INTEGRATIVE THERAPIES IN INTENSIVE CARE UNITS: A SCOPING REVIEW

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ABSTRACT

Aim: We reviewed literature describing the incorporation of integrative therapies in intensive care units. We aimed to elicit an overall picture of research and find existing knowledge gaps on this topic.

Design: We conducted a scoping review guided by Arksey and O'Malley's methodological framework and were guided by the PRISMA-ScR Checklist.

Methods: Various databases were searched for relevant literature. English language articles published between 1999 and 2019 were retrieved. Data were extracted based on sample, sample size, methodology, findings and implications for practice.

Results: From 275 studies retrieved, 30 were included, based on the inclusion criteria. Three key themes related to integrative therapies in intensive care units emerged from the literature: 1) interventions using integrative therapies; 2) perceptions and attitudes of nurses on integrative therapies; and 3) general information on integrative therapies. Positive outcomes were observed in ICUs and nurses showed positive attitudes towards using integrative therapies.

SUMMARY STATEMENT

What is already known about this topic?

- An increasing demand for the inclusion of integrative therapies in hospitals exist.
- Healthcare professionals are incorporating integrative therapies into their western medicine practices.
- Little is known about the incorporation of integrative therapies in intensive care units.

What does this paper add?

- Interventions using integrative therapies and outcomes in intensive care units.

- Perceptions and attitudes of nurses working in intensive care units regarding the use of integrative therapies.
- General information on integrative therapies in intensive care units, which includes benefits and risks; ethical and legal issues; challenges of incorporating integrative therapies and collaboration among healthcare professionals, patients and families.

What are the implications of this paper?

- The paper may influence the formulation of policies to formally include the use of integrative therapies in intensive care units.
- In practice, healthcare professionals may consider including the integrative therapies which have resulted in positive outcomes in this paper.
- Findings may signify the need for the possible inclusion of integrative therapies in the critical care nursing curriculum.
- Further research may need to be conducted to determine the efficacy of the integrative therapies mentioned in this paper.

Key Terms: family, healthcare professionals, integrative therapies, intensive care unit

INTRODUCTION

Patients and their families are increasingly demanding that integrative therapies be incorporated in hospitals, resulting in some of these therapies being incorporated into western medicine approaches (Kramlich, 2017). Integrative therapies are broadly defined as holistic therapeutic modalities that are not part of western medicine (Brewer et al., 2019). Integrative therapies are founded on the holistic approach to healthcare, focusing on the mind-body connection (Orkaby & Greenberger, 2015). According to Balouchi et al. (2016), integrative therapies are broadly classified into three groups: 1) mind-body practices; 2) naturally occurring products; and 3) other complementary strategies. Mind-body practices include massage, prayer and meditation; whilst naturally occurring products comprise of herbs, roots and plant-based compounds. Other complementary approaches include traditional medicine developed and prescribed by traditional healers (Balouchi et al., 2016). In the African context, integrative therapies include local herbal medicines and products, indigenous healthcare practices, as well as borrowed western approaches such as acupuncture and chiro-practice (James et al., 2018). There is evidence that traditional medicine is an effective and acceptable method of healthcare in African communities

(Moeta et al., 2019). African people may also seek healthcare from traditional health practitioners before visiting healthcare professionals (Gureje et al., 2015). Anderson et al. (2017) highlight that integrative therapies are often used in chronic care settings and could potentially be applied in the intensive care unit (ICU).

In the ICU, healthcare professionals are science focused and mainly use western medicine as a model of care (Marshall et al., 2017). Western medicine is grounded in the biomedical approach (Orkaby & Greenberger, 2015) which primarily focusses on determining and curing the specific cause of diseases, such as microorganisms, gene mutations, metabolic imbalances, or enzyme deficiencies. According to the biomedical approach, diseases are diagnosed and treated based on empirical evidence (Orkaby & Greenberger, 2015). In the ICU, care focuses on preventing physiologic failure of vital organs such as the lungs, heart and kidneys (Marshall et al., 2017). Technological devices include monitors, ventilators, infusion pumps as well as dialysis machines (Tunlind et al., 2015). Although western medicine is mostly used in the ICU, a survey among ICU nurses in the United States of America revealed that some patients and their families requested integrative therapies (Papathanassoglou & Park, 2016).

According to Kramlich (2016), patients or their families will normally ask for integrative therapies in the ICU in three instances: 1) during admission, to proceed with home remedies; 2) when clinical manifestations such as nausea, anxiety, pain, and sleep problems are hard to alleviate; and, 3) at the commencement of end-of-life care. Kramlich (2016) further highlights that families usually request integrative therapies in the ICU when western medicine fails to alleviate the patient's symptoms. Patients may also desire holistic care, including cultural preferences, thus focusing on a more person-centered care model (Kramlich, 2016).

