papers. The baseline data e.g. mean age, height, duration of pain and pain score are reported with no significant differences shown. About the dropout rate, all papers reported with no dropout rate except Kim et al. (2011) reported overall 12.7% dropped out. All the outcome measure tools used are standard, reliable and valid i.e. Visual analogue scale (VAS) and Numeric rating scales (NRS).

The statistical analyses are conducted among the papers by SPSS software with significant difference reported as described in Appendix B.

2.2.3 Level of Evidence

Overall, the level of evidence among them ranged from 1++ to 1-. RCT study from Marzouk et al. (2013) is graded as 1++ due to an adequate well methodology design with block-of-four randomization, allocation concealment and double-blinding applied which can minimize bias. Two of the RCTs are graded as 1+ (Han et al., 2006; Ou et al., 2012) because of the inadequate concealment and blinding method. And the remaining two papers (Apay et al., 2012; Kim et al., 2011) are quasi-experimental design. A non-randomized and non-blinded design may constitute with high risk of bias. Thus, they are rated as 1-.
2.3 Summary and Synthesis

The data from the 5 papers are summarized as below and shown in Appendix C by a table of evidence.

2.3.1 Summary

2.3.1.1 Patients’ Characteristics

Patients’ characteristics are similar among the studies. All subjects enrolled were female with mean age from 19.9 to 25. Subjects were recruited with similar criteria which are: 1) with menstrual pain scored ≥ 6 out of 10 by VAS or NRS, 2) with no systematic disease or gynecologic disease. All subjects receiving analgesic or alternative-therapy were excluded.

2.3.1.2 Intervention and Comparison

Aromatherapy with massage is the common intervention among 5 papers. Aromatherapy with massage to abdomen was delivered by researcher (Apay et al., 2012; Han et al., 2006; Marzouk et al., 2013) or subject own (Kim et al., 2011; Ou et al., 2012). Ten to fifteen minutes massage daily before menstrual period is recommended by all papers except Ou et al. (2012) did not mention duration for massage. Effleurage, a clockwise circular movement, is recommended in two papers (Apay et al., 2012; Han et al., 2006). Kim et al. (2011) provided abdomen massage
technique to subjects and written paper instruction for reviewing the techniques before experiment started whereas Ou et al. (2012) mentioned subjects with lower abdomens massage.

Different composition of essential oils was used among the papers. Common ingredients are lavender oil, rose and clary sage. All papers included lavender oil except Kim et al. (2011), 3 papers included rose (Han et al., 2006; Kim et al., 2011; Marzouk et al., 2013) and 3 papers also included clary sage (Han et al., 2006; Kim et al., 2011; Ou et al., 2012). Lavender oil is reported to be a kind of sedative and effective in alleviating pain, whereas clary sage and rose is reported to be beneficial in menstrual cycle regulation (Tillett & Ames, 2010).

All studies compared intervention with placebo group. They used placebo oil or cream to perform same massage on subjects. Almond oil was used as placebo in 3 papers (Han et al., 2006; Kim et al., 2011; Marzouk et al., 2013). Ou et al. (2012) used synthetic fragrance in jojoba cream as placebo and odorless liquid petrolatum was used by Apay et al. (2012).

Han et al. (2006) and Kim et al. (2011) also included no-treatment control group as the third group for comparison.
2.3.1.3 Outcome Measure

Level of menstrual pain is the common interested primary outcome measure among the 5 papers. Visual analogue scale (VAS) was used among all papers except one paper (Ou et al., 2012). Numeric rating scales (NRS) and verbal rating scale (VRS) were used by Ou et al. (2012). The three pain assessment tools are reliable, valid and widely used (Williamson & Hoggart, 2005).

Apart from menstrual pain level, other secondary outcome measure such as duration of pain (hours) after intervention given was also collected by Marzouk et al. (2013). Besides, severity of dysmenorrhea was measured by verbal multidimensional scoring system in Han et al. (2006).

Reduction of menstrual pain is noted among intervention group in all the 5 papers with statistically significance (p-values < 0.05) reported. At the same time, it is noted that slight reduction of menstrual pain also appeared among placebo group in most of the papers (Apay et al., 2012; Kim et al., 2011; Marzouk et al., 2013; Ou et al., 2012). Marzouk et al. (2013) and Ou et al. (2012) suggested that massage therapy its own also perform as a therapeutic effect towards menstrual pain. Ou et al. (2012) designed its study not to massage at menstruation period. It allows essential oil penetrating into body during non-menstrual period. It can avoid the temporary pain
relief effect from massage during menstruation and minimize the bias from massage therapy. Similar design approach is performed among the other papers (Han et al., 2006; Marzouk et al., 2013). Result showed that there is a greater reduction among the intervention group when comparing to the control group. Intervention group with essential oil is concluded to be more effective when comparing to placebo group. Aromatherapy is effective in relieving menstrual pain.

Overall, the results obtained from the 5 papers are all consistent and showed statistically significance. Four papers concluded that aromatherapy is simple, safe, cost-effective and without side effect (Apay et al., 2012; Han et al., 2006; Kim et al., 2011; Marzouk et al., 2013). Aromatherapy is found to be a contributing non-pharmacological therapy in pain reduction towards dysmenorrhea patients.

2.3.2 Synthesis

Five relevant papers are selected and critically appraised with level of evidence ranged from 1- to 1++. All of them support the use of aromatherapy is effective in reducing pain for dysmenorrhea patients with statistical significant shown. It is shown that the use of aromatherapy in alleviating pain for dysmenorrhea patients is an evidence-based innovation to the dysmenorrhea patients. By extracting and summarizing data from the 5 selected papers, information synthesized can contribute
to this new innovation. Several recommendations are synthesized regarding the use of aromatherapy in alleviating pain for dysmenorrhea patients and shown as below.

Firstly, essential oils are the main part of aromatherapy. Essential oils contain lavender, rose and clary sage are commonly used among the 5 papers and shown to be effective in pain relief. Therefore, ingredient including lavender, rose and clary sage as the therapeutic essential oil is suggested.

Secondly, essential oils can be both absorbed via skin and inhaled. A clockwise circular massage movement with relax abdomen during massage is recommended (Apay et al., 2012; Han et al., 2006).

Concerning the duration, there is no standardized duration for massage among the papers. Ten to fifteen minutes massage daily during the non-menstrual period on lower abdomen is recommended by the researcher which allows time for adsorption via skin.

Besides, aromatherapy can deliver by instructor or patients’ own according to the 5 papers. With written information given to the patients as reference, patients can massage on their own (Kim et al., 2011). However, Kim et al. (2011) pointed out that patients may just self-massage freely by only following the written information sheet, effect may be affected and bias may occur. When translating the information to local
setting, regular follow up and communication is needed to ensure the compliance, standard of aromatherapy and maximize its effect.

Lastly for the outcome measuring tool, three pain rating scales i.e. VAS, NRS and VRS are used among 5 papers. Although three of them are commonly used in clinical practice, NRS and VRS are having fewer difficulties in use. With similar sensitivity, NRS or VRS are recommended to be appropriate in clinical practice (Williamson & Hoggart, 2005). Choice of measuring tools is needed to be considered to ensure a smooth running of guideline in clinical practice.

