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Research Article

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Nursing Innovation in Response to Health Challenges in Benin: Integrating Local Pharmacopoeia and Indigenous Knowledge into the Transcultural Management of Pain

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Abstract

Introduction: *In Benin, nursing pain management faces economic and logistical constraints that limit access to conventional analgesics, while a rich phytotherapeutic heritage remains largely excluded from official hospital protocols. This exclusion runs counter to the international movement promoted by the WHO Global Traditional Medicine Strategy 2025-2034, which calls for the safe, evidence-based integration of these resources into health systems.*

Objective: *To examine the role of nursing research in the scientific valorisation of Beninese indigenous knowledge involving lemongrass, turmeric, ginger, and castor, and to propose pathways for their safe integration into nursing care, drawing on Madeleine Leininger's transcultural care theory.*

Methods: *A descriptive and exploratory practice-innovation study combining an updated scientific literature review (PubMed, Google Scholar, 2022-2025), fieldwork in hospital and community settings, and modelling of a hybrid castor-leaf/olive-oil poultice protocol.*

Results: *The literature, including the most recent meta-analyses, confirms clinically relevant anti-inflammatory and analgesic properties for these four plants, with efficacy comparable to non-steroidal anti-inflammatory drugs in several indications (knee osteoarthritis, primary dysmenorrhea, and muscle pain).*

Conclusion: *A reasoned hybridisation of local pharmacopoeia and nursing care, framed by strict safety criteria and aligned with international and continental orientations on traditional medicine, is a promising pathway for strengthening health sovereignty and the therapeutic alliance in Benin.*

Keywords: Indigenous knowledge, Transcultural Care, Nursing Process, Pain Management, Beninese Pharmacopoeia, Traditional Medicine, Ricinus Communis, Zingiber Officinale, Curcuma Longa

1. Introduction

1.1 An International Context in Transition

The use of traditional medicine is neither a marginal phenomenon nor a feature specific to low- and middle-income countries: the World Health Organization (WHO) estimates that more than 80% of the world's population, distributed across more than 170 of its 194 Member States, currently uses some form of traditional, complementary, or integrative medicine (TCIM) [1]. This situation led the 78th World Health Assembly to adopt, in 2025, the WHO Global Traditional Medicine Strategy 2025-2034, which sets four guiding objectives: strengthen the scientific evidence base, ensure the safety and regulation of practices, integrate TCIM into health systems, and promote their cross-sectoral contribution [2]. This strategy followed the first Global Traditional Medicine Summit, organised by WHO in India in August 2023, which explicitly called for evidence-based integration rather than recognition based solely on cultural grounds [3]. However, this international movement is not without tensions: several delegations, particularly from Europe, highlighted the risk of practices with limited documentation being validated too quickly, while civil-society organisations instead criticised a strategy still overly shaped by Western evidence standards to the detriment of indigenous epistemologies [4].

1.2 The African Continental Shift

In Africa, traditional medicine is not a marginal alternative to biomedicine but, for a majority of the population, an effective entry point into the healthcare system: the WHO Regional Office for Africa estimates that between 70% and 80% of the continent's population uses it for primary healthcare needs, with plant-based treatments being the most widespread form [5]. This reality has fuelled a recent continental institutional dynamic: in February 2026, the East African Forum on traditional, complementary and integrative medicines, held in Nairobi, adopted joint resolutions to integrate these practices into national health systems, in line with the WHO Global Strategy; two months later, the World Health Summit regional meeting, also held in Nairobi, reaffirmed the role of traditional medicine as a pillar of primary healthcare and universal health coverage in Africa [6,7]. A critical review published after the 2023 Global Summit nevertheless notes that this political momentum faces structural obstacles common to most African countries: lack of a harmonised regulatory framework, insufficient training of health professionals in local pharmacopoeia, risk of misappropriation of indigenous knowledge in the absence of intellectual-property protection, and lack of research methodologies adapted to the specific features of TCIM [3]. These observations, formulated at the continental level, directly resonate with the West African and Beninese context described below.

1.3 West Africa and the Beninese Specificity

In Benin, the institutionalisation of traditional medicine is longstanding in comparison with the continent: Decree No. 2001-036 of 15 February 2001 sets out the ethical principles and conditions for practising traditional medicine, and the national policy for promoting and integrating pharmacopoeia and traditional medicine into the national health system was adopted as early as 2002 and has since been implemented by the National Programme for Pharmacopoeia and Traditional Medicine (PNPMT) [8]. According to data from this programme, between 80% and 85% of the Beninese population currently uses traditional medicine for their healthcare needs, a proportion consistent with the continental and East African estimates mentioned above (Figure 2). This practice is based on a documented and diverse ethnobotanical heritage: a study conducted in 2023 in the municipality of Adjarra, southern Benin, identified 84 plant species used by 47 herbalists and 12 traditional healers interviewed, with patient questioning remaining the main reported diagnostic method [9]. The same study emphasises that knowledge transmission remains largely hereditary, exposing this heritage to a risk of generational erosion if no documentation and scientific validation process is undertaken, a finding that directly supports the valorisation approach undertaken in this article.

