'Making sense of scents'

Aromatherapy in Academic Hospice Demeter: A Study into the Feasibility and Benefits

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ABSTRACT

'Making sense of scents', Aromatherapy in Academic Hospice Demeter: A Study into the Feasibility and Benefits

Background. Because conventional care provides insufficient relief, patients near the end of life reach out to interventions like aromatherapy increasingly more. Aromatherapy has shown positive effects in this population on psychological symptoms, anxiety, depression and quality of life. In the Netherlands, however, the application of aromatherapy in hospices is limited.

Aim and research questions. Exploring the feasibility and benefits of aromatherapy in a hospice setting.
Primary research question: What is the feasibility of delivering aromatherapy to hospice patients as experienced by hospice nurses and care volunteers?
Secondary research question: What are the possible benefits of aromatherapy on anxiety, depressed mood, restlessness and quality of life in hospice patients?

Method. Feasibility was assessed with a questionnaire which was distributed among 62 care providers. The benefits of aromatherapy were explored by a patient case study and USD (Utrecht Symptom Diary) scores.

Results. Of the 62 eligible care providers 39 responded, showing a response rate of 73.3% for the nurses and 59.6% for the care volunteers. Results showed a positive attitude of care providers towards aromatherapy but also contradicting statements. Furthermore, care volunteers were significantly less positive about practical aspects. USD scores did not indicate any benefit of aromatherapy, day to day reporting did.

Conclusion. All care providers have a positive attitude towards aromatherapy but nurses experience an increase in workload and care providers experience educational and practical problems. Benefits of aromatherapy on anxiety, depressed mood, restlessness and quality of life were not measured but care providers did observe and report positive effects.

Recommendations. Future research is needed to explore the contradicting statements of care providers and provide more substantiated insight into the benefits of aromatherapy.

Keywords. aromatherapy, feasibility, benefits, hospice, care providers.

DUTCH SUMMARY

‘Zin geven aan geuren’, Aromatherapie in Academisch Hospice Demeter: Een Studie naar de Haalbaarheid en Voordelen

Inleiding. Omdat reguliere zorg vaak onvoldoende symptoomverlichting geeft, doen steeds meer terminale patiënten een beroep op interventies als aromatherapie. Aromatherapie heeft bij deze populatie positieve effecten op psychologische symptomen, angst, depressie en onrust laten zien. In Nederland wordt aromatherapie echter maar beperkt in hospices aangeboden.

Doel en Onderzoeksvragen. Onderzoeken wat de haalbaarheid en voordelen van aromatherapie in het hospice zijn.
Hoofdvraag: Wat is de haalbaarheid van het toepassen van aromatherapie bij hospice patiënten zoals ervaren door verpleegkundigen en zorgvrijwilligers in het hospice?
Subvraag: Wat zijn de mogelijke voordelen van aromatherapie op angst, somberheid, onrust en kwaliteit van leven van hospice patiënten?

Methode. Haalbaarheid is beoordeeld middels een vragenlijst die verstuurd was onder 62 zorgverleners. De voordelen van aromatherapie zijn onderzocht middels een case studie en USD (Utrechts Symptoom Dagboek) scores van een patiënt die aromatherapie ontving.

Resultaten. Van de 62 zorgverleners hebben 32 de vragenlijst teruggestuurd, wat een respons van 73.3% voor de verpleegkundigen en 59.6% voor de zorgvrijwilligers inhield. De zorgverleners hadden een positieve houding tegenover aromatherapie, maar er zijn ook tegenstellingen gevonden in de antwoorden. Zorgvrijwilligers waren significant minder positief over praktische aspecten. USD scores lieten geen voordeel zien, de dagelijkse rapportage wel.

Conclusie. Alle zorgverleners hebben een positieve houding tegenover aromatherapie. Verpleegkundigen ervaren een toegenomen werkdruk en zorgvrijwilligers ervaren te weinig scholing en praktische problemen. De voordelen van aromatherapie op angst, somberheid, onrust en kwaliteit van leven zijn niet gemeten maar wel geobserveerd en gerapporteerd door zorgverleners.

Aanbevelingen. Toekomstig onderzoek moet zich richten op de herkomst van de tegenstrijdige antwoorden van de zorgverleners en op het verkrijgen van meer onderbouwde inzichten in de voordelen van aromatherapie.

Trefwoorden. aromatherapie, haalbaarheid, voordelen, hospice, zorgverleners.

1. INTRODUCTION

The number of palliative care and hospice programs have grown rapidly in recent years as a result of the recognition of the unique constellation of skills that are required to manage the symptoms and needs of terminally ill patients (National Quality Forum, 2006).