All in all, aromatherapy in alleviating pain for dysmenorrhea patients is an evidence-based new innovation. By well considering above recommendation for delivering aromatherapy, it is useful for developing a clinical guideline on the use of aromatherapy for dysmenorrhea patients in my local clinical setting. The details of implementation and recommendation will be further discussed in the next chapter.
CHAPTER 3
TRANSLATION AND APPLICATION

A comprehensive critical appraisal on the related literatures was performed in previous chapter. They show evidence supporting the new innovation that the use of aromatherapy is effective in reducing pain for dysmenorrhea patients. The implementation potential of this new innovation should be assessed before it is applied into target clinical practice. (Polit & Beck, 2004)

In this chapter, the transferability and feasibility of aromatherapy will be examined. Besides, the cost-benefit ratio of the innovation will be discussed as well. And finally, an evidence-based practice (EBP) guideline will be developed in order to implement evidence from the identified studies into the real local setting.

3.1 Target Setting and Population

The target setting is one of the gynecology wards of local public hospital in Hong Kong under the Hospital Authority, which provides inpatient service for women who suffer from different gynecological problems. It provides 38 in-patient beds for hospital use. The ward can be divided into 6 parts i.e. nursing station, 4 main cubicles and a small private cubicle. Besides, there are medical examination and consultation room, ultrasound examination room and daily education corner. And patients who are diagnosed with primary dysmenorrhea are the target population.
3.2 Implementation Potential

3.2.1 Transferability

The similarity of setting and population and philosophy of care will be compared among the selected studies and target local setting. Patients to be benefited and timeframe of implementation will also be discussed below, so as to assess the transferability of the proposed innovation.

3.2.1.1 Similarity of Target Setting and Population

Although aromatherapy from the selected studies was mainly conducted in outpatient setting, such as study institutions and outpatient clinic, which is different from the local setting, the basic concept can still be conducted in the local setting. With instruction from instructors, patients continuously perform aromatherapy from time to time and the effect can be evaluated afterwards. The small private cubicle and education corner provide beds and rooms for patients to receive aromatherapy and training. All the participants from the selected studies having same characteristics i.e. 1) with no systemic or gynecologic disease, 2) received no pharmacological therapy during the study period and 3) with pain score ≥ 5, which is similar to the target population.
3.2.1.2 Philosophy of Care

Philosophy of care is the main essence in implementing a potential innovation into local setting. According to the Hospital Authority, target hospital is people-centered with a professional service. Its vision is to provide high quality service, minimize patients’ readmission and allow patients enjoy their best-possible health and quality of life. The aromatherapy provides an alternative way in reducing pain among primary dysmenorrhea patients. It improves patients’ quality of life. In addition, delivering aromatherapy in nursing practice provides a better holistic nursing care for patients as an adjunct to the conventional treatment i.e. pharmacological therapy. By sharing the same value and goal, the innovation can be implemented into target local hospital.

3.2.1.3 Patients to be benefited

A sufficient number of primary dysmenorrhea patients will be benefited under the proposed innovation. Although there is no exact data on primary dysmenorrhea inpatients, estimation can be made based on the daily observation and non-official record on admission bed stat from the target ward. There were around 150 admissions due to dysmenorrhea in the target ward from December 2013 to December 2014. The duration of hospitalization is around 3-5 days. Overall, approximately 150 patients are estimated to be benefited from the proposed innovation in a year.
3.2.1.4 Time for Implementation and Evaluation

The proposed innovation would be divided into three stages which are preparation, implementation and evaluation. Once the innovation is approved, preparation would be started. A working team would be formed at the beginning so as to responsible for this innovation program. It would take one month to prepare aromatic oil from pharmacy and a user-friendly information sheet for patients. Another month would be needed to train the trainer, i.e. advanced practice nurses (APN) and registered nurses (RN), via an international qualified aroma therapist. For implementation, a pilot program would be started and last for 2 months. And it would be followed by an evaluation. Afterwards, amendment would be made based on the evaluation and a full program could be implemented. Annually evaluation would be continued.

To summarize, the population and philosophy of care from the selected studies are consistent to the target hospital. A sufficient number of dysmenorrhea patients can be benefited. A reasonable timeframe of program implementation and evaluation can be achieved. The proposed evidence-based practice is transferable to the target local setting.
3.2.2 Feasibility

Several factors e.g. administrative support, nurses’ autonomy, equipment and facilities will highly influence the feasibility of the innovation.

3.2.2.1 Administrative Support

As mentioned before, the core value of target hospital is providing high quality people-centered service with professional care. People-centered and professionalism is the main consideration. As long as the proposed innovation is evidence-based and significantly beneficial to patient, it is no doubt that the administrative level will support this innovation. A formal presentation to the administrative level will be presented to them for the innovation details.

Moreover, target hospital is recently putting huge effort on research and evidence-based practice. Regular journal club sharing conference is held. Nursing practice under evidence-based is highly recommended. Different evidence-based guidelines or innovation are coming out recently. The supporting and positive climate of evidence-based practice is all around the hospital.

3.2.2.2 Nurses’ Autonomy

Nurses under target hospital are professional and qualified under The Nursing Council of Hong Kong. The proposed innovation, i.e. aromatherapy, is a non-invasive, non-pharmacological therapy in pain reduction. With assessment of the patient health
status, nurses have the autonomy to initiate a non-invasive nursing care for a patient. With the supervision under senior APN, it can be smoothly carried out. Once the proposed innovation is ineffective or undesirable e.g. any side effect or allergy is noted, nurses have the autonomy for termination.

3.2.2.3 Interfere Current Staff Functions

It may be controversial when comparing with the traditional pharmacological therapy. As mentioned before, the traditional pharmacological therapy provides an instant effect in pain relief. Physicians are acting as a dominated role in prescribing medication, whereas nurses are acting as a supportive role.

The proposed innovation – aromatherapy is a non-pharmacological therapy which may not provide immediate effect. Current nursing staff may be doubt with this proposed innovation. A full and detailed presentation about the innovation concept should be provided for current nursing staff and made it clear. To increase confidence towards the new innovation, evidence from the studies with significant result should be presented to the staff. The main concept of aromatherapy as an alternatives treatment for patient should be emphasized. Trained nurses are dominated in aromatherapy. They are providing an evidence-based nursing care for patients. Immediate effect should not be always expected. Instead, a continuous nursing care and therapy is provided to reduce pain in a long run and patient no longer depends on
the pharmacological therapy. Aromatherapy as a non-pharmacological alternative should be emphasized before it is promoted and delivered to patient.

3.2.2.4 Consensus

Consensus among physician, managerial nursing staff and front-line nursing staff, should be reached before the innovation is fully implemented. The aim of patient’s health quality improvement is shared among these three parties. Meetings and discussions about the implementation of innovation can be held among them, so as to share and discuss the concerns and enquiry from different parties.