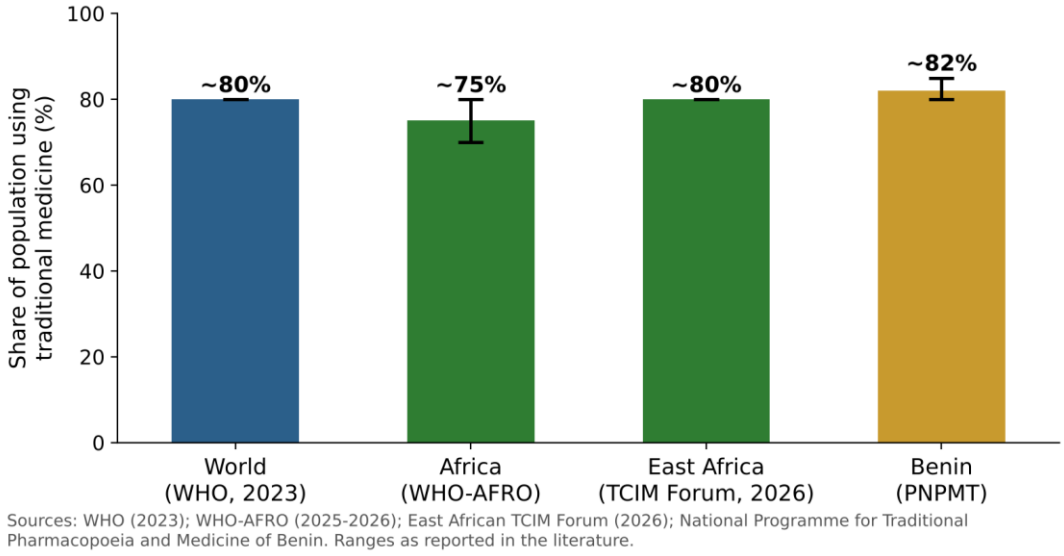


Figure 2 : Use of Traditional Medicine by Geographic Scale

1.4 Pain as a Daily Problem in Beninese Nursing Practice

It is within this favourable institutional context, which remains only partially operationalised at the patient's bedside, that the specific issue of nursing pain management arises. In daily nursing practice in Benin, pain management is a constant concern. Although the modern therapeutic arsenal remains essential, it sometimes faces financial or availability limitations, particularly in peripheral health facilities. Yet Benin's plant heritage contains resources with established traditional uses: lemongrass (Cymbopogon citratus), turmeric (Curcuma longa), and ginger (Zingiber officinale) are already embedded in health practices for their sedative and anti-inflammatory properties. More specifically, indigenous topical techniques, such as the application of castor leaves (Ricinus communis) combined with olive oil, are recognised for their effectiveness against inflammatory and joint pain [10]. These forms of knowledge nevertheless often remain outside hospitals, widening the gap between official nursing practices and patients' cultural realities; this exclusion of local resources not only limits the resilience of the healthcare system but also weakens the therapeutic alliance between nurses and Beninese patients.

1.5 Conceptual Framework and Research Question

How, then, can nurses in Benin innovate by scientifically integrating these plants and local techniques into their nursing care process? How can we move from simple recognition of tradition to a validated transcultural approach that enables pain management to be effective, affordable, and safe? This question finds its conceptual framework in Madeleine Leininger's transcultural care theory, which invites healthcare professionals to base care on recognition of patients' belief systems and practices rather than systematically replacing them with Western biomedicine, a framework that a recent review identifies as a structuring reference for cultural-competence education in nursing [11].

1.6 Objectives

- To valorise Beninese indigenous knowledge by linking three levels of analysis - international, continental, and national - with clinical field realities.
- To analyse the pharmacological properties of lemongrass, turmeric, ginger, and castor.
- To propose pathways for the safe integration of these remedies, particularly the castor-leaf/olive-oil poultice, into care protocols.
- To show how this therapeutic hybridisation constitutes an innovation for Benin's health sovereignty, in line with WHO orientations at the global and continental levels.

2 Methodology

This study adopts a mixed approach, combining an updated scientific literature review, fieldwork, and a phase of care-protocol modelling.