Integrative therapies may be incorporated into western medicine to promote a healing environment (Kramlich 2017) and person-centered care (Papathanassoglou & Park, 2016). To achieve a healing environment, healthcare professionals consider the emotional, physical, behavioral and spiritual aspects of the patient to promote healing (Gonçalves et al., 2017). Person-centered care is a component of holistic care and focuses on the formation of meaningful, healthy relationships between healthcare professionals, patients as well as their families (McCormack & McCance, 2017). Person-centered care is fostered through principles of respect for persons, right to autonomy, as well as mutual respect and understanding (McCormack & McCance, 2017). Evidence suggests favorable outcomes when incorporating integrative

therapies in the ICU, including reduced pain intensity, improved systolic blood pressure and heart rate (Anderson et al., 2017). Other favorable outcomes are reduced intake of sedatives and analgesics, less patient anxiety, shorter stays in the ICU and improved weaning from mechanical ventilators (Papathanassoglou & Park, 2016). Patients have also reported improved quality of sleep (Anderson et al., 2017), more patient and family satisfaction, and reduced hospital costs (Gonçalves et al., 2017). Although evidence supports integrative therapies in ICUs, we could not find any reviews regarding the incorporation of integrative therapies in ICUs. This scoping review synthesizes the published literature on the incorporation of integrative therapies in ICUs.

METHOD

We conducted a scoping review to identify available evidence on the incorporation of integrative therapies in intensive care units. We followed Arksey and O'Malley's methodological framework to guide the review (Arksey & O'Malley, 2005). Using this framework, the study adopted the following five steps: 1) identifying the research question; 2) identifying relevant studies; 3) study selection; 4) charting the data; and 5) collating, summarizing and reporting results. The review was reported according to the Preferred Reporting Items for Systematic Review and Meta-analysis Protocols Extension for Scoping Reviews (PRISMA-ScR) checklist (Tricco et al., 2018).

Research question

The posed question for this scoping review is:
What is known about incorporating integrative therapies in ICUs?

Identifying relevant studies

We conducted an unrestricted preliminary search with the assistance of an information specialist on 22 November 2019 from the following electronic databases: Africa-Wide Information, EBSCOhost, AHFS Consumer Medication Information, CINAHL, Health Source: Nursing/Academic Edition, Google scholar and MEDLINE. The search phrases used included: (complementary and alternative medicine) and/or (integrative health and integrative medicine) and/or (integrative therapy) and/or (complementary health approaches) and/or (traditional medicine) in (ICU or critical care or acute care or intensive care unit). We included only articles written in English. We conducted a second search between December 2019 and April 2020. The search for this review included studies published between 1999 and 2019, because the first article on this topic was published in 1999, according to our search.

Study selection

The preliminary search yielded 275 studies. We did not find any new studies in the second literature search. We assessed each article using the following inclusion criteria: 1) studies relating to integrative therapies in ICUs; 2) studies conducted in English; and 3) studies conducted between 1999 and 2019. We excluded articles that were 1) studies relating to integrative therapies in other healthcare settings; 2) studies conducted in languages other than English; and 3) studies conducted before 1999. Following study selection, 30 articles remained relevant to this scoping review.