3.2.2.5 Staff Development

Staff development is one of the major considerations. A trained staff can help to run the aromatherapy program. Cooperation with the Hong Kong Aromatherapy Association is required. For core member of the proposed program, a senior APN and a RN are selected to be trained. They are provided with study days to attend lecture from the Hong Kong Aromatherapy Association. For the reminding staff, talk from the Hong Kong Aromatherapy Association will be held in order to spread the concept of aromatherapy.

3.2.2.6 Equipment and Facilities

Adequate equipment is required to run the innovation. The major component will be aromatic oils. Cooperation with the aromatic oil supplier is needed. An
up-to-standard quality with reasonable price aromatic oils may be chosen and supply to the target hospital. Pharmacy will provide the aromatic oils to the target ward when it is needed.

3.2.2.7 Evaluation Tools

Pain level will be assessed before and after the aromatherapy is applied with the use of NRS. Patient can perform aromatherapy massage on the own after nurses’ instruction. Information sheet about the aromatherapy should be also provided to patient for reference. Monthly telephone follow up will be held and pain level will be assessed via the follow up.

Besides, feedback from staff should not be ignored. Regular meeting with frontline staff will be held, comments regarding workload, patient compliance, staff satisfaction etc. can be collected.

Overall, aromatherapy will be provided to dysmenorrhea patient in the target ward. Trained nurse will deliver aromatherapy massage skill to patient with information sheet provided. Aromatic oils will be also given to patient for massage. Patient can perform aromatherapy on their own after instruction from nurse. Full compliance on aromatherapy is encouraged. Regular follow up and assessment on their pain level will be performed.
3.2.3 Cost-Benefit Ratio

3.2.3.1 Potential Benefits of the proposed innovation

With reference from the selected studies, the proposed innovation will beneficial to dysmenorrhea patient by pain reduction. A continuous treatment in pain reduction will bring a lower chance of readmission to target ward. It will improve patients’ quality of life and re-participation rate to their daily role and activities.

For the nursing staff, the proposed innovation raises nurses to a dominating role. Nurses own the autonomy in initiating the proposed treatment for patients. Job satisfaction will be brought to nurses.

From the managerial level, reduction in patient readmission rate helps with the organization to preserve extra resources e.g. bed for emergence use, general fee for hospitalization. Increasing in frontline staff job satisfaction also helps with preserving manpower within an organization.

3.2.3.2 Potential Risks of the proposed innovation

Despite of the benefits discussed above, the potential risk should not be ignored. Although there is almost no side effect as reported from the selected studies, there is one patient reported with nausea after receiving aromatherapy (Kim et al., 2011). Moreover, allergic reaction towards the aromatic oils may also be one of the undesirable outcomes. In order to minimize the undesirable outcome, health
assessment and history taking should be performed before the treatment started. Also, nurses can terminate the treatment once any undesirable outcome is noted. Physician assessment could be carried out after nurses’ termination.

Besides, there will be potential risk in increasing workload of nursing staff. Nurses are providing extra intervention. Time for staff development, treatment delivery to patient and patient education are required. Nursing staff need to pay extra effort and time in running this new intervention. Stress may be also developed among staff during implementing a new innovation.

3.2.3.3 Potential Risks of maintaining current practice

If the organization keeps maintaining the current practice without implementing a new innovation, potential risk will be developed. Readmission rate due to dysmenorrhea will be maintained or increased. Patient’s quality of life is highly affected. It will lower their participation in daily activities. Apart from their social life, patient’s health status will also be worsen, e.g. liver function and gastric problem, due to side effect from long term medication.

3.2.3.4 Material Costs

If the innovation is implemented, material cost will be mainly focusing on the aromatic oils and information leaflet to patients. The estimated costs for information leaflet is HKD$2 each and aromatic oils is HKD$1,000/one liter, which can be shared
by 50 patients. From previous discussion, around 150 patients will be benefited in a year. The material cost will be around HKD$3,300 for 150 patients in a year, in which 20 ml aromatic oils and an information leaflet are included.

Cost for nursing staff development should be also included. The aromatherapy course with certificate costs HKD$3,800 each person. The core group member, i.e. APN and a RN, of the innovation is required to be trained. The estimated training cost will be HKD$7,600. For the remaining staff, guest from the Hong Kong Aromatherapy Association will be invited for holding talk for them. The administrating fee will be estimated around HKD$500/ talk. Assuming two identical sessions will be arranged for staff, it cost HKD$1,000 for the talks.

The total cost for the 6-month pilot program will be estimated as HKD$10,250. It is shown as table form in appendix F.
3.3 Evidence-Based Guideline

Based on the 5 selected studies as discussed in chapter 2, an evidence-based guideline for dysmenorrhea patient by aromatherapy is developed. It provides information in pain relief by aromatherapy in a clear and user-friendly way as notes in Appendix G.

3.3.1 Title

An evidence-based guideline of aromatherapy in pain relief for dysmenorrhea patient in gynecology ward

3.3.2 Objectives

1) To alleviate pain level of primary dysmenorrhea patient.

2) To guide nurses to perform aromatherapy for the target patients based on the best available evidence.

3) To standardize the application of aromatherapy in a clear and user-friendly way.

3.3.3 Target Population

The target population is patients who admitted to gynecology ward. They are eligible if the following criteria are met.

1) diagnosed with primary dysmenorrhea

2) ADL independent

3) with no cognitive problem
A full physical health assessment should be performed by nurses before aromatherapy is applied.

### 3.3.4 Recommendations

The recommendations are graded based on Scottish Intercollegiate Guidelines Network (SIGN) grading system 1999 – 2012 (Appendix D).

**Recommendation 1**

Assessment of patient’s health and cognitive status should be conducted before the treatment is started.

**Grade of Recommendation: A**

**Available Evidence:**

- Health status and menstruation history were taken before the treatment was started (Apay et al., 2012; Han et al., 2006; Kim et al., 2011; Marzouk et al., 2013; Ou et al., 2012) (1-, 1+, 1-, 1++, 1+).

- Patient who is diagnosed with primary dysmenorrhea with no pregnancy is eligible for the treatment (Ou et al., 2012) (1+).

- Home self-aromatherapy was conducted after the instruction from instructor. (Kim et al., 2011; Ou et al., 2012) (1-, 1+). Patients’ with cognitive will not be able to perform self-aromatherapy at home.
Recommendation 2

The ingredient of therapeutic aromatic oil includes lavender, rose and clary sage.

Grade of Recommendation: A

Available Evidence:

- Lavender was used as an analgesic and anticonvulsant; Rose is effective in alleviating menstrual pain and anxiety; Clary sage was used as anticonvulsant and regulator of menstruation. These three ingredients were commonly used in the 5-reviewed studies (Apay et al., 2012; Han et al., 2006; Kim et al., 2011; Marzouk et al., 2013; Ou et al., 2012) (1-, 1+, 1-, 1++, 1+).

Recommendation 3

A clockwise circular massage movement with relax abdomen during massage.

Grade of Recommendation: A

Available Evidence:

- Abdominal massage with effleurage strokes, working clockwise. Cushion was placed under knee to keep a relax abdomen (Han et al., 2006) (1+).

- Massage on abdomen with clockwise circular movements with participants lying supine and relaxed abdomen (Apay et al., 2012) (1-).
Recommendation 4

Ten to fifteen minutes massage daily on lower abdomen.