2.1 Study Design

This is a descriptive and exploratory study aimed at practice innovation, seeking to bridge ethnobotany (traditional knowledge) and nursing science (clinical application), and to situate this approach within international (WHO) and continental (Africa, West Africa) reference frameworks for traditional medicine.

2.2 Study Setting and Population

The study was conducted in two complementary settings in Benin:

- Hospital setting: interviews with nurses in surgery and rheumatology departments to assess their attitudes toward pain and indigenous knowledge;
- Community setting: meetings with recognised traditional practitioners and herbalists to identify traditional preparation methods for the plants studied (lemongrass, turmeric, ginger, castor).

2.3 Data Collection Procedure

Data collection took place in three phases:

- Botanical inventory phase: systematic identification of local species (for example, distinguishing green castor from purple castor for leaf use);
- Qualitative survey phase: semi-structured interviews focusing on cultural representations of pain and barriers to integrating the pharmacopoeia (lack of training, concerns about toxicity);
- Pharmacological review phase: analysis of active compounds (curcumin, gingerol, ricinoleic acid) using the PubMed and Google Scholar scientific databases;

2.4 Modelling of the 'Hybrid' Protocol

For the specific innovation involving the castor-leaf/olive-oil poultice, the methodology followed the steps of the nursing care process:

- Preparation standardisation: defining the heating temperature of the leaves and the purity of the olive oil;
- Inclusion and exclusion criteria: eligible patients (for example, chronic joint pain) and contraindications (open wounds, known allergies);
- Evaluation indicators: use of the visual analogue scale (VAS) to measure pain intensity before and after application.

The chronological details of this protocol are presented in Figure 5.

2.5 Ethical Considerations

- Consent: all data were collected with the participants' free and informed consent;
- Intellectual property: respect for indigenous knowledge, avoiding disclosure of family secrets or rituals unrelated to publicly practised care, an issue that recent continental literature explicitly identifies as a major risk of undue appropriation of indigenous knowledge [3];
- Safety: the proposed protocol respects the principle 'Primum non nocere' (first, do no harm), ensuring the absence of major drug interactions.

2.6 Data Analysis

Qualitative data underwent thematic analysis to identify levers for health sovereignty, while observational pain data were processed to assess the clinical relevance of the proposed hybridisation. The level of evidence for each source used was assessed according to

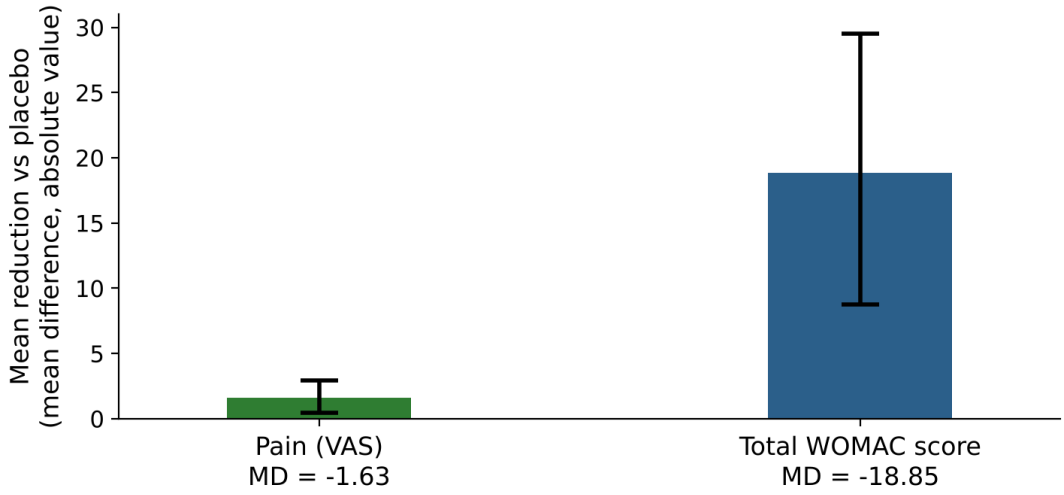
the Oxford Centre for Evidence-Based Medicine framework, with the aim of explicit evidence grading (see Table 2).

3 Results

The literature review confirms clinically relevant pharmacological properties for each of the four plants studied in pain management. The following paragraphs present the results plant by plant, systematically incorporating data published between 2022 and 2025.