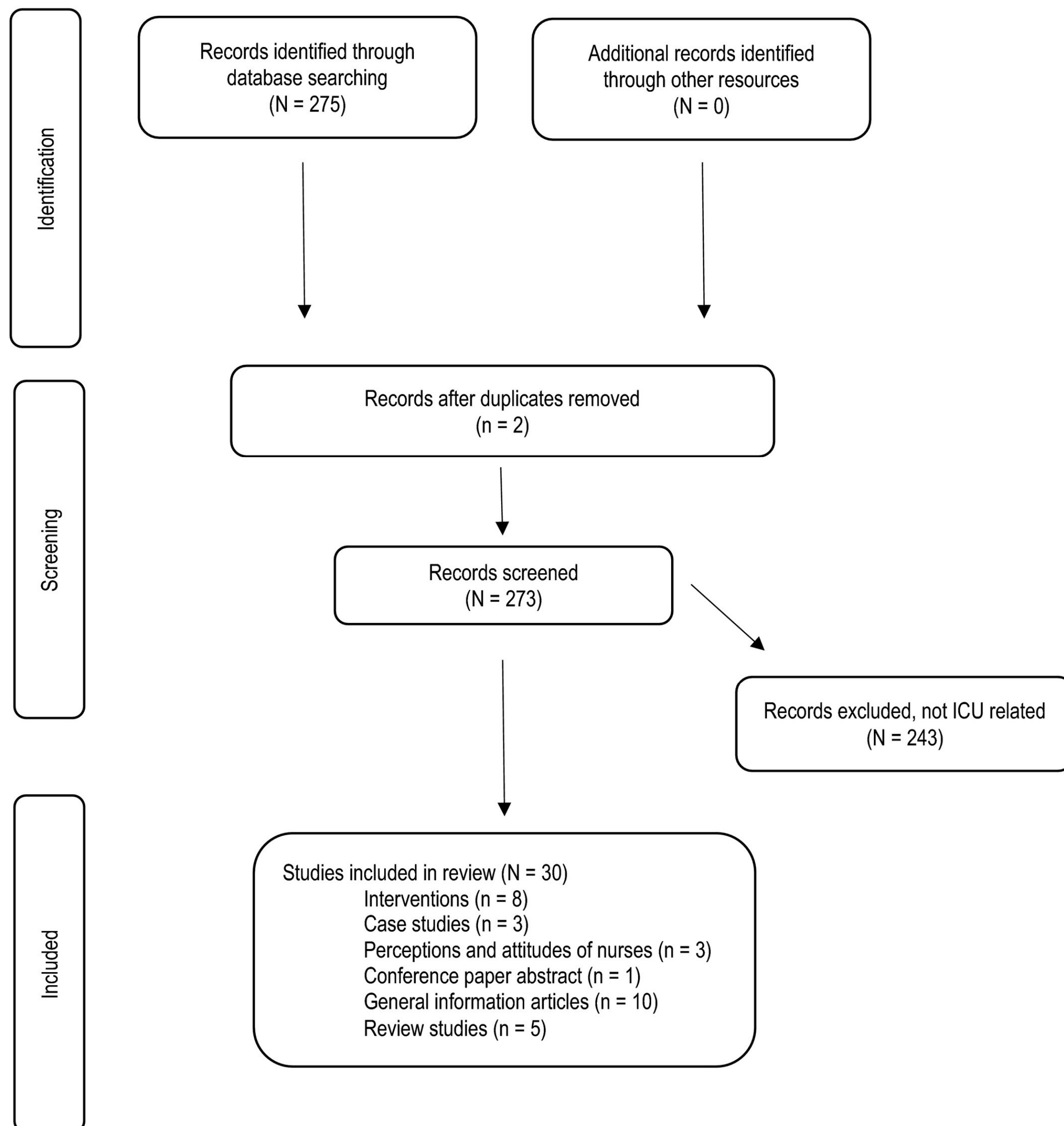

Figure 1. Summary of article selection process for scoping review on integrative therapies in intensive care units

Charting the data

The process of selecting articles is summarized in Figure 1. The research team followed Arksey and O'Malley's (2005) framework. We screened the preliminary list of all articles (N = 275) for duplicates. The authors then examined the abstracts to identify studies for inclusion in the review. Secondly, full texts were assessed and all relevant manuscripts were included. Discrepancy assessments were conducted and discussed between the authors, until everyone agreed on the inclusion of studies.

Collating, summarising and reporting results

Of the 30 selected articles, eight were intervention studies conducted in ICUs, 10 contained general information on integrative therapies and three were case reports. Three articles were based on perceptions and attitudes of nurses, one article was a conference paper abstract and five were review articles. We summarized the information provided on the eight intervention studies, three studies on nurses' perceptions, three case reports, as well as one conference paper abstract. The summary includes the study characteristics, population and sample, methodology, findings/results and other information pertaining to limitations, implications and recommendations for further research. The summarized information is presented in Tables 1, 2, 3 and 4. Information from the general information articles and review studies was consolidated to subthemes.

Ethics

Approval from the Research Ethics Committee was not required since this is a scoping review study.

Table 1: Articles on interventions of integrative therapies in intensive care units

Reference	Population and sampling	Methodology	Results/findings	Other information (Limitations [L], Implications [I] & Further research [FR])
Nicola et al., 2019 Promoting night time sleep in the intensive care unit	Sample: medical and surgical intensive care unit (ICU) patients Sample size: 74 patients	Quantitative, non-controlled pre-post clinical study	Using the Richards Campbell Sleep Questionnaire, the findings indicated that receptive music and foot massage administered by a nurse and student nurse improved the second night quality of sleep for patients that underwent routine medical and surgical procedures	L: Limited generalisability because sample mostly surgical patients FR: Conducting a randomised controlled trial could prevent bias, distortion of results and improve evidence.
Ozlu et al., 2017 Effects of aromatherapy massage on the sleep	Sample: day one post-operation patients	Quantitative, controlled pre-post experimental study.	The application of lavender oil by the nurse researchers caused a statistically significant decrease in the	I: aromatherapy massage improves quality of sleep and diastolic pressure in the ICU