Palliative care is defined by the World Health Organization as an approach that improves the quality of life of patients and their families facing problems associated with a life-threatening illness. This is done through the prevention and relief of suffering by means of early identification, assessment and treatment of pain and other physical, psychosocial and spiritual problems (Sepúlveda, Marlin, Yoshida, & Ullrich, 2002).

Mistianen, VanRuth, and Francke (2006) found that between 2003 and 2005 the number of patients receiving palliative care in hospitals, hospices and at home in the Netherlands increased from 5000 to 6500. Due to an aging population with its increase in chronic diseases and cancer, the expectation is that this number will rise with approximately one percent each year.

Patients near the end of life may experience extreme symptoms that include physical, spiritual and psychological suffering. (Rome, Luminais, Bourgeois, & Blais, 2011). Treatment of these symptoms requires a holistic, multidisciplinary approach focusing on pain and symptom control and quality of life (VanMechelen et al., 2012).

Despite the current holistic and multidisciplinary care, practice shows that more terminally ill patients reach out to Complementary and Alternative Medicine (CAM) interventions because conventional care provides insufficient relief of their symptoms (Correa-Velez, Clavarino, Barnett, & Eastwood, 2003).

The National Center for Complementary and Alternative Medicine (NCCAM) defines CAM as a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine. (Tilden, Drach, & Tolle, 2004).

A variant of CAM which has been studied extensively is aromatherapy. Aromatherapy is the therapeutic use of essential oils from plants. In the Netherlands aromatherapy is usually applied by nurses and other care providers once they are trained (V&VN Oncologie en V&VN Palliatieve Verpleegkunde., 2007). Several studies investigated the effects of aromatherapy on psychological symptoms in a palliative population. Significant improvements on psychological symptoms like (Wilkinson, Aldridge, Salmon, Cain, & Wilson, 1999), anxiety (Wilkinson et al., 1999; Kyle, 2006; Wilkinson et al., 2007), depression (Wilkinson et al.,

2007) and also quality of life (Wilkinson et al., 1999) after aromatherapy massage were found.

Because of the positive effects, aromatherapy is offered increasingly more in hospices in England, Wales (Lewith, Broomfield, & Prescott, 2002) and Washington (Kozak et al., 2009). In the Netherlands however, such an increase has not been registered. Aromatherapy is offered in only 23% of all hospices (Integraal kankercentrum Nederland., 2010).

2.1 PROBLEM STATEMENT

Patients near the end of life may experience multiple symptoms caused by their underlying illness. Because conventional care provides insufficient relief, these patients reach out to CAM interventions like aromatherapy increasingly more. Aromatherapy has shown positive effects in this population on psychological symptoms, anxiety, depression and quality of life. In the Netherlands, however, the application of aromatherapy in hospices is limited.

2.2 AIM

The main aim of this study was to establish the feasibility of aromatherapy as experienced by hospice nurses and care volunteers and explore if they have different experiences. This information provides insight into the integration and application of the intervention into daily care, what adjustments/improvements would be necessary to improve this and if nurses and care volunteers have different needs when it comes to feasibility. A secondary aim was exploring the benefits of aromatherapy on anxiety, depressed mood, restlessness and quality of life in hospice patients.

2.3 RESEARCH QUESTIONS

Primary research question: What is the feasibility of delivering aromatherapy to hospice patients as experienced by hospice nurses and care volunteers?

Secondary research question: What are the possible benefits of aromatherapy on anxiety, depressed mood, restlessness and quality of life in hospice patients?

3. METHODS

Study Design

This study had a quantitative, prospective, descriptive design in order to describe the feasibility and benefits of aromatherapy in the present (Portney & Watkins 2009). Written approval for this study was obtained from the Medical Ethics Committee of University Medical Center Utrecht in Utrecht, the Netherlands, protocol number 12-588/C. Written informed consent was obtained from participants.

Sample

The study was conducted in Academic Hospice Demeter, a high care academic hospice which has eight rooms. The target populations were hospice care providers and patients. We based this study on a convenience sample. Hospice care providers were included if they were nurses or care volunteers of Academic Hospice Demeter. Patients were included if they received aromatherapy and were cognitively able to give informed consent and answer the Utrecht Symptom Diary. Only one patient met the inclusion criteria during the research period and was included in the study.

Data Collection Instruments

The study started in January 2013 and took six months (Figure 1).