Grade of Recommendation: A

Available Evidence:

- Ten to fifteen minutes massage was applied (Apay et al., 2012; Han et al., 2006; Kim et al., 2011; Marzouk et al., 2013) (1-, 1+, 1-, 1++). It allows time for the absorption of aromatic oil via skin.

Recommendation 5

Aromatherapy can be delivered by nurses or patients’ own.

Grade of Recommendation: A

Available Evidence:

- Aromatherapy was delivered by instructor in three reviewed studies (Apay et al., 2012; Han et al., 2006; Marzouk et al., 2013) (1-, 1+, 1++), whereas it was delivered by patients’ own in the other two reviewed studies (Kim et al., 2011; Ou et al., 2012) (1-, 1+).
Recommendation 6

Written information about aromatherapy will be given to patient as reference.

Grade of Recommendation: B

Available Evidence:

- Written instruction papers were provided for techniques review (Kim et al., 2011) (1-).

Recommendation 7

Side effects such as nausea should be monitor for patient after the treatment is delivered.

Grade of Recommendation: B

Available Evidence:

- Although most of the patients reported with no side effect were noted, nausea was reported by some patient (Kim et al., 2011) (1-).
CHAPTER 4

IMPLEMENTATION PLAN

After assessment of the implementation potential in the previous chapters, the plans for implementation should be considered. In order to reach a successful implementation of the innovation, implementation plan including communication plan and pilot test will be discussed below.

4.1 Communication Plan

An effective communication among stakeholders mainly determines the success of the proposed innovation as they are the key person involving in. It provides a channel for each stakeholder to familiarize with the proposed innovation. With a comprehensive proposal, approval and support from the stakeholder can be obtained.

4.1.1 Stakeholder

The stakeholder in the proposed aromatherapy program mainly divided in to two levels. They are managerial and operational level and will be defined as below.

Managerial Level

At this level, the Chief of Service (COS), Departmental Operational Manager (DOM) and Ward Manager (WM) from the selected gynecology ward in a public
hospital are the key persons, who involve in final decision making for resources and manpower allocation. The proposed innovation will not be able to carry out without their approval and support. A comprehensive proposal including cost and benefits including reduction in readmission rate should be presented to them, so as to grasp their agreement on the proposed innovation. Sufficient manpower and resources can be obtained from them.

**Operational Level**

The frontline staffs from the selected gynecology ward, including APN, RN, Health Care Assistants (HCA) and Physician are the key persons at this level since the proposed innovation will be carried out in this ward.

At first, nurses are involving in the main role. They are the main users of the guideline. They are responsible for recruiting the eligible patients, conducting basic assessment for patients, performing aromatherapy massage on patients during hospitalization and educating patients with self-aromatherapy after they are discharged. They also have the autonomy for therapy termination once any undesirable side effect or allergy is noted. For HCAs, they are acting supporting role for nurses e.g. setting up the clinical area, materials preparation etc. Thus, a full
explanation of the guideline to both nurses and HCAs is necessary in order to obtain a smooth and ideal program implementation.

On the other hand, physicians are acting an important role for the innovation. They traditionally prescribe medication which provides an instant effect in pain relief for patients. Aromatherapy as secondary non-pharmacological therapy is a new concept to them. A detailed presentation about the innovation should be introduced to physician in order to gain their trust and support. Thus, they can prescribe aromatherapy for patients.

Last but not least, the patients who are receiving the innovation should not be overlooked. They are the receiver of the therapy. Their acceptance and compliance would mainly determine the success of the innovation. Their concerns should be considered as well.

4.1.2. Communication Progress

A communication working team will be formed before the communication progress started. The working team comprises of four core members from the gynecology ward: an APN as the leader and three RNs as the facilitators. Among the team members, the APN and one RN will be appointed to attend the aromatherapy course with certificate as mentioned in Chapter 3. The team is responsible for
preparation, staff training, execution and evaluation throughout the whole program. It also helps to coordinate and facilitate the communication between different stakeholders effectively.

The communication progress is divided into three phrases: initiation phrase, guiding phrase and sustaining phrase.

**Initiation Phrase**

It begins with communication at the managerial level, the WM from the selected gynecology ward. A brief introduction of the aromatherapy and its’ indication, evidence, cost and benefit will be presented to WM and DOM by the APN from the communication team via meeting. As the leaders of the department, WM and DOM own the authority to approve any new practice or innovation in the clinical setting. Approval from WM should be obtained at the beginning before anything is started. With the ample experience by WM and APN, feasibility of the aromatherapy in the clinical setting will be reviewed.

Once the approval is obtained from WM, a formal meeting will be held with different stakeholders from gynecology department including COS, DOM, WM, APNs, and the representatives from physicians’ side. Power Point slides will be presented to them by the RNs from the communication team. Comprehensive
presentation i.e. the significance and current practice of pain relief, the benefit of aromatherapy with evidence-based support, the content and budget of proposed aromatherapy guideline will be clearly elaborated during the formal meeting. Different concerns and feedbacks from the stakeholders are welcomed and discussed during the meeting or via email after the meeting. Amendments are allowed after obtaining the valuable suggestions and recommendations from the stakeholders.

**Guiding Phrase**

With the amended proposed guideline after one-month discussion within managerial level, the next step is to guide changes at frontline staff.

To raise the awareness of the frontline staff, an introduction meeting about one hour will be held with the frontline nurses and physicians. Two-identical sessions will be available for them. An introduction about aromatherapy, significance of aromatherapy, elaboration of the findings from the selected journal and the proposed guideline will be presented by power point slide. Written information with photo guide will be provided to the participants. Q&A session will be available to resolve the concerns from them. To maximize the participating rate, promotion of the introduction meeting will be launched via email and poster.
Besides, HCA should not be ignored as they are the helpful assistants for nurses in clinical practice. A Chinese version of aromatherapy talk around 30 minutes will be arranged to them by RN from the communication team. A flowchart with photo guided will be posted on the notice board for HCA. So, they can briefly understand the workflow.

Lastly, poster will be posted on patient comer board so as to raise the awareness from the patients and promote aromatherapy. Nurses will also have face-to-face promotion to dysmenorrhea patients with leaflet given, prepared by the communication working team, during their hospitalization.

For staff development, an APN and a RN from the working team are appointed to be trained by lecturers from the Hong Kong Aromatherapy Association as mentioned in Chapter 3. They are internationally recognized and certificated after training from the Hong Kong Aromatherapy Association. The appointed aromatherapy-trained APN and RN are responsible for demonstrating the technique of aromatherapy for each nurse from gynecology ward. Each gynecology nurse will learn the basic technique of aromatherapy and main point of the guideline. They will be assessed by the appointed APN and RN, so that their quality of aromatherapy can be ensured.
**Sustaining Phrase**

To sustain the changes, communication between different parties is important. Continuous comments and feedbacks are collected from the stakeholders via email, questionnaire and observation. Members from the communication team will visit different parties and collect comments from them bi-weekly before implementation. Besides, regularly updates of the progress will be informed to WM via email bi-weekly. Amendments on the guideline will be made from time to time based on the recommendation from the stakeholders. And it will be announced to frontline staff by email and poster posted on the notice board.