3.1 Turmeric (Curcuma Longa)

The principal active compound in turmeric is curcumin, whose mechanism of action is based on inhibition of inflammatory pathways in the body, thereby reducing pain perception. A multicentre trial demonstrated efficacy comparable to ibuprofen in the treatment of knee osteoarthritis, with better gastrointestinal tolerability [12]. This conclusion was confirmed and refined by two recent studies: a meta-analysis of randomised controlled trials concluded that curcuminoids significantly reduce pain and improve function, while a Bayesian network meta-analysis published in 2024 precisely quantified the effect compared with placebo: a mean difference of -1.63 points on the visual analogue pain scale (95% CI: -2.91 to -0.45) and -18.85 points on the total WOMAC score (95% CI: -29.53 to -8.76) (Figure 3) [13,14].



Source: Zhao J, et al. Efficacy and safety of curcumin therapy for knee osteoarthritis: a Bayesian network meta-analysis. J Ethnopharmacol. 2024;321:117493. 95% CI shown by error bars.

Figure 3 : Effect of Turmeric on Pain and Function in Knee Osteoarthritis (Bayesian meta-analysis, 2024)

3.2 Ginger (Zingiber officinale)

Ginger exerts a powerful analgesic action through its active compounds, gingerol and shogaol, which are effective for muscle and joint pain.

3.2.1 Dysmenorrhea (Painful Menstruation)

Ginger is a promising alternative to conventional treatments for moderate to severe primary dysmenorrhea. All available trials (six trials, 687 patients) confirm efficacy superior to placebo and considered comparable to conventional NSAIDs such as ibuprofen or mefenamic acid [15-18]. The standard protocol uses 750 to 2,000 mg of powder per day, ideally during the first three days of menstruation, with ginger acting by inhibiting prostaglandin synthesis responsible for painful uterine contractions.

3.2.2 Muscle Pain (Soreness)

Ginger use facilitates recovery after intense or unaccustomed physical exercise: supplementation with 4 g/day accelerates recovery of muscle strength, while intake of 2 g/day reduces inflammation and pain 24 hours after exercise [10,19]. Topically, a cream containing 14% Zingiber cassumunar effectively reduces muscle tenderness [20].

3.2.3 Knee Osteoarthritis (Gonarthrosis)

Results are more heterogeneous for this chronic condition: oral administration (1 g/day) shows variable benefits across studies, whereas topical application (gels, massage oils) appears effective in the short term. Combined with turmeric and glucosamine, ginger produces positive results with fewer gastric side effects than diclofenac.

3.2.4 Chronic Low Back Pain and Migraine

Swedish massage with ginger oil appears more effective than traditional Thai massage for reducing pain and disability in older adults with low back pain [21]. A pilot study also suggests that a sublingual formulation combining feverfew and ginger is a safe and effective treatment for aborting migraine attacks at the onset of the first symptoms [22].

Summary of mechanism of action: ginger acts as a natural anti-inflammatory agent: it inhibits COX-1 and COX-2 enzymes, similarly to some medicines, and blocks the production of leukotrienes and pro-inflammatory cytokines, thereby reducing sensitisation of pain receptors (Dedov et al., 2002; Ahn et al., 2009) [23,24].

3.3 Lemongrass (Cymbopogon Citratus)

Lemongrass has sedative and antispasmodic properties, particularly indicated for pain accompanied by anxiety. A recent review of the ethnobotany, phytochemistry, and biological activities of the genus Cymbopogon confirms consistency between traditional uses and available pharmacological data, particularly regarding the plant's anti-inflammatory and antioxidant properties [25]. Regarding anxiolytic effects, a trial involving 128 participants demonstrated a measurable anxiolytic effect of lemongrass essential oil, attributed to modulation of the GABAergic system [26]. Regarding analgesic effects, a recent experimental study showed that Cymbopogon citratus extract reduced abdominal contractions and uterine inflammation in an animal model of primary dysmenorrhea, with analgesic efficacy considered comparable to ibuprofen in several nociceptive tests [27]. These recent studies strengthen, through controlled experimental methods, a use that had previously been documented mainly by popular sources.

3.4 Castor (Ricinus Communis)

Ricinus communis is a medicinal and industrial plant of the Euphorbiaceae family, widely distributed in tropical and subtropical regions of Africa, Asia, and the Americas. Native to tropical Africa and Ethiopia, it is now cultivated particularly in India, China, and Brazil for castor-oil production. The seeds are the main source of oil used in pharmaceutical, cosmetic, agricultural, and industrial fields. Since antiquity, different parts of the castor plant (seeds, leaves, roots, fruits, and oil) have been used in traditional medicine to treat various conditions: constipation, inflammation, skin infections, rheumatic pain, digestive disorders, oedema, dermatological conditions, and pain associated with childbirth. Castor oil is particularly recognised for its laxative, purgative, anti-inflammatory, and analgesic properties. A recent systematic review covering pharmacology through clinical studies confirms the plant's analgesic and anti-inflammatory potential and identifies alkaloids, flavonoids, coumarins, terpenoids, sterols, and fatty acids as the main phytochemical groups responsible for this activity, with antinociceptive, antiasthmatic, and hepatoprotective properties documented in vitro, in vivo, and clinically [28].