Feasibility was assessed with a questionnaire, developed by the researcher based on the concepts of Bowen et al. (2009). Bowen et al. (2009) states that feasibility consists of eight general areas of focus which can be used to address this parameter. In this study we addressed: acceptance of the intervention, practical concerns and adaptation and integration in the daily routine because these aspects provided information about the integration and application of the intervention.

The questionnaire consisted of demographic data on function, gender, age and duration of employment and 17 feasibility statements on a four point Likert scale (‘disagree – agree’). After every aspect the care provider was asked how this aspect could be improved. This questionnaire design gave us the opportunity to make a quantitative statement about the abovementioned aspects of feasibility and also the option to enlighten these aspects.
The questionnaire was developed by the researcher and reviewed by the CAM therapist of Academic hospice Demeter, who looked at the content, and the director of Academic hospice Demeter, who looked at the methodological aspects to attain face and content validity of the questionnaire.

The benefits of aromatherapy on anxiety, depressed mood, restlessness and quality of life were assessed with the Utrecht Symptom Diary (USD) (UMCUtrecht, 2012). The USD is a modified version of the Edmonton Symptom Assessment System and includes 13 symptoms on a scale of zero to ten, where zero means no suffering and ten means unbearable suffering. For the abovementioned symptoms no clear evidence exists as to what the most optimal cut off points are. A score of four or higher is suggested as a clinically relevant burden (Oldenmenger, Raaf de, Klerk de, & Rijt van der, 2013). De Nijs et al. (2012) tested the USD on reliability, face validity and feasibility. The USD was decided as a usable instrument for daily practice. Reliability and face validity of USD was acceptable for cancer patients in hospital and hospice settings. These findings were submitted for publication.

Data Collection Procedures

The feasibility questionnaire along with the information letter and informed consent form were sent to the house addresses of 15 nurses and 49 care volunteers of Academic Hospice Demeter at the end of January by the researcher. The questionnaire was anonymous. Multiple reminder emails were send to these care providers to obtain a representative sample. The care providers had four weeks to return the questionnaire.

The patient for the case study was included in February 2013 by the researcher. After the patient consented the USD was recorded before, during and 30 minutes after aromatherapy on five different days during two weeks by the care providers. Demographic data of the enrolled patient on gender, age, disease, type of symptom and type of aromatherapy were gathered from the medical records on a checklist along with USD scores, background information and quotes from the daily reporting. This was done in April 2013 by the researcher.

Data Analysis

All data was analyzed univariatly with SPSS 20 (de Vocht, 2012).

Demographic data of care providers were analyzed with descriptive statistics. Percentages of function, gender, age and the mean(sd) duration of employment were displayed in a table. Chi Square tests were performed to evaluate if nurses and care volunteers differed on age and gender. This test was the most appropriate because we wanted to analyze if two categorical variables (type of care provider and age - gender) were related. However we could not meet the assumptions for the Chi Square test. Therefore we performed a Mann Whitney test instead. A Mann-Whitney tests was also employed to evaluate if nurses and care volunteers differed on duration of employment. A Mann-Whitney test was the most

appropriate because we wanted to analyze two independent samples but could not meet the criteria for the independent samples t-test.

Data concerning feasibility were described by numbers and percentages. The difference in answers between nurses and care volunteers on the 17 statements were analyzed with Chi Square tests. Unfortunately we could not meet the assumptions for the Chi Square test, even after combining the four answer categories into two (agree – disagree). So we performed a Mann Whitney test instead. The answers to the open ended questions were described.

USD data was described in a table to give insight into the difference and direction in symptom severity before and after the intervention. These outcomes and information on background, aromatherapy, symptoms and follow up were described in order to give insight into the process of aromatherapy in Academic Hospice Demeter and the possible benefits.

4. RESULTS

Characteristics of care providers

Questionnaires were distributed among 15 nurses and 47 care volunteers. Of the 62 eligible care providers 39 responded and were included in the study, showing a response rate of 62.9% (Figure 2). This is considered to be a representative sample of the staff (Portney & Watkins, 2009) (Polit & Beck, 2012). Among these 39 care providers 11 (28.2%) were nurses and 28 (71.8%) care volunteers, showing a response rate of 73.3% for the nurses and 59.6% for the care volunteers. The majority was female (84.6%) and older than 55 years (53.8%). The mean years of service in Academic hospice Demeter was 3 years and 4 months (Table 1). Care volunteers were older than nurses (p=.005).

Feasibility of aromatherapy

Table 2 presents questionnaire statements and outcomes.