**4.2 Pilot Test**

In order to determine the logistics and feasibility of the proposed guideline, a pilot test will be conducted before a full-scale program is implemented.

**4.2.1 Objectives**

1) To assess the feasibility and logistics of the proposed guideline

2) To assess the user compliance of the guideline

3) To evaluate the patient’s acceptance towards the proposed guideline
4.2.2 Duration and Setting

A pilot test, which will last for around two months, will be held in a gynecology ward for dysmenorrhea inpatient

4.2.3 Target Population

Trained nurses from the selected gynecology ward will be responsible for this pilot test, including enrollment of the eligible patients, aromatherapy delivery, patient education, patients’ pain assessment and termination of therapy. The communication working team will act as the facilitator throughout the pilot test. Nurses can seek help and opinions from the communication working team if they wish. The whole pilot test will base on the proposed guideline. Evaluation will be conducted at the end of the pilot test before implementing the full-scale program.

Patients to be enrolled will be having same criteria as mentioned in chapter 4. They are ADL independent patients who are diagnosed with primary dysmenorrhea and free of cognitive problem.

The detail of proposed guideline is shown in Appendix G.
Evaluation is made to determine if the objectives of pilot test are achieved or not, i.e. the feasibility and logistics of the proposed guideline, user compliance of the guideline and patient’s acceptance.

To evaluate the feasibility and logistics of the program, questionnaires and interview meeting will be arranged at the end of the pilot test. Nurses and allied health staff can express the difficulties and problem they met in the questionnaires as shown in Appendix H. Suggestions are also welcomed. Feedbacks and comments collected will be raised and discussed during the interview by the communication working team.

To assess the user compliance of the guideline, observation by working team members will be made. Potential factors leading to non-compliance with guideline e.g. increased workload and unclear guideline instruction should be minimized as well.

Besides, collecting opinions from the patients is also necessary. Questionnaires with opened-ended question and scoring for the program can show the patients’ acceptance and satisfactory level towards the program. It is illustrated in Appendix I.
By collecting different suggestion and ideas from the pilot test, a full-scale program is ready to be implemented. The estimated timeframe of the whole implementation plan is shown in Appendix J.

4.3 Evaluation Plan

An evaluation plan is an important part for the proposed innovation. The evaluation plan details will be discussed below.

4.3.1 Identifying Outcomes

4.3.1.1 Patient Outcome

The aim of the guideline is to alleviate pain level of primary dysmenorrhea patient. A reduction in pain level is expected as the primary patient outcome for the program. The pain level will be directly reflected by the NRS, which is a reliable, valid and widely used pain assessment tool (Williamson & Hoggart, 2005). NRS is divided into 11 categories from 0 to 10, which representing no pain to extreme pain. By patients’ self-reporting, nurses can compare the pain score difference between pre and post treatment. Result can be drawn and summarized and reflect the effectiveness of the program.

Besides, patients’ satisfactory level towards the program will be also assessed. Questionnaires will be distributed to patients for collecting feedback from them.
Feedback can be also collected directly via the monthly telephone follow up by nurses. Random-selected patients will be interviewed by nurses for sharing their experience and comments.

4.3.1.2 Health Care Provider Outcome

Health care provider outcome includes an increase in knowledge and confidence level in implementing the proposed guideline. Skills of aromatherapy massage will be directly assessed by the certified aromatherapy-trained APN or RN regularly to ensure the quality of treatment provided.

Besides, satisfactory level among health care providers should be also assessed as they are important in implementing the program. To measure it, evaluation questionnaire will be completed by them.

4.3.1.3 Organization Outcome

An effective program will be welcomed by the department. Minimum expenditure is expected from the organization view. Also, a reduction of readmission rate and full utilization of the innovation is the other expected outcomes.
4.3.2 Characteristic and Number of Patients involved

The characteristic of eligible patients in evaluation is identical to the target population. They are ADL independent patients, who are diagnosed with primary dysmenorrhea and with no cognitive problem.

To determine the number of eligible patients to be involved for evaluation, an online sample size calculator (Lenth, 2006-9) is used. For this program, pain level as the primary outcome and two-tailed paired t-test is used. With reference from the 5 selected studies (Apay et al., 2012; Han et al., 2006; Kim et al., 2011; Marzouk et al., 2013; Ou et al., 2012), the mean reduction in NRS is estimated at 2.9. The level of significant and power is also based on the 5 selected studies, which is 0.05 and 0.8 respectively. The number of patients to be involved should be at least 14. In addition, drop out is unavoidable. Thus, dropout rate should be taken into consideration. Dropout rate is reported from 0 to 12.7% among the 5 selected studies. In conservatively speaking, around 13% of dropout rate is estimated. Overall, at least 20 eligible patients should be recruited after calculation.
4.3.3 Data Collection

For the primary patient outcome, i.e. pain level, pre-treatment NRS will be collected from each recruited patient as the baseline data during the initial assessment by nurses. Then, daily aromatherapy massage will be applied during hospitalization by nurses or by patients’ themselves after discharged with training provided. Post-treatment NRS will be reported by patient via the monthly telephone follow up by nurses. Difference between pre and post-treatment NRS can be measured.

For patients’ satisfactory level, evaluation questionnaires will be filled in by patients upon discharge. Feedback will be collected by nurses via the monthly telephone follow up.

Data collection for the recruited patients will be conducted continuously throughout the implementation period of the full-scale program, which lasts for six months.

Besides, staff satisfactory level towards the program will be measured by evaluation questionnaires. Evaluation questionnaires will be completed by staff, including nurses and allied health staff, at the end of the second month and end of the program.
4.3.4 Data Analysis

To analyze the collected data, Statistical Package for Social Sciences (SPSS) version 20 is used. Descriptive statistics i.e. patients’ demographic data, NRS will be expressed in mean and standard deviation. Two-tailed paired t-test is used for statistically analyzing the mean pain level of the recruited patients. By measuring the percentage of the response from the patient and staff evaluation questionnaires, the satisfactory level will be calculated out.

4.3.5 Criteria for Determining Guideline Effectiveness

It is considered as an effective program if all the outcomes are achieved as discussed below.

4.3.5.1 Patient Outcome

Reduction of pain level is the major patient outcome of the program. From the 5 selected studies, there is a reduction of mean NRS by 2 or more after receiving aromatherapy. Taking it as a reference to the local setting, the proposed program can be regarded as effective when 80% patients report 2 points or more reduction in NRS after the therapy is applied.
4.3.5.2 Patient and Staff Satisfactory Level

When patient and staff are satisfied with the program, patients’ attitudes and staff moral will be improved. A better working environment will be achieved as well. Their satisfactory level towards the program is evaluated by the questionnaires. A positive response is noted when “Strongly Agree” or “Agree” is ticked by the responder. When 70% or more of positive response is received, the program will be considered as effective.

4.3.5.3 Staff Knowledge

Skills of aromatherapy massage are assessed by the certificated aromatherapy-trained APN or RN as mentioned. Once they pass the assessment, they feel confident to promote this new innovation. The quality of therapy provided can be also ensured. Thus, staff training will be effective if 90% of nursing staff pass the aromatherapy massage skill assessment. The details of audit form are shown in Appendix K.