The biological properties of castor are related to its richness in bioactive phytochemicals - ricinine, ricin, ricinoleic acid, gallic acid, quercetin, kaempferol, flavonoids, alkaloids, tannins, terpenes, and saponins - to which antibacterial, antifungal, antioxidant, anti-inflammatory, antidiabetic, analgesic, anticonvulsant, and wound-healing effects are attributed [29]. The leaves contain, in particular, alkaloids (including ricinine) with documented central analgesic activity, and topical application of castor oil is associated with reduced swelling and inflammatory pain. Documented traditional uses: dermatology (dermatitis, ringworm, warts, dandruff); rheumatism, headaches, and oedema; maternity (stimulation of lactation and support during labour).

Precaution of use: castor oil should be used cautiously for therapeutic purposes to avoid its unwanted purgative effect; ingestion of the seeds produces ricin, a highly toxic protein whose exposure can cause severe digestive, respiratory, hepatic, and renal disorders [30].

The major innovation of this work lies in standardising the castor-leaf/olive-oil poultice: the latter acts as a lipid-soluble carrier facilitating passage of the leaf's active compounds through the skin barrier. The proposed protocol defines an exposure time of 45 minutes and a warm application temperature to optimise local vasodilation without risk of burns (chronology detailed in Figure 5, Section 4.3).

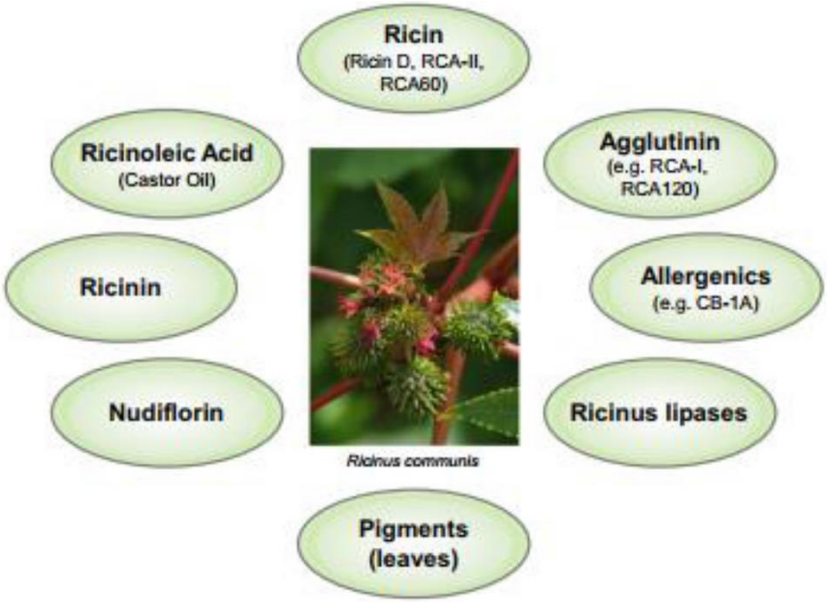


Figure 1 : Main Bioactive Compounds of Castor (Ricinus Communis)

Source: iconographic synthesis based on the literature review (see Section 3.4, refs. [27,29]).

Plant	Main use	Pharmacological comparator	Dosage studied	Key reference(s) (2022-2025 in bold)
Turmeric (Curcuma longa)	Chronic inflammation / osteoarthritis	Ibuprofen, diclofenac	1,500 mg/day of curcuminoid extract; 250 mg/day (low-dose extract)	Kuptniratsaikul et al., 2014; Feng et al., 2022; Zhao et al., 2024
Ginger (Zingiber officinale)	Arthritis / menstrual cramps	Ibuprofen, conventional analgesics	750-2,000 mg/day (powder)	Ozgoli et al., 2009; Rahnama et al., 2012; Jenabi, 2013; Shirvani et al., 2017
Lemongrass (Cymbopogon citratus)	Anxiety / mild inflammatory skin pain, dysmenorrhoea	Mild anxiolytics; ibuprofen (experimental model)	Essential oil (aromatherapy); extract 30-300 mg/kg (animal study)	Alvarado-García et al., 2023; Sidiq et al., 2025; Zhao et al., 2024
Ricin (huile/feuilles, usage topique)	Douleur articulaire / inflammation cutanée	Capsaïcine (usage topique)	Application en cataplasme ou massage ; feuilles chauffées + huile d'olive	Vieira et al., 2000 ; StatPearls, 2023 ; Gupta et al., 2024
Castor (oil/leaves, topical use)	Joint pain / skin inflammation	Capsaicin (topical use)	Application as a poultice or massage; heated leaves + olive oil	Vieira et al., 2000; StatPearls, 2023; Gupta et al., 2024