Nurses and care volunteers have significantly different opinions about education, competence level and availability of materials. Care volunteers find the education on aromatherapy as diffusion less sufficient than nurses (p=.041) and find themselves less competent is applying aromatherapy (p=.027). More nurses know where to find the necessary materials to apply aromatherapy (p=.009) and feel that these materials are always accessible to them (p=.015).

Both nurses and care volunteers have a positive attitude towards aromatherapy but nurses appear to think more about applying aromatherapy when a patient experiences symptoms than care volunteers and are more positive about their experience in treating symptoms. However, nurses are less positive about the consistency of aromatherapy with the daily routine of the hospice. And although almost all nurses feel competent, sufficiently educated, understand the protocols and find the intervention easy to apply and not complex, more than fifty percent of the nurses don't think their knowledge of aromatherapy is sufficient. Furthermore, more than fifty percent find that aromatherapy adds to the workload, even though the majority of the nurses know where to find the materials to apply aromatherapy, always have access to these materials and find that there is sufficient staff to carry out the intervention.

A large amount of the care volunteers find the education on and their knowledge of aromatherapy insufficient and don't feel competent. However, the majority understands the protocols and find the intervention easy to apply and not complex, just like the nurses. And although a large amount of the care volunteers don't know where to find the necessary materials and feel that they are not always accessible, they are positive about the consistency of aromatherapy with the daily routine and the majority doesn't think it adds to the workload. They majority even finds that they have enough time and staff to carry out the intervention.

The open ended questions revealed that there is a need for more education, time, staff and that attention should be paid to aromatherapy during change of shifts. Also, application of aromatherapy should become more integrated in the care plan of the patient, the welcome brochure and the medication list. Improving availability of materials were mentioned when the care providers were asked how the adaptation and integration in daily routine could be improved.

Benefits of Aromatherapy, a Case Study

Background

Mrs. Smit, a 79 year old woman diagnosed with vulvar cancer, was admitted to Demeter on the 27th of December 2012. She started receiving hand massage with oil of roses on the 29th of December. During the hand massage a aroma stone with lavender oil was lit. Mrs. Smit started following art therapy on the 7th of January. The daily reporting states that she found joy and relaxation in this therapy. When a therapist was telling a story she relaxed; ´her respiration slowed down en she is completely calm´.

Indication for aromatherapy

Mrs. Smit started receiving aromatherapy two days after admittance. There was no aromatherapy protocol in the care plan and her file did not state any specific symptoms for which this aromatherapy was initiated, it was part of the general interventions section of the care plan. It simply stated that she liked hand massage and that the aroma stone was supposed to be lit during this massage. Care providers occasionally reported that Mrs. Smit received aromatherapy and that she enjoyed it, no specific effects or symptoms were mentioned.

Symptoms

When we read the day to day reporting in Mrs. Smits file, she started experiencing a depressed mood and decreased quality of life in the beginning of February, a month after aromatherapy was initiated. Het file stated on the 19th of February that ´she seems depressed, she feels like this is taking too long and that she is a burden to others´. This was the first time these symptoms were mentioned. The USD scores on that day were two on depressed mood and five on QOL. After this first notion, these symptoms were mention more often in the daily reporting and USD scores on these symptoms stayed elevated. On the 17th of March Mrs. Smit scored an eight on depressed mood, it was reported that this score was elevated and that she felt relaxed after aromatherapy massage.

Measuring benefit of aromatherapy

The severity of symptoms on the USD before, during and 30 minutes after the intervention, during five days were measured by nurses providing the intervention.

The results of these measurements are stable (Table 3).
Anxiety was scored as a two on day three in comparison to a zero on day one, four and five. Only on day two a difference is measured between before and after scores, a score of two before the intervention dropped to a zero 30 minutes after the intervention.
The scores on depressed mood showed little variation, scores of three were found on day two and three and scores of two were found on day four and five. Day one showed a difference between before, during and 30 minutes after the intervention. Scores dropped from three before to two during and after the intervention.
Restlessness showed no variation.
Quality of Life (QOL) scored a five on day one, two, four and five. On day three scores dropped from five before the intervention to two/three during and 30 minutes after the intervention.

Data is missing on day two, there are no scores during the intervention and there is no 30 minute after score on QOL.

Follow up

In March and April Mrs. Smit was experiencing a depressed mood and decreased quality of life increasingly more. These symptoms were mentioned in the reporting more often and the USD scores stayed elevated. Depressed mood became a mark on the overview of patient specific problems. Mrs. Smit and her doctor started talking about euthanasia because she felt her life was unbearable.