4.3.5.4 Cost

With limited funding and budget, financial cost of the program should be well considered. When the total expenditure of the 6-month program is within the
estimated cost i.e. HKD$10250 as shown in Appendix F, it will be acceptable and effective from the managerial point of view.

Overall, with the comments and information from evaluation, further modification of the innovation guideline can be made for a better outcome in long term. A formal reporting will be made by the working team members. A brief presentation will be held by the team members conclude the overall program. Different stakeholders as mentioned are welcomed.

To summarize, dysmenorrhea is typical gynecology problem for women. The negative impacts on dysmenorrhea patient include physical health, psychological health and their daily life activities. Several non-pharmacological therapies are available for managing dysmenorrhea e.g. aromatherapy was suggested by different studies. For a better clinical nursing practice, an evidence based guideline of aromatherapy in pain relief for dysmenorrhea patients was suggested.

To formulating this new innovation, a systematic review for relevant studies, critical appraisal on them and summary were performed as the foundation of this guideline. Besides, the implementation potentials including transferability, feasibility, cost and benefit was discussed and compared with the target ward. Based on the findings, recommendations of the guideline were suggested. To implementing it, a detailed implementation plan including communication with different stakeholders,
pilot study plan and evaluation plan were discussed.

Overall, aromatherapy was suggested to be effective and beneficial to the dysmenorrhea patients. It is transferable and feasible to be carried out in the target ward. This evidence based translational study is recommended to be considered as a new pain relief innovation for dysmenorrhea patients.
### Appendix A: Database Search Strategy and Results (Prisma Flow Diagram)

<table>
<thead>
<tr>
<th>Search items</th>
<th>MEDLINE</th>
<th>PubMed</th>
<th>CINAHL Plus</th>
<th>The Cochrane Library</th>
<th>British Nursing Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>aromatherapy</td>
<td>858</td>
<td>858</td>
<td>1730</td>
<td>209</td>
<td>233</td>
</tr>
<tr>
<td>aromatic</td>
<td>73,645</td>
<td>73648</td>
<td>938</td>
<td>236</td>
<td>6</td>
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<td>aroma</td>
<td>3512</td>
<td>3492</td>
<td>136</td>
<td>69</td>
<td>11</td>
</tr>
<tr>
<td>essential oil</td>
<td>6066</td>
<td>14632</td>
<td>709</td>
<td>550</td>
<td>56</td>
</tr>
<tr>
<td>dysmenorrhea</td>
<td>4795</td>
<td>5278</td>
<td>1048</td>
<td>815</td>
<td>46</td>
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<td>menstrual pain</td>
<td>928</td>
<td>6813</td>
<td>232</td>
<td>543</td>
<td>50</td>
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<td>menstrual cramp</td>
<td>7</td>
<td>4811</td>
<td>1</td>
<td>51</td>
<td>3</td>
</tr>
<tr>
<td>(1) OR (2) OR (3) OR (4)</td>
<td>83040</td>
<td>91027</td>
<td>3266</td>
<td>943</td>
<td>259</td>
</tr>
<tr>
<td>(5) OR (6) OR (7)</td>
<td>5372</td>
<td>7240</td>
<td>1164</td>
<td>1140</td>
<td>69</td>
</tr>
<tr>
<td>(8) AND (9)</td>
<td>15</td>
<td>23</td>
<td>23</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>After reading title and abstract</td>
<td>7</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Full text available</td>
<td>2</td>
<td>8</td>
<td>2</td>
<td>6</td>
<td>1</td>
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<tr>
<td>Selected literatures after elimination according to the inclusion and exclusion criteria</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>1</td>
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<tr>
<td>Subtotal selected literatures after elimination of the duplicated</td>
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<td></td>
<td></td>
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<tr>
<td>Manual Search from references of selected literatures</td>
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<tr>
<td>Total literatures</td>
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<td>5</td>
</tr>
</tbody>
</table>

Searching Period: From May 2014 to Sep 2014
Appendix B: Bibliographic citation of selected studies