quality and physiological parameters of patients in a surgical intensive care unit	Sampling: convenience sampling Sample size: 60 patients (30 in control group, 30 in experimental group)		diastolic pressure of patients in the experimental group and improved their sleep quality	L: study focused on only extubated patients on day one post-operation, therefore limited generalisability
Matsumoto-Miyazaki et al., 2018 Efficacy of acupuncture treatment for improving the respiratory status in patients receiving prolonged mechanical ventilation in intensive care units: a retrospective observational study	Sample: patients on chronic mechanical ventilation (MV) Sample size: 16 tracheostomised patients receiving mechanical ventilation for 21 days and above	Retrospective observational study	After four acupuncture sessions administered by an acupuncturist, the tidal volume (VT) and dynamic lung compliance (Cdyn) were significantly higher, whereas the respiratory rate (RR), heart rate (HR), and rapid shallow breath index (RSBI) were significantly decreased. Moreover, 11 patients were successfully weaned from mechanical ventilation	I: acupuncture treatment might have beneficial effects on the respiratory status of ICU patients receiving MV and may assist in weaning from mechanical ventilation

Madineh et al., 2017 Impact of garlic tablets on nosocomial infections in hospitalized patients in intensive care units	Sample: ICU patients Sampling: simple random sampling Sample size: 94 patients (47 in control group and 47 in case group)	Double blinded clinical trial	Culture results of intravenous catheter tips were positive in five cases in the control group and there were zero positive cases in the case group. Moreover, urine culture was positive in two cases in the case group and six cases in the control group.	I: garlic tablets may be used as prophylaxis against septicemia and urinary tract infection L: small sample size. FR: a similar study needs to be conducted with a larger sample size
Salamati et al., 2017 Effect of inhalation of lavender essential oil on vital signs in open heart surgery ICU	Sample: post-operative open- heart surgery patients Sample size: 40 patients	Single blind clinical trial	After a cotton swab impregnated by 2% lavender was placed on the patients' masks by a nurse, the blood pressure (BP) and HR were found to be significantly reduced	I: aromatherapy can effectively reduce BP and HR and, as a result, it can be used as an independent nursing intervention in the ICU
Feeney et al., 2017	Sample size: 46 patients	Prospective feasibility study	After three acupuncture sessions administered by seven acupuncturists, about	I: Acupuncture may significantly reduce

Acupuncture for pain and nausea in the intensive care unit: a feasibility study in a public safety net hospital			50% of patients reported an improvement in nausea on the rhodes index after acupuncture treatment. additionally, self-reported pain decreased by 2.36 points on the 10-point numerical and visual analogue scales; a significant reduction in morphine requirements 4 hours after acupuncture sessions was observed as well	nausea and pain in icu patients L: There was no control group, randomization or blinding process; the small sample size in a single center limited generalizability
Papathanassoglou et al., 2018 Effects of an integrative nursing intervention on pain in critically ill patients: a pilot clinical trial	Sample: critical care patients Sample size: 60 patients (30 in control and 30 in intervention groups)	Randomized, controlled, double-blinded repeated measures trial	After relaxation, guided imagery and moderate pressure massage conducted by a nurse, it was reported that the intervention group had 74% less chance of having indications of pain on	L: small number of participants limited generalisability

			the Critical care Pain observation Tool. Additionally, self-reported pain scores on the Numerical Rating Scale and anxiety levels decreased. Sleep quality improved significantly in intervention group.	
Hayes and Cox, 1999 The integration of complementary therapies in north and south thames regional health authorities' critical care units	Sample: intensive care units Sample size: 45 ICUs	A survey	Findings revealed that 60% general ICUs, 75% neonatal ICUs, 10% coronary ICUs and 25% mixed ICUs provided integrative therapies in the region. Therapies provided were massage, aromatherapy, reflexology and therapeutic touch by therapists and trained nurses	I: This are of nursing practice needs to be addressed if the psychosocial care of critically ill patients is to be realised by healthcare professionals

Table 2: Qualitative studies assessing the perceptions and attitudes of nurses toward integrative therapies in intensive care units