Table 1 : Comparison of the Four Medicinal Plants for Anti-Inflammatory and Analgesic Purposes

Plant	Main indication	Dominant type of evidence	Oxford CEBM level (approximate)
Turmeric	Knee osteoarthritis	Meta-analyses of randomised controlled trials (including Bayesian network, 2024)	Level 1 (strong evidence)
Ginger	Primary dysmenorrhoea	Synthesis of 6 randomised controlled trials (687 patients)	Level 1-2 (strong to moderate evidence)
Ginger	Post-exercise muscle pain	Isolated randomised controlled trials	Level 2 (moderate evidence)
Lemongrass	Anxiety associated with pain	Pre-post experimental trial (128 participants)	Level 2-3 (moderate evidence)
Lemongrass	Primary dysmenorrhoea	Controlled animal experimental study (2025)	Level 4-5 (preclinical evidence)
Castor	Topical inflammatory pain	Pharmacological review and preclinical studies; documented traditional topical use	Level 4-5 (preclinical evidence / traditional use)

Table 2 : Level of Scientific Evidence by Plant and Indication (Oxford Cebm Framework)

Indicative classification established by the authors from the references cited in Sections 3.1 to 3.4, according to the evidence-level frameworks of the Oxford Centre for Evidence-Based Medicine and PRISMA recommendations.

Plant	Main precautions	Contraindications
Turmeric	Digestive tolerance generally good; caution when combined with anticoagulants	Gallstones, obstruction of the bile ducts
Ginger	Cumulative dose to be monitored (>2 g/day); use with caution in late pregnancy	Coagulation disorders, scheduled surgery soon
Lemongrass	Mandatory dilution of the essential oil before skin application	Known allergy to Poaceae; uncontrolled use in pregnant women
Castor	Topical use of the leaves documented as generally safe; never ingest raw seeds	Open wounds, known allergy, seed ingestion (ricin toxicity)

Table 4 : Safety and Contraindication Framework by Plant and Route of Use

4. Discussion

4.1 Summary of Results and Consistency with the International Literature

The results confirm that the four plants studied have clinically documented pharmacological properties, with, for some indications, efficacy comparable to that of reference non-steroidal anti-inflammatory drugs. This finding, already established by the foundational studies cited in Section 3, is supported by the most recent literature: the 2024 Brazilian meta-analysis on turmeric and the 2024 systematic review on the analgesic potential of castor provide a quantitative level of evidence that earlier, more qualitative literature could not achieve [14,28]. This finding supports the hypothesis that Beninese indigenous knowledge is not merely a cultural belief, but constitutes a complementary therapeutic resource that can be mobilised within a rigorous nursing-care approach, a conclusion that directly aligns with the objectives of the WHO Global Traditional Medicine Strategy 2025-2034 regarding strengthening the scientific evidence base [2].