<table>
<thead>
<tr>
<th>Bibliographic Citation</th>
<th>Study Type</th>
<th>Patient Characteristics</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Length of Follow Up</th>
<th>Outcome Measure</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Han et al., 2006</td>
<td>RCT with 3 arms (1+)</td>
<td>College women Median age: 20-21 With pain of menstrual cramps &gt; 6 points on VAS No significant differences among two groups</td>
<td>Aromatherapy: 15-minute abdominal massage using lavender, clary sage and rose in 5 cc of almond oil (n=25)</td>
<td>Placebo group: 15-minute abdominal massage with almond oil only (n=20) control group: No treatment. (n=22)</td>
<td>On the 1st and 2nd days of menstruation after the experimental treatment</td>
<td>(1) Visual Analog Scale of Pain (VAS) (2) Verbal Multidimensional Scoring System</td>
<td>(1) Aromatherapy Group: 1st day: 5.0 2nd day: 3.0 (p&lt; 0.01) Placebo Group: 1st day: 7.0 2nd day: 7.0 (p&lt;0.05) Control Group: 1st day: 7.0 2nd day: 7.0 (p=N/A) (2) 1st Day change in severity Aromatherapy Group: $\beta =0.31$, 95% CI: 0.05 to 0.57, p=0.02 Placebo Group: $\beta = -0.003$, 95% CI: -0.29 to 0.28, p=0.98 2nd Day change in severity Aromatherapy Group: $\beta =0.33$, 95% CI: 0.10 to 0.56, p=0.006 Placebo Group: $\beta = -0.15$, 95% CI: -0.40 to 0.10, p=0.23</td>
</tr>
<tr>
<td>Bibliographic Citation</td>
<td>Study Type</td>
<td>Patient Characteristics</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Length of Follow Up</td>
<td>Outcome Measure</td>
<td>Result</td>
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<tr>
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</tr>
<tr>
<td>2) Marzouk et al., 2013</td>
<td>RCT of crossover design (1++)</td>
<td>Nursing students</td>
<td>1st treatment phase: Aromatherapy (group 1): 10-minute abdominal massage once daily for seven days prior to menstruation using the essential oils: cinnamon, clove, rose and lavender in almond oil (n=48)</td>
<td>1st treatment phase: Placebo (group 2): same abdominal massage with almond oil (n=47)</td>
<td>October 2010 - January 2011 (3 months)</td>
<td>(1) Visual analogue scale (VAS)</td>
<td>1st treatment phase: (1) Aromatherapy: 1st day: 5.8 +/-2.1 (p=0.013) 2nd day: 4.3 +/-2 (p=0.01) 3rd day: 2.7 +/-2 (p=0.006) Placebo: 1st day: 6.8 +/-1.7 (p=0.013) 2nd day: 5.4 +/-1.9 (p=0.01) 3rd day: 3.8 +/-1.9 (p=0.006) (2) Aromatherapy: 18.6 +/-8.8 Placebo: 23.1 +/-8.9 (p=0.018)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medical students</td>
<td>2nd treatment phase: Switch intervention among 2 groups</td>
<td>2nd treatment phase: Switch intervention among 2 groups</td>
<td></td>
<td>(2) Duration of pain (hours)</td>
<td>2nd treatment phase: (1) Aromatherapy: 1st day: 5.7 +/-2 (p=0.011) 2nd day: 4.4 +/-2 (p=0.009) 3rd day: 2.6 +/-2 (p=0.002) Placebo: 1st day: 6.8 +/-1.9 (p=0.011) 2nd day: 5.5 +/-2.1 (p=0.009) 3rd day: 4.1 +/-2.6 (p=0.002) (2) Aromatherapy: 19.3 +/-9.6 Placebo: 24.5 +/-8.89 (p=0.007)</td>
</tr>
<tr>
<td>Bibliographic Citation</td>
<td>Study Type</td>
<td>Patient Characteristics</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Length of Follow Up</td>
<td>Outcome Measure</td>
<td>Result</td>
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<tr>
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</tr>
<tr>
<td>3) Ou et al., 2011 Pain relief assessment by aromatic essential oil massage on outpatients with primary dysmenorrhea: A randomized, double-blind clinical trial</td>
<td>RCT with 2 arms (1+)</td>
<td>Outpatient Mean age: 24.5 ≥ 5 scores evaluated by NRS diagnosed with Primary Dysmenorrhea by a gynecologist No significant differences among two groups</td>
<td>Essential oil Group (EOG) Lavender, clay sage and marjoram oils in unscented jojoba cream two 1-g spoonfuls each day by abdominal massage until the next menstrual cycle (n=24)</td>
<td>Synthetic Fragrance Group (SFG) Synthetic fragrance in jojoba cream two 1-g spoonfuls each day by abdominal massage until the next menstrual cycle (n=24)</td>
<td>September 2009 to March 2010 (6 months)</td>
<td>(1) 10-point numeric rating scales (NRS) (2) verbal rating scale (VRS)</td>
<td>(1) EOG: 1&lt;sup&gt;st&lt;/sup&gt; day: -2.92 (p&lt;0.001) 2&lt;sup&gt;nd&lt;/sup&gt; day: -2.21 (P&lt;0.001) 3&lt;sup&gt;rd&lt;/sup&gt; day: -1.38 (P&lt;0.05) SFG: 1&lt;sup&gt;st&lt;/sup&gt; day: -1.96 (p&lt;0.001) 2&lt;sup&gt;nd&lt;/sup&gt; day: -1.62 (P&lt;0.001) 3&lt;sup&gt;rd&lt;/sup&gt; day: -0.96 (NS) (2) EOG: 1&lt;sup&gt;st&lt;/sup&gt; day: -1.08 (p&lt;0.001) 2&lt;sup&gt;nd&lt;/sup&gt; day: -0.96 (P&lt;0.001) 3&lt;sup&gt;rd&lt;/sup&gt; day: -0.63 (P&lt;0.05) SFG: 1&lt;sup&gt;st&lt;/sup&gt; day: -1.00 (p&lt;0.001) 2&lt;sup&gt;nd&lt;/sup&gt; day: -0.50 (P&lt;0.05) 3&lt;sup&gt;rd&lt;/sup&gt; day: -0.58 (p&lt;0.05)</td>
</tr>
<tr>
<td>Bibliographic Citation</td>
<td>Study Type</td>
<td>Patient Characteristics</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Length of Follow Up</td>
<td>Outcome Measure</td>
<td>Result</td>
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</tr>
<tr>
<td>4) Kim et al., 2011</td>
<td>Controlled Trial with 3 arms (1-)</td>
<td>Nurses</td>
<td>Aromatherapy Group: 10 min Self-aromatherapy massage with abdomen massage by essential oils from rose absolute, rose otto, clary sage, rose nium and ginger in almond oil, jojoba oil and evening primrose oil (n=26)</td>
<td>Placebo group 10 min Almond oil with abdomen massage (n=18)</td>
<td>24 h after the massage</td>
<td>(1) Visual analogue scale (VAS).</td>
<td>Aromatherapy: −3.7 (p&lt;0.001)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean age: 24.9-25</td>
<td></td>
<td>No-treatment control group (n=19).</td>
<td></td>
<td></td>
<td>Placebo: −1.5 (p&lt;0.001)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Menstrual pain &gt;5 on VAS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Control: −2.2 (p&lt;0.001)</td>
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<tr>
<td></td>
<td></td>
<td>No significant differences among two groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Effect size Aromatherapy vs placebo: 1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Aromatherapy vs control: 1.12</td>
</tr>
<tr>
<td>Bibliographic Citation</td>
<td>Study Type</td>
<td>Patient Characteristics</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Length of Follow Up</td>
<td>Outcome Measure</td>
<td>Result</td>
</tr>
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</tr>
<tr>
<td>5) Apay et al., 2010</td>
<td>Quasi-experimental design with subject as their own control (1-)</td>
<td>Midwifery and nursing students Mean age: 20.31 With VAS scores were &gt;60mm out of 100mm No significant differences among two groups (subject as their own control)</td>
<td>15 minutes Aromatherapy massage on abdomen with lavender oil (n=44)</td>
<td>Placebo massage with odorless liquid petrolatum (soft paraffin) (n=44)</td>
<td>3 menstrual period</td>
<td>(1) Visual Analog Scale of Pain (VAS)</td>
<td>Post-intervention – Pre-intervention Aromatherapy Group: -31.25 (p&lt;0.001) Placebo Group: -8.07 (p&lt;0.001)</td>
</tr>
</tbody>
</table>
Appendix D: SIGN grading system 1999 – 2012

LEVELS OF EVIDENCE

1++  High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias
1+   Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias
1-   Meta-analyses, systematic reviews, or RCTs with a high risk of bias
2++  High quality systematic reviews of case control or cohort or studies
     High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal
2+   Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal
2-   Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal
3    Non-analytic studies, e.g. case reports, case series
4    Expert opinion

GRADES OF RECOMMENDATIONS

A At least one meta-analysis, systematic review, or RCT rated as 1++, and directly applicable to the target population; or
   A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results

B A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or
   Extrapolated evidence from studies rated as 1++ or 1+

C A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or
   Extrapolated evidence from studies rated as 2++