Reference	Population and Sampling	Methodology	Results/Findings	Other information (Limitations [L], Implications [I] & Further Research [FR])
Anderson et al., 2016 Examination of the perceptions of registered nurses regarding the use of healing touch in the acute care setting.	Sample: acute care nurses Sample size: 17 nurses Sampling: purposive sampling	Explorative descriptive (Focus group discussions)	Five themes emerged: 1) Benefit to the patient: healing touch alleviated pain, decreased anxiety & calmed agitated patients 2) Benefit to the nurse: used by nurses for self-care to produce relaxation and cope with occupational stress 3) Holism beyond task orientation: healing touch breaks task-oriented delivery of care and encourages a more holistic approach	I: Training in healing touch provides one avenue for healthcare professionals to provide compassionate care

			4) Integrating healing touch into acute care: nurses need to acquire education on healing touch before incorporating it into care 5) Challenges: lack of time and training	
Cooke et al., 2012 Complementary and alternative medicine and critical care nurses: A survey of knowledge and practices in Australia.	Sample: Australian critical care nurses Sample size: 379 critical care nurses	Descriptive, exploratory online survey	• 50.3% respondents sometimes recorded use of integrative therapies on patients' files, whilst 23.1% respondents always recorded them • 38.3% respondents reported that integrative therapies were helpful to patients • 90.6% respondents were open to the use of integrative therapies	I: More nursing education on integrative therapies is necessary FR: Further research to investigate the effect of education as an intervention among nurses

			whilst 9.4% respondents were reluctant • Respondents' sources of knowledge on integrative therapies were: internet, other providers, journals, peers, mass media, physicians and formal training • Barriers were: lack of knowledge, equipment and providers, reluctance of healthcare professionals	
Tracy et al., 2003 Nurse attitudes towards the use of complementary and alternative therapies in	Sample: American critical care nurses Sample size: 348 critical care nurses	Exploratory descriptive survey	• 88% respondents were open to, and 60% reported a greater desire towards the use of integrative therapies	I: Critical care nurses must acquire education on these therapies and their potential benefits to critically ill patients

critical care		• 94.9% respondents had some knowledge on integrative therapies and reported that use must be consistent with legitimacy and proven mechanisms of action • 40% reported knowledge of prayer, massage, music therapy, diet and exercise as integrative therapies • Barriers reported were lack of time, lack of knowledge and reluctance from other healthcare professionals	FR: Further research to determine whether integrative therapies enhance patient experiences and outcomes of critical care

Table 3: Case reports on integrative therapies in intensive care units

Reference	Population and Sampling	Methodology	Results/Findings	Other information (Limitations [L], Implications [I] & Further Research [FR])
Yalindag-Ozturk et al., 2011 Trial of garlic as an adjunct therapy for multidrug resistant Pseudomonas aeruginosa pneumonia in a critically ill infant	Sample size: one infant (1-month-old) admitted to a neonatal ICU	Single case study	After seven days of garlic (1g garlic puree) and antibiotic regimen (intravenous amikacin and piperacillin-tazobactam), the endotracheal tube aspirate and blood cultures were negative for *Pseudomonas aeruginosa.* The clinical status improved, and infant was discharged home three months after this therapy.	I: when conventional treatment fails, enteral garlic administration could be considered as an alternative therapy. FR: more studies are needed to prove the efficacy of this therapy.
Provancha-Romeo et al., 2019	Sample size: one 57-year-old female	An exploratory case study	Findings revealed that after two mind-body sessions	L: the single case study limited generalizability.

Mind-body interventions utilized by an occupational therapist in a medical intensive care unit: An exploratory case study	patient admitted to a medical ICU		conducted by an occupational therapist, the patient's heart rate, respiratory rate, mean arterial pressure significantly decreased. Additionally, her mental status examination on the Richmond Agitation-Sedation Score remained at zero before and after the sessions.	FR: studies should more vigorously address the safety, benefits and feasibility of utilizing mind-body interventions in the ICU; impact of body-mind interventions on occupational performance and participation both in the ICU and after ICU discharge should be explored.
Kreindler et al., 2014 A tongue's tale–A case report of traditional Chinese medicine integration in the cardiology department.	Sample size: one 85-year-old female patient with hypertensive crisis admitted to a cardiology ICU	A case study	After a combination of western medicine (IV labetalol and Isosorbide dinitrate) and four acupuncture sessions, it was observed that the patients BP, anxiety and chest pain decreased significantly	I: The combination of both traditional Chinese medicine (acupuncture) and western medicine has the potential of improving patient outcomes; excellent communication

				among healthcare professionals and acupuncturists is paramount to achieving smooth incorporation of integrative therapies in ICUs

Table 4: Conference paper abstract assessing integrative therapies in intensive care units

Reference	Population and Sampling	Methodology	Results/Findings	Other information (Limitations [L], Implications [I] & Further Research [FR])
Hathaway et al., 2014 Association between integrative care therapies and physiological and therapist-reported pain and presentation	Sample size: 186 neonates admitted to a neonatal ICU (NICU) of a midwestern hospital	Retrospective review of a clinical database	Findings revealed that after sessions of healing touch and massage sessions, there was a decrease in the heart rates, oxygen saturation and therapist-reported pain of neonates	I: Integrative therapies may be useful adjuncts in pain and overall management in the NICU. FR: Controlled research including an active

outcomes among hospitalized neonates	controlled group is necessary to support these findings.