5. DISCUSSION

This study provides insight into the feasibility and benefits of aromatherapy in a Dutch academic hospice setting. The results showed that nurses were significantly more positive about education, competence level and availability of materials than care volunteers. Contradicting statements were found for both nurses and care volunteers. Although almost all nurses have a positive view on aromatherapy, sufficient education and no practical concerns, a large amount is not positive about the consistency of aromatherapy with the daily routine, don't think their knowledge of aromatherapy is sufficient and feel it adds to the workload. The majority of the care volunteers have a positive view on aromatherapy but they do experience educational, competence and practical problems. However, most find the intervention easy to apply and not complex, are positive about the consistency of aromatherapy with the daily routine and don't think it adds to the workload.
The CAM therapist of the hospice explained that the care volunteers had not had the education on aromatherapy as diffusion at the time the questionnaire was distributed. Furthermore, the materials to apply aromatherapy are presently only accessible to nurses. This explains the educational and practical problems and could have influenced the competence level of the care volunteers but also the increase in workload which the nurses experienced. A systematic review into aromatherapy practice in nursing (Maddocks-Jennings & Wilkinson, 2004) showed that many nurses are attracted to the notion of integrating therapeutic interventions such as aromatherapy into patient care. This was also found in a survey among primary care practitioners (van Haselen, Reiber, Nickel, Jacob & Fisher, 2004). This complies with our findings in care provider's attitude towards aromatherapy. These studies also pointed out that education is very important. The review pointed out that care providers should only apply aromatherapy when they are sufficiently educated and feel competent and the survey showed an urgent need for further educating the professionals.

This aspect was also apparent in our results, care volunteers found their education on aromatherapy insufficient and consequently did not feel competent, whereas nurses, whom were properly educated, did feel competent. Education therefore is a very important aspect which requires attention.
The case study provided insight into benefits of aromatherapy. Scores in symptom severity stayed relatively stable between the five days and between the three measurement moments and therefore did not indicate any benefit. Mrs. Smit received pain medication twice during these days, this could have influenced the scores. The daily reporting in Mrs. Smit's file however frequently stated how much she enjoyed aromatherapy and that it calmed her. These reports comply with a case report done by Gilliand (1999). However as time progressed, symptoms worsened despite aromatherapy. Aromatherapy could only have short term effects (Wilkinson et al., 2007) or a deterioration in Mrs. Smit's illness could have caused this worsening of symptoms (Rome et al., 2011).

The results of the current study could be of interest for hospices whom have not yet introduced aromatherapy. The response rate for the questionnaire was 62.9%. This is considered a good basis to draw conclusions from (Portney & Watkins, 2009) (Polit & Beck, 2012). Although the questionnaire was developed based on feasibility literature, it was not validated. Therefore we could have missed some aspects of feasibility or could have measured it inadequately. Furthermore we had missing data for which we could not employ follow up because the questionnaire was coded, this could have biased the results. We could not meet the assumptions for the Chi Square test, our initial statistical analysis, therefore we performed a non parametric, less powerful test, the Mann Whitney test instead. Due to limited eligible patients, only one patient was included to explore the benefits of aromatherapy. This was such a small sample that we decided to perform a case study in order to get more in depth information and gain insight into possible benefits.

Our sample consisted of nurses, care volunteers and a hospice patient, whom are present in every hospice, this enhances generalizability of the results. Generalizability is limited however by the fact that this study was performed in an high care academic hospice in the Netherlands, which have different organizational structures and facilities than usual hospices.

6. CONCLUSION

Nurses and care volunteers experience feasibility differently. This is mainly caused by a difference in education and availability of materials. All care providers have a positive attitude towards aromatherapy but nurses experience an increase in workload and care providers

experience educational and practical problems. Benefits of aromatherapy on anxiety, depressed mood, restlessness and quality of life were not measured but care providers did observe and report positive effects.

7. RECOMMENDATIONS

This study provided some preliminary insights into the feasibility and benefits of aromatherapy in an academic hospice setting. Future research in this area should focus on getting more in depth information about the feasibility and exploration of the contradicting statements, possibly by means of interviews. Furthermore, research should focus on exploring the benefits of aromatherapy with a bigger patient sample.

The hospice should pay more attention to sufficient education of all care providers, availability of materials and increase in workload.