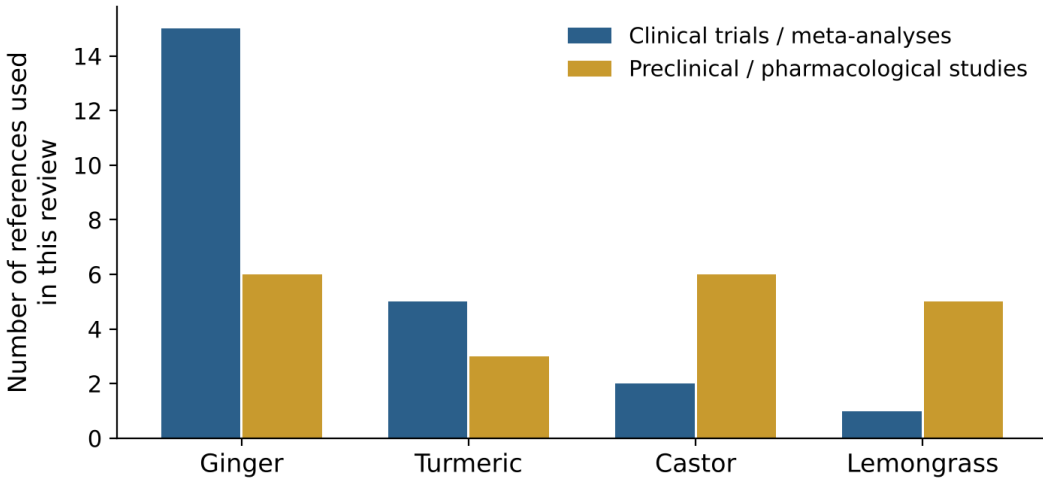
4.2 Leininger's Transcultural Theory

This work builds on Madeleine Leininger's transcultural care theory, which encourages healthcare professionals to base care on recognition of patients' belief systems and practices rather than their systematic replacement with Western biomedicine. A recent review of cultural-competence training in nursing notes that, more than sixty years after its formulation, this framework remains a structuring reference for cultural-competence education while calling for continued updating through engagement with diverse clinical contexts [11]. In this sense, the hybrid castor-leaf/olive-

oil poultice protocol proposed here illustrates a concrete pathway for reconciling modern protocols and traditional practices, directly addressing the study's initial research problem.

4.3 From Local Knowledge to Scientific Evidence: An Explicit Evidence Hierarchy

Comparison of the four plants studied reveals substantial heterogeneity in the volume and type of available evidence (Table 2, Figure 4). Ginger has by far the broadest clinical evidence base, with several randomised controlled trials and syntheses involving hundreds of patients; turmeric now has network meta-analyses with good methodological quality; lemongrass and castor, by contrast, still rely mainly on preclinical studies or small trials, despite recent publications that have strengthened their scientific credibility. This asymmetry should be explicitly acknowledged in all nursing education on local pharmacopoeia rather than being obscured in the name of uniform valorisation of the four plants.



Source: count of the references cited in the Results section of this article, by plant and by type of evidence (indicative classification, non-exhaustive).

Figure 4 : Relative Volume of Clinical and Preclinical Evidence Used for Each Plant in This Literature Review

The hybrid castor-leaf/olive-oil poultice protocol presented in Section 2.4 illustrates how this evidence hierarchy can be translated into a standardised and safe care procedure (Tables 3 and 4). The olive oil acts as a lipid-soluble carrier, while control of exposure time and temperature aims to optimise the therapeutic effect without causing skin injury (Figure 5).

Plant	Main active compound(s)	Proposed mechanism of action
Turmeric	Curcumin	Inhibition of inflammatory pathways (NF-κB, pro-inflammatory cytokines); reduction of the perception of joint pain.
Ginger	Gingerol, shogaol	Inhibition of the COX-1/COX-2 enzymes; blocking of the production of leukotrienes and cytokines; reduction of the sensitisation of pain receptors.
Lemongrass	Citral, geraniol, myrcene	Modulation of the GABAergic system (anxiolytic effect); inhibition of the COX/5-LOX enzymes; antioxidant and uterine-relaxing action.
Castor	Ricinine, ricinoleic acid, flavonoids (quercetin, kaempferol)	Central antinociceptive activity (alkaloids); topical anti-inflammatory effect (ricinoleic acid); liposoluble vehicle via the associated olive oil.

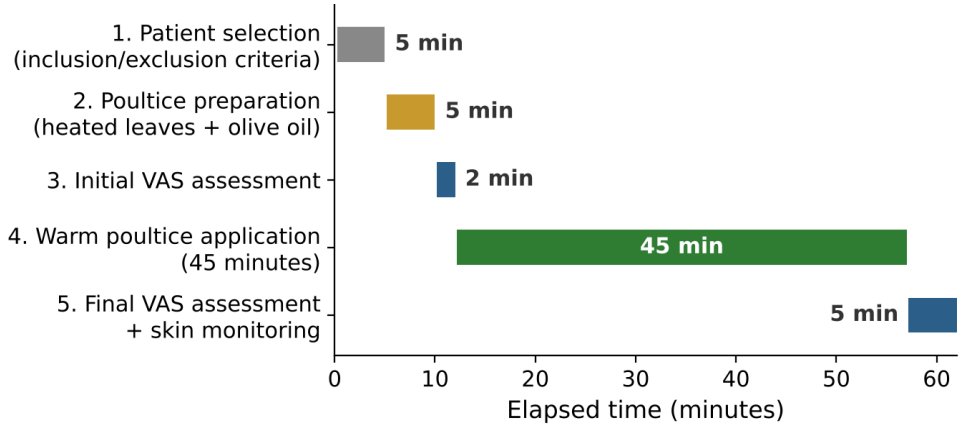
Table 3 : Bioactive Compounds and Proposed Mechanisms of Action by Plant

4.4 Methodological Limitations

Several limitations should nevertheless be highlighted. First, the literature used remains heterogeneous, combining randomised controlled trials, recent meta-analyses, observational studies, animal models, and, particularly for lemongrass, popular sources with more limited reliability; the studies published between 2022 and 2025 included in this version of the article partially reduce, but do not eliminate, this heterogeneity, which calls for explicit evidence-level grading in accordance with the Oxford CEBM frameworks already presented in Table 2. Second, the potential toxicity of castor, particularly related to ricin contained in the seeds, requires a strict distinction between topical use of the leaves, documented as generally safe, and ingestion of seeds or crude oil, which poses a real toxic risk. This distinction must be explicitly incorporated into all nursing staff training (Table 4).