RESULTS

This review included both quantitative and qualitative studies, excluding the general information articles. A total of 14 quantitative studies were included: three surveys, three case studies, three randomized controlled trials and one review of clinical databases. Additionally, there was one non-controlled pre-post study, one controlled pre-post study, one retrospective observational study, and one retrospective feasibility study. We included one qualitative study that used an exploratory descriptive approach.

Three key themes emerged from the scoping review: 1) interventions using integrative therapies; 2) perceptions and attitudes of nurses on integrative therapies; and 3) general information on integrative therapies.

Theme 1: Interventions using integrative therapies

The use of integrative therapies in ICUs was investigated in eight quantitative studies (Hayes & Cox, 1999; Ozlu & Bilican, 2017; Matsumoto-Miyazaki et al., 2018; Madineh et al., 2017; Salamati et al. 2017; Feeney et al., 2017; Papathanassoglou et al., 2018; Nicola et al., 2019;) and five reviews (Richards et al., 2003; Lee & Higgins, 2010; Tracy & Chlan, 2011; Erdogan & Atik, 2017; Jagan et al., 2019) (Table 1). Three case studies (Yalindag-Ozturk et al., 2011; Kreindler et al., 2014; Provancha-Romeo et al., 2017) (Table 3) and one conference paper abstract (Hathaway et al., 2014) (Table 4) also explored the use of integrative therapies in ICUs. Therapies used in these studies included lavender oil, garlic tablets, music, relaxation, guided imagery, massage using sweet almond oil scented with lavender and lemon, mind-body sessions, healing touch as well as acupuncture. Other therapies included reflexology, prayer and aromatherapy. All the articles reported positive outcomes when using integrative therapies in ICUs. The studies were conducted in general, cardiology, neonatal, as well as medical and surgical ICUs. The interventions were carried out by nurses working in ICUs, nurse researchers, acupuncturists, an occupational therapist as well as medical doctors.

Theme 2: Perceptions and attitudes of nurses on integrative therapies

Two quantitative studies (Hayes & Cox, 1999; Cooke et al., 2012) and one qualitative study (Anderson et al., 2016) examined the attitudes and perceptions of nurses towards the inclusion of integrative therapies in ICUs (Table 2). Both quantitative studies used exploratory descriptive surveys and revealed that most nurses (88% and 90.6%) were open to using integrative therapies in the ICU. The studies mentioned that challenges to the use of integrative therapies were lack of

knowledge and reluctance from other healthcare professionals working in ICUs. The studies named sources of knowledge on integrative therapies namely formal training, other providers, and the internet, amongst others. The qualitative study explored the perceptions of nurses in acute care. Nurses revealed that a particular integrative therapy known as healing touch was beneficial to both patients and nurses, enhancing holistic patient care. Nurses mentioned that lack of time and formal training was a barrier to the inclusion of healing hands in acute care.

Theme 3: General information on integrative therapies

From the articles, we identified four key areas of general information on integrative therapies, namely benefits and risks, ethical and legal aspects, challenges of incorporating integrative therapies and collaboration among healthcare professionals, patients and families.

Benefits and risks

A number of articles presented evidence that integrative therapies promote healing and enhance western medicine by addressing the body, mind and spirit of patients (Estores & Frye, 2015; Papathanassoglou & Park, 2016). Integrative therapies seem to improve the adverse experiences of critical illness among patients (Snyder & Niska, 2003). Benefits include improved sleep; reduced heart rate, respiratory rate and blood pressure; reduced anxiety and discomfort; as well as lower uptake of analgesics and sedatives (Brenner & Krenzer, 2003; Tracy & Chlan, 2011; Kramlich, 2014; Estores & Frye, 2015; Kramlich, 2016; Erdogan & Atik, 2017). Other benefits include fewer mechanical ventilation days, improved weaning from mechanical ventilation, patient satisfaction with care and reduced hospital costs (Papathanassoglou & Park, 2016). The use of integrative therapies promotes holistic and person-centred care in ICUs (Kramlich, 2014). Traditional Chinese medicine has been proven to be an effective treatment for septic shock in the ICU (Kramlich, 2016). Alternative materials used in ICUs resulted in positive outcomes, even though they are not classified as integrative therapies. For instance, ICUs with copper alloy surfaces experienced reduced rates of hospital acquired infections including methicillin-resistant *Staphylococcus aureus* or vancomycin-resistant *Enterococcus* colonization (Estores & Frye, 2015). Additionally, the use of silver hydrogel urethral catheters reduced symptomatic catheter-associated urinary tract infections (CAUTI) (Estores & Frye, 2015).