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TABLES

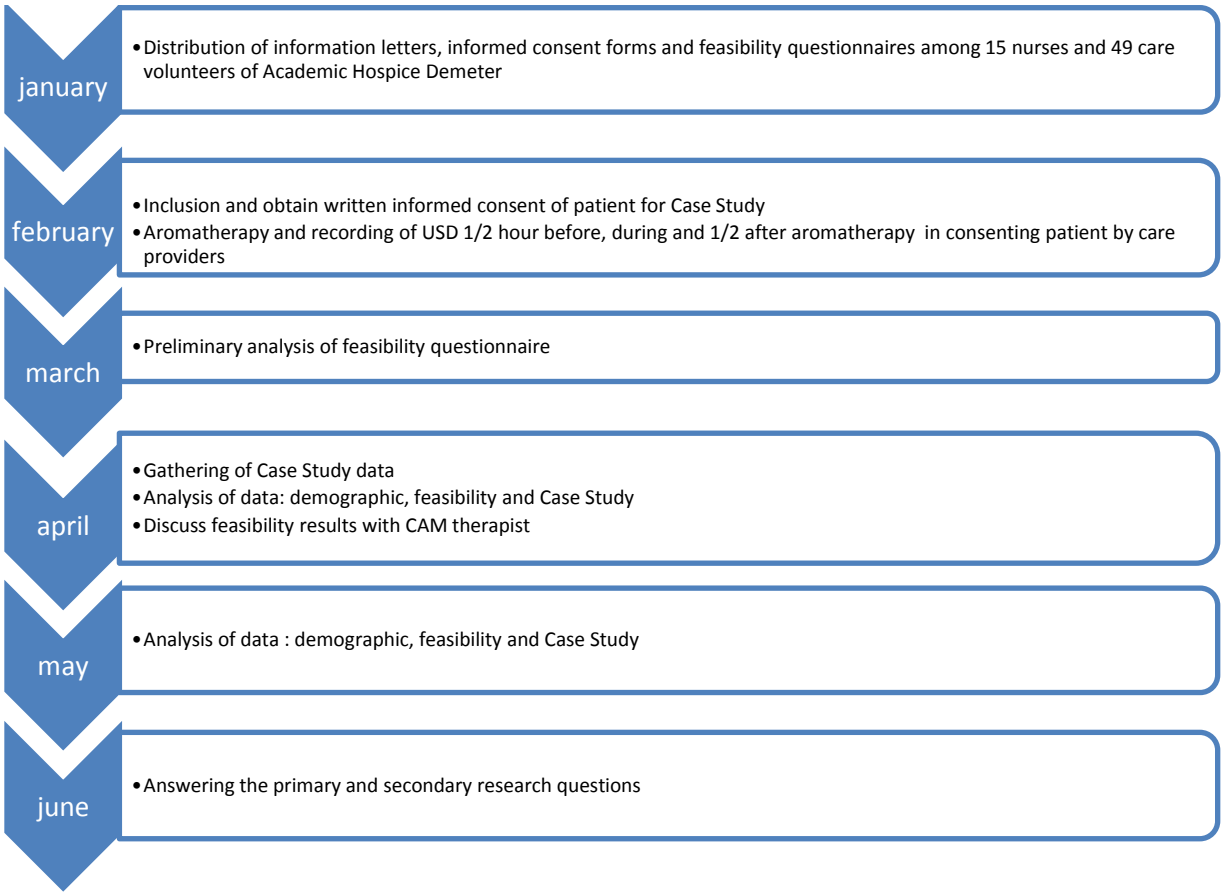

Figure 1. Flowchart of study procedures.

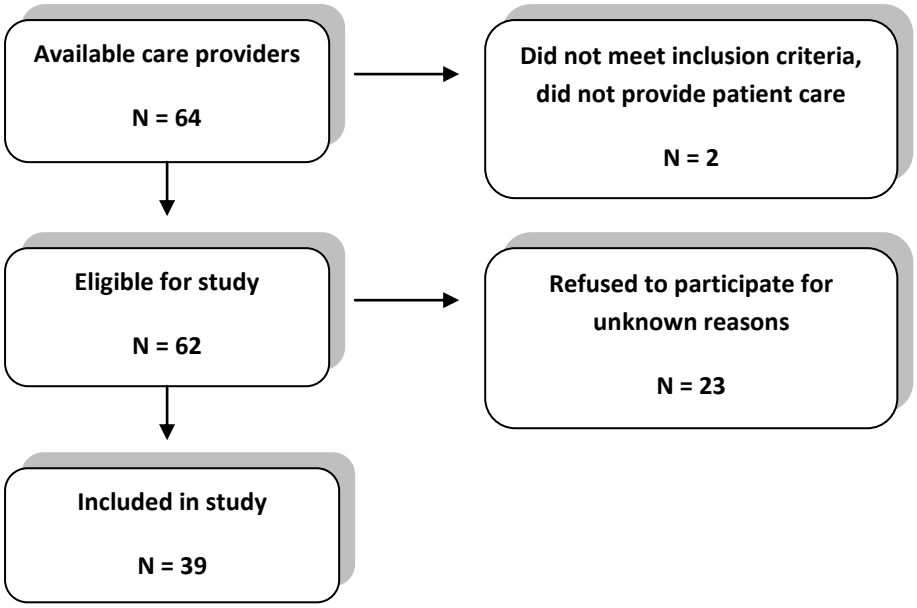

Figure 2. Flowchart of included care providers.