D Evidence level 3 or 4; or
   Extrapolated evidence from studies rated as 2+
<table>
<thead>
<tr>
<th>Question</th>
<th>Bibliographic Citation</th>
<th>1) Han et al., 2006 RCT</th>
<th>2) Marzouk et al., 2013 RCT</th>
<th>3) Ou et al., 2011 RCT</th>
<th>4) Kim et al., 2011 Quasi-experimental design</th>
<th>5) Apay et al., 2010 Quasi-experimental design</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1) The study addresses an appropriate and clearly focused question.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>1.2) The assignment of subjects to treatment groups is randomized.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>1.3) An adequate concealment method is used.</td>
<td>No</td>
<td>Yes</td>
<td>Can’t say</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
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<tr>
<td>1.4) Subjects and investigators are kept ‘blind’ about treatment allocation.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Not applicable</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>1.5) The treatment and control groups are similar at the start of the trial.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>1.6) The only difference between groups is the treatment under investigation.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>Yes</td>
<td>Visual analogue scale (VAS), verbal multidimensional scoring system</td>
<td>Yes</td>
<td>Visual analogue scale (VAS) and duration of pain (hours)</td>
<td>Yes</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------------------------</td>
<td>-----</td>
<td>---------------------------------------------------------------------</td>
<td>-----</td>
<td>---------------------------------------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>1.8</td>
<td>What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
<td>No drop out was reported.</td>
<td>No drop out was reported.</td>
<td>No drop out was reported.</td>
<td>No drop out was reported.</td>
<td>No drop out was reported.</td>
</tr>
<tr>
<td>1.9</td>
<td>All the subjects are analyzed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>1.10</td>
<td>Where the study is carried out at more than one site, results are comparable for all sites.</td>
<td>At one site only.</td>
<td>At one site only.</td>
<td>At one site only.</td>
<td>At one site only</td>
<td>At one site only</td>
</tr>
<tr>
<td>2.1</td>
<td>How well was the study done to minimize bias?</td>
<td>Acceptable</td>
<td>High quality</td>
<td>Acceptable</td>
<td>Acceptable</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Question</td>
<td>Yes 1+</td>
<td>Yes 1++</td>
<td>Yes 1+</td>
<td>Yes 1-</td>
<td>Yes 1-</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
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<td></td>
</tr>
<tr>
<td>2.2) Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?</td>
<td>P value is reported with significant difference noted.</td>
<td>P value and CI are reported with significant difference noted.</td>
<td>P value is reported with significant difference noted.</td>
<td>P value is reported with significant difference noted.</td>
<td>P value is reported with significant difference noted.</td>
<td></td>
</tr>
<tr>
<td>2.3) Are the results of this study directly applicable to the patient group targeted by this guideline?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>2.4) Summarize the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.</td>
<td>Concealment and blinding to researcher is inadequate.</td>
<td>Adequate concealment and blinding with randomization. Well methodology design.</td>
<td>Adequate randomization with double blinded approach. Concealment didn’t mention.</td>
<td>Non-randomized and non-blinded may increase bias. Right approach in a quasi-experimental design.</td>
<td>Non-randomized and non-blinded may increase bias. Right approach in a quasi-experimental design.</td>
<td></td>
</tr>
<tr>
<td>Level of evidence</td>
<td>1+</td>
<td>1++</td>
<td>1+</td>
<td>1-</td>
<td>1-</td>
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</table>
Appendix F: Estimated cost of implementing the 6-month pilot program

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
<th>Sub total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material cost:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) Information leaflet</td>
<td>HKD$2 each</td>
<td>HKD$2 x 150 = HKD$300 (for 150 patients a year)</td>
</tr>
<tr>
<td>2) Aromatic oils</td>
<td>HKD$1000 per liter</td>
<td>HKD$1000 x 3 = HKD$3000 (for 150 patients a year)</td>
</tr>
<tr>
<td><strong>Training cost:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) Aromatherapy course</td>
<td>HKD$ 3800 each</td>
<td>HKD$3800 x 2 = HKD$7600</td>
</tr>
<tr>
<td>2) Administering fee for talk</td>
<td>HKD$ 500 each</td>
<td>HKD$500 x 2 = HKD$1000</td>
</tr>
<tr>
<td><strong>Total cost for the 6-month pilot program:</strong></td>
<td></td>
<td>300/2 + 3000/2 + 7600 +1000 = <strong>HKD$ 10250</strong></td>
</tr>
</tbody>
</table>

*Assumption: There are 150 target patients in a year.*
Appendix G:

Evidence based guideline of aromatherapy in pain relief for dysmenorrhea patient in gynecology ward

Patient who are eligible:
1) diagnosed with primary dysmenorrhea
2) ADL independent
3) With no cognitive problem

Health assessment and baseline pain level conducted by nurse

Written consent obtained after explanation by nurse

Pre-aromatherapy education to patient

10-15 minutes clockwise circular massage applied on relax abdomen with therapeutic aromatic oils daily

Monitor for any side effect

Inpatient

Continue with aromatherapy during hospitalization by nurse

Discharged

Written instruction paper for patients

Patient continue with self-aromatherapy at home

Monthly follow up by telephone for
1) Pain level
2) Compliance
3) Side effect
4) Feedback

Termination by nurse is applicable at any phase
Appendix H: Staff Evaluation Questionnaire

Rank: ___________________  Date: ________________

Part 1: Please tick the appropriate box that can mostly represent your feelings.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The guideline instruction is clear.</td>
<td></td>
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</tr>
<tr>
<td>The guideline is user-friendly.</td>
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</tr>
<tr>
<td>I gain knowledge about aromatherapy massage after training.</td>
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<tr>
<td>I know how to perform aromatherapy massage after training.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident to perform aromatherapy massage after training.</td>
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<td>The workload is acceptable after implementing the guideline</td>
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<td>I have enough support from the communication working team.</td>
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<tr>
<td>Overall, I feel satisfactory about the new guideline program.</td>
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</table>
Part 2:

Please answer the questions below.

1. Are there any difficulties on patient recruitment? Please state below.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

2. Are there any difficulties on therapy implementation? Please state below.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

3. Are there any suggestions or comments for the program? Please state below.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Thank you for your valuable comments.

End
**Appendix I: Patient Evaluation Questionnaire**

Date:________________________

**Part 1:** Please tick the appropriate box that can mostly represent your feelings.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</thead>
<tbody>
<tr>
<td>The guideline instruction is clear.</td>
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<tr>
<td>I gain knowledge about aromatherapy massage after nurses’ introduction.</td>
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<tr>
<td>I know how to perform aromatherapy massage after nurses’ introduction.</td>
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<td>I am confident to perform aromatherapy massage by myself after nurses’ introduction.</td>
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<td>I have enough support from nurses when I needed</td>
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<td>I feel less pain after aromatherapy massage is performed.</td>
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<td>Aromatherapy massage is effective.</td>
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<td>I will continue aromatherapy massage in the coming 6 months.</td>
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<td>Overall, I feel satisfactory about the program.</td>
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</table>
Part 2:

Please answer the questions below.

1. Are there any difficulties on performing aromatherapy? Please state below.

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2. Are there any discomforts after the therapy is applied? Please state below.

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3. Are there any suggestions or comments for the program? Please state below.

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Thank you for your valuable comments.

End
## Appendix J: The Estimated Timeframe of Implementation Plan

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Appendix K: Staff Audit Form on Aromatherapy Massage

Name:_________________________ Date:_________________________

Please tick the appropriate box.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Assessment of patient’s health and cognitive status.</td>
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<tr>
<td>States eligible criteria for aromatherapy correctly.</td>
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<tr>
<td>Verbal consent is obtained.</td>
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<tr>
<td>Aromatic oils is applied on lower abdomen</td>
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<tr>
<td>Clockwise circular massage movement is applied on lower abdomen.</td>
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<tr>
<td>Ten to fifteen minutes massage is applied.</td>
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<td>Side effects can be raised. (e.g. nausea, allergy etc)</td>
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<td>Appropriate documentation.</td>
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</table>
Reference