Articles mentioned that using integrative therapies in ICUs carried some risks. Herbal products may disturb normal physiological processes in the body such as glucose metabolism and blood coagulation (Kramlich, 2014). Additionally, herbal therapies may interact with western

pharmacotherapeutic agents causing adverse effects such as hemorrhage and hypoglycemia. In addition, some herbal products may potentiate the effects of corticosteroids when taken concomitantly (Kramlich, 2014), and may worsen pre-existing chronic illnesses (Kramlich, 2016). Moreover, patients' lack of knowledge on the adverse effects of integrative therapies may lead to admission in ICUs (Kramlich, 2014). Other risks include allergic reactions, possible mutagenic effects as well as errors in herbal identities (Young & Worswick, 2001).

Ethical and legal aspects

Some patients and their families do not disclose the use of integrative therapies to healthcare professionals. Reasons for non-disclosure include the following: lack of interest; perceptions that disclosure is irrelevant to western medicine; lack of inquiry from healthcare professionals; as well as patients anticipating that healthcare professionals will disapprove the use of integrative therapies (Kramlich, 2014). Healthcare professionals may lack formal and specific assessment tools for using integrative therapies, which may lead to the non-discussion with patients and their families (Kramlich, 2016). Integrative therapies may be provided by licensed, qualified practitioners of certain therapies such as acupuncture (Kramlich, 2014). Nurses who have received training in integrative therapies may provide them in ICUs, but within the acceptable ethical, legal and institutional ambits (Kramlich, 2017). Nurses need to be aware of their scope of practice and institutional policies to advocate and safely incorporate integrative therapies in ICUs, as any conflicts may lead to legal liability (Kramlich, 2017). Countries such as the United States of America, Canada, Germany and Australia have official regulatory bodies regarding the use of integrative therapies in healthcare (Young & Worswick, 2001).

Challenges of incorporating integrative therapies

The infrastructure in ICUs may limit the use of integrative therapies (Kramlich, 2014; Kramlich, 2016). For instance, patients may have many tubes and lines from technological devices that make it impossible to implement some integrative therapies such as aromatherapy massage (Snyder & Niska, 2003). Other therapies, such as music therapy may disturb other patients because most ICUs have no separate rooms for individual patients (Kramlich, 2014). Tracy and Chlan (2011) highlight that other challenges relating to the use of integrative therapies include lack of knowledge among healthcare professionals, lack of time due to the busy routines in ICUs, lack of resources as well as disapproval from other healthcare professionals (Disch & Kreitzer, 2003; Tracy & Lindquist, 2003; Tracy & Chlan, 2011). Some healthcare professionals may

perceive integrative therapies as being non-scientific or non-evidence based (Young & Worswick, 2001).

Collaboration among healthcare professionals, patients and families

Healthcare professionals should know about the benefits and risks of integrative therapies (Snyder & Niska, 2003; Disch & Kreitzer, 2003; Tracy & Lindquist, 2003). Healthcare professionals should also be compassionate towards the needs of patients and their families regarding the use of integrative therapies in ICUs (Estores & Frye, 2015). Healthcare professionals need to convey an attitude of acceptance, and openly communicate with patients and their families regarding their beliefs and preferences for healthcare, including if any integrative therapies are currently being used (Young & Worswick, 2001; Snyder & Niska, 2003; Kramlich, 2014). Doctors and nurses should discuss which integrative therapies are available in ICUs with patients and their families, and which specific therapies may be beneficial (Tracy & Chlan, 2011). Open communication enhances the assessment of patients and their families regarding their therapeutic preferences and goals, and builds healthy relationships between patients, family members and healthcare professionals (Kramlich, 2016).