Table 1

Demographical characteristics of care providers and the subgroups nurses and care volunteers

Variable		**Care providers** (N = 39)	**Nurses** (N = 11)	**Care volunteers** (N = 28)	**p**
Function (%)	Nurse	11 (28.2%)			
	Care volunteer	28 (71.8%)			
Female (%)		33 (84.6%)	11 (100%)	22 (78.6%)	.099
Age (%)					.005*
	< 25 years	0 (0%)	0 (0%)	0 (0%)	
	25 - 35 years	3 (7.7%)	2 (18.2%)	1 (3.6%)	
	35 - 45 years	3 (7.7%)	1 (9.1%)	2 (7.1%)	
	45 - 55 years	11 (28.2%)	6 (54.5%)	5 (17.9%)	
	> 55 years	21 (53.8%)	2 (18.2%)	19 (67.9%)	
	missing	*1 (2.6%)*		*1 (3.6%)*	
Mean (SD) years of service (years.months)		3.4 (2.0)	3.9 (2.1)	3 (1.9)	.205
	missing (%)	*4 (10.3%)*	*1 (2.6%)*	*3 (7.7%)*	
Response rate questionnaire (%)		62.9%	73.3%	59.6%	

Note. Values are numbers (percentages) unless stated otherwise; * significant (significance level: p≤0.05)

Table 2

Results of feasibility questionnaire for subgroups nurses and care volunteers

Aspect of feasibility		**Nurses**	**CV**	**p**
Acceptation of aromatherapy				
1. I have a positive view on the effect of aromatherapy				.313
	Agree (%)	9 (81.8)	26 (92.9)	
	Slightly agree (%)	2 (18.2)	2 (7.1)	
	Slightly disagree (%)	0	0	
	Disagree (%)	0	0	
	Missing (%)			
2. Aromatherapy complies with the vision of the hospice on patientcare				.265
	Agree (%)	11 (100)	23 (82.1)	
	Slightly agree (%)	0	2 (7.1)	
	Slightly disagree (%)	0	2 (7.1)	
	Disagree (%)	0	1 (3.6)	
	Missing (%)			
3. If a patient experiences symptoms, I think of applying aromatherapy				.2
	Agree (%)	1 (9.1)	7 (25)	
	Slightly agree (%)	9 (81.8)	13 (46.4)	
	Slightly disagree (%)	0	5 (17.9)	
	Disagree (%)	1 (9.1)	3 (10.7)	
	Missing (%)			
4. I have positive experiences with aromatherapy to treat patients symptoms				.073
	Agree (%)	4 (36.4)	12 (42.9)	
	Slightly agree (%)	7 (63.6)	6 (21.4)	
	Slightly disagree (%)	0	4 (14.3)	
	Disagree (%)	0	2 (7.1)	
	Missing (%)		4 (14.3)	
5. Aromatherapy adds value to patientcare				.36
	Agree (%)	7 (63.6)	22 (78.6)	
	Slightly agree (%)	4 (36.4)	3 (10.7)	
	Slightly disagree (%)	0	2 (7.1)	
	Disagree (%)	0	0	
	Missing (%)		1 (3.6)	
Practical concerns				
6. My knowledge of aromatherapy is sufficient				.724
	Agree (%)	0	2 (7.1)	
	Slightly agree (%)	6 (54.5)	11 (39.3)	
	Slightly disagree (%)	3 (27.3)	4 (14.3)	
	Disagree (%)	2 (18.2)	10 (35.7)	
	Missing (%)		1 (3.6)	
7a. The education on aromatherapy as diffusion is sufficient				.041*
	Agree (%)	3 (27.3)	7 (25)	
	Slightly agree (%)	6 (54.5)	5 (17.9)	
	Slightly disagree (%)	0	4 (14.3)	
	Disagree (%)	1 (9.1)	7 (25)	
	Missing (%)	1 (9.1)	5 (17.9)	
7b. The education on aromatherapy as massage is sufficient				.101
	Agree (%)	6 (54.5)	11 (39.3)	
	Slightly agree (%)	4 (36.4)	9 (32.1)	
	Slightly disagree (%)	0	3 (10.7)	
	Disagree (%)	0	3 (10.7)	
	Missing (%)	1 (9.1)	2 (7.1)	
8. I am competent in applying aromatherapy				.027*
	Agree (%)	1 (9.1)	4 (14.3)	
	Slightly agree (%)	9 (81.8)	9 (32.1)	
	Slightly disagree (%)	1 (9.1)	4 (14.3)	
	Disagree (%)	0	8 (28.6)	
	Missing (%)		3 (10.7)	
9. The protocols are clear				.149
	Agree (%)	3 (27.3)	9 (32.1)	
	Slightly agree (%)	7 (63.6)	8 (28.6)	
	Slightly disagree (%)	0	4 (14.3)	
	Disagree (%)	1 (9.1)	4 (14.3)	
	Missing (%)		3 (10.7)	