Parameter	Criterion adopted
Raw material	Fresh castor leaves (distinction between green castor / purple castor), pure olive oil
Preparation	Controlled heating of the leaves; combination with olive oil as a liposoluble vehicle
Method of application	Poultice applied warm to the skin, never by the oral route
Exposure duration	45 minutes, warm temperature (VAS assessment before/after application)
Indications adopted	Chronic joint pain, localised inflammatory pain
Contraindications	Open wounds, known allergies to castor or olive oil
Specific risk to rule out	Ingestion of seeds or raw oil (toxicity linked to ricin) — strictly topical use of the leaves
Monitoring	Skin check after application; reassessment of the VAS

Table 4 : Standardisation and Safety Criteria for the Hybrid Castor-Leaf/Olive-Oil Poultice Protocol



Source: modelling of the protocol proposed in this study (section 2.4).

Figure 5 : Standardised Chronology of The Hybrid Castor-Leaf/Olive-Oil Poultice Protocol

4.5 Practical Implications for Nursing Care in Benin and West Africa

In practical terms, integrating this knowledge requires overcoming barriers identified during fieldwork: insufficient staff training, fear of toxicity, and rigidity of hospital protocols. These obstacles are not unique to Benin: the continental review published after the 2023 Global Traditional Medicine Summit identifies the same constraints - lack of a harmonised regulatory framework, insufficient training of health professionals, and risk of appropriation of indigenous knowledge across Africa as a whole [3]. Benin nevertheless has a comparative advantage: an established legal framework (2001 decree, 2002 national policy) and a dedicated national programme (PNPMT), providing an institutional basis on which to build structured nursing education in local pharmacopoeia [8]. A pain-assessment grid incorporating cultural indicators, combined with continuing training of nurses in local pharmacopoeia, could provide a realistic lever for practice change without compromising patient safety or respect for the principle 'Primum non nocere'.

4.6 Sustainability and Health Sovereignty

Finally, this therapeutic hybridisation has implications for the sustainability of the Beninese health system: for mild to moderate pain, it may reduce exclusive dependence on chemical analgesics that can be costly or subject to supply shortages, while valuing local resources and strengthening the therapeutic alliance between healthcare professionals and patients. This orientation forms part of a broader dynamic: recent continental mobilisation in favour of integrating traditional medicines - whether through the 2026 resolutions of the East African Forum or recommendations arising from the Nairobi regional summit in the same year - suggests that strong institutional anchoring of the approach proposed here, at the Beninese level, could eventually form part of a wider West African regional movement for the scientific valorisation of local pharmacopoeias [6,7].

5. Conclusion

Scientific valorisation of Beninese indigenous knowledge concerning lemongrass, turmeric, ginger, and castor opens a concrete pathway for innovation in nursing practice for pain management. By drawing on the nursing care process and the conceptual framework of transcultural care, nurses can act as mediators between modern protocols and traditional practices, provided that strict safety, indication, and contraindication criteria are respected. This local approach is not isolated: it is consistent with the WHO Global Traditional Medicine Strategy 2025-2034 at the international level, with the integration dynamic promoted by African regional institutions, and with the Beninese national legal framework in force since 2001. The hybrid castor-leaf/olive-

oil poultice protocol standardised in this study represents a first reproducible step toward this therapeutic hybridisation. However, additional clinical trials conducted directly in the Beninese context remain necessary to confirm the efficacy and safety of this protocol on a larger scale and to support wider use in care settings.

Declarations

Conflicts of interest: none related to this work.

Funding: this study received no specific external funding.

Contributions:

- Olympe GBEVO: study conception, data collection and analysis, and manuscript drafting
- Edouard KARAGI: study conception, data collection and analysis, and manuscript drafting
- Erick BAKENGA: data analysis
- Schedrac BONOU: data analysis
- Rodrigue ONI: data analysis
- Kossa SABI: data analysis and manuscript validation
- Jacques VIGAN: data analysis and manuscript validation

Ethical considerations: free and informed consent from participants; respect for the confidentiality of indigenous knowledge not intended for public disclosure.

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