DISCUSSION

To the best of our knowledge, this is the first scoping review of the literature on integrative therapies in ICUs. Integrative therapies included: guided imagery; aromatherapy using essential oils such as lavender; reflexology; massage; healing touch; music therapy; mind-body sessions; as well as garlic tablets. These therapies resulted in positive outcomes for patients managed in ICUs. For instance, acupuncture improved patients' respiratory status leading to successful weaning from mechanical ventilation (Matsumoto-Miyazaki et al., 2018), as well as improved blood pressure (Kreindler et al., 2014). Garlic tablets successfully treated urinary tract infections (Madineh et al., 2017) as well as multidrug resistant *Pseudomonas aeruginosa* pneumonia (Yalindag-Ozturk et al., 2011). These positive outcomes support the formal inclusion of integrative therapies in ICUs, especially those that improve patient outcomes. Therapies such as garlic tablets may be used to treat bacterial infections in ICUs since garlic is effective against both gram-negative and gram-positive bacteria as well as acid-fast bacteria such as Salmonella and Helicobacter (Madineh et al., 2017). Integrative therapies may reduce the incidence of hospital acquired infections in ICUs leading to reduced morbidity and mortality.

Our review also revealed a need for post-basic programs in integrative therapies for ICU nurses. Nurse licensing bodies and healthcare institutions need to recognize that patients can be managed using both western medicine and integrative therapies. Using combined treatment modalities requires that nurses be formally trained, especially in specialized treatments such as acupuncture. Alternatively, acupuncture can be provided by qualified acupuncturists in ICUs (Kreindler et al., 2014; Feeney et al. 2017; Matsumoto-Miyazaki et al., 2018). Understanding the value of integrative therapies and collaborating with practitioners of integrative therapies is necessary to achieve optimal patient care in ICUs (Provancha-Romeo et al., 2017). In essence, collaboration will further promote the use of integrative therapies in ICU.

While most of the articles that we reviewed reported beneficial outcomes of integrative therapies, there are patient safety concerns that must be considered. For instance, acupuncture encompasses the piercing of the skin using special needles and aromatherapy encompasses the application of essential oils on the skin (Estores & Frye, 2015). The special needles used for acupuncture may serve as agents for microbacterial invasion in already immunocompromised patients if infection control is not observed. The essential oils used in aromatherapy may cause adverse reactions on the skin of patients. Thus, healthcare professionals and practitioners of integrative therapies need to be vigilant by observing infection control practices and patient safety when incorporating integrative therapies in ICUs (Snyder & Niska, 2003).

From a qualitative perspective, ICU nurses were open to using integrative therapies possibly because they knew about these therapies from the internet, other healthcare professionals, journals, formal training and mass media (Cooke et al., 2012). The informal sources of information highlights the need for formal inclusion of integrative therapies into nursing education curricula in tertiary institutions. Formal training will allow nurses to learn about the potential adverse effects of these therapies, enabling them to monitor and assist in this regard. From the reviewed studies, nurses supported the use of these therapies because they promoted holistic patient care (Anderson et al., 2016). Although not recognized as an integrative therapy, our review revealed the potential benefits of using alternative materials in ICUs. An example observed was the reduction in CAUTI following the use of silver hydrogel urethral catheters (Estores & Frye, 2015). This highlights the need for healthcare professionals and administration to venture into safe and beneficial alternative therapeutic methods in a bid to improve ICU patient outcomes.

Strengths and limitations of the review

This is the first review of available literature on integrative therapies in intensive care units. Our review can thus be used a foundation for future research. We retrieved literature from diverse electronic databases. All the authors worked together to review the literature. Our review may be limited by the exclusion of non-English studies and grey literature. Based on the framework by Arksey and O'Malley (2005), we did not assess methodological qualities of the studies, hence, our findings cannot be generalized or transferred.

Future research

Our review revealed a need for empirical research exploring the use of integrated therapies and the effects thereof on patient outcomes in the ICU. The inclusion of integrative therapies into formal nursing curricula needs further clarification. Qualitative studies should explore the experiences of healthcare professionals regarding integrative therapies in ICUs in different cultural settings, especially in diverse African contexts. Most of the studies in this review have been conducted among nurses working in ICUs, thus the perceptions of other healthcare professionals should be explored.

CONCLUSION

In conclusion, this scoping review identified various aspects regarding using integrative therapies in ICUs. Key findings include interventions using integrative therapies, perceptions and attitudes of nurses as well as general information on integrative therapies. Integrative therapies have had positive outcomes among critically ill patients. In addition, ICU nurses have shown positive attitudes towards using integrative therapies in ICUs. These nurses feel that they do not know enough about these therapies and their benefits, signifying a need for formal education. Although integrative therapies have been shown to be beneficial, healthcare professionals need to consider certain patient safety concerns. The possibility of formulating policies and regulations on using these therapies in ICUs needs to be explored. On another note, healthcare professionals, patients and their families need to communicate openly regarding the use of integrative therapies in intensive care units. This will facilitate safe incorporation of integrative therapies in the plan of care, whenever the need arises.

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