10. The intervention is easy to apply				.772
	Agree (%)	3 (27.3)	13 (46.4)	
	Slightly agree (%)	7 (63.6)	8 (28.6)	
	Slightly disagree (%)	1 (9.1)	2 (7.1)	
	Disagree (%)	0	1 (3.6)	
	Missing (%)		4 (14.3)	
11. The intervention is complex				.059
	Agree (%)	0	1 (3.6)	
	Slightly agree (%)	0	5 (17.9)	
	Slightly disagree (%)	7 (63.6)	6 (21.4)	
	Disagree (%)	4 (36.4)	10 (35.7)	
	Missing (%)		6 (21.4)	
Adaptation and integration in daily routine				
12. I know where to find the nescessary materials to apply aromatherapy				.009*
	Agree (%)	5 (45.5)	5 (17.9)	
	Slightly agree (%)	5 (45.5)	10 (35.7)	
	Slightly disagree (%)	0	6 (21.4)	
	Disagree (%)	0	7 (25)	
	Missing (%)	1 (9.1)		
13. These materials are always accessible to me				.015*
	Agree (%)	9 (81.8)	8 (28.6)	
	Slightly agree (%)	1 (9.1)	7 (25)	
	Slightly disagree (%)	0	5 (17.9)	
	Disagree (%)	0	6 (21.4)	
	Missing (%)	1 (9.1)	2 (7.1)	
14. There is sufficient staff to carry out the intervention				.149
	Agree (%)	2 (18.2)	7 (25)	
	Slightly agree (%)	5 (45.5)	7 (25)	
	Slightly disagree (%)	2 (18.2)	13 (46.4)	
	Disagree (%)	0	1 (3.6)	
	Missing (%)	2 (18.2)		
15. Aromatherapy is consistent with the daily routine in the hospice				.157
	Agree (%)	3 (27.3)	24 (85.7)	
	Slightly agree (%)	4 (36.4)	1 (3.6)	
	Slightly disagree (%)	3 (27.3)	2 (7.1)	
	Disagree (%)	0	1 (3.6)	
	Missing (%)	1 (9.1)		
16. I have enough time to apply aromatherapy				.36
	Agree (%)	1 (9.1)	5 (17.9)	
	Slightly agree (%)	4 (36.4)	13 (46.4)	
	Slightly disagree (%)	4 (36.4)	6 (21.4)	
	Disagree (%)	1 (9.1)	3 (10.7)	
	Missing (%)	1 (9.1)	1 (3.6)	
17. Application of aromatherapy adds to the workload				.394
	Agree (%)	0	2 (7.1)	
	Slightly agree (%)	6 (54.5)	10 (35.7)	
	Slightly disagree (%)	1 (9.1)	4 (14.3)	
	Disagree (%)	2 (18.2)	10 (35.7)	
	Missing (%)	2 (18.2)	2 (7.1)	

Note. Values are numbers (percentages) unless stated otherwise; CV = care volunteer; * significant (significance level: p≤0.05)

Table 3

Severity of symptoms scored on the USD before, during and 30 minutes after the intervention on five different days

	Day one			**Day two**			**Day three**			**Day four**			**Day five**		
Symptoms	before	during	after	before	during	after	before	during	after	before	during	after	before	during	after
anxiety	0	0	0	2	*	0	2	2	2	0	0	0	0	0	0
gloom/depression	3	2	2	3	*	3	3	3	3	2	2	2	2	2	2
restlessness	0	0	0	0	*	0	0	0	0	0	0	0	0	0	0
QOL	5	5	5	5	*	*	5	2\3	2\3	5	5	5	5	5	5

*Note.*QOL = Quality of Life; * = missing value