Perception and Attitude of Nurses Towards the Use of Non-Pharmacological Interventions in Chronic Pain Management among Orthopedic Patients in UNIOSUN Teaching Hospital

[1]Adesina, K.A, [2]Olawale G.B, [3]Adelabu, S. A., [4]Odesanya L.O & [5]Adeniyi V. A.
[1]Faculty of Nursing Sciences, Osun State University, Osogbo, Nigeria
[2] Faculty of Nursing Sciences, Osun State University, Osogbo, Nigeria
[3] Faculty of Nursing Sciences, Osun State University Teaching Hospital, Osogbo, Nigeria
[4] Faculty of Nursing Sciences, Osun State University, Osogbo, Nigeria
[5] Faculty of Nursing Sciences, Osun State University, Osogbo, Nigeria

Corresponding Author
Kamoru A. Adesina (RN, RPON, MSc PhD)
Faculty of Nursing Sciences, Osun State University,
Osogbo, Nigeria, Email: kamoru.adesina@uniosun.edu.ng
Mobile: +2348035368642

Abstract
Chronic pain is a persistent condition that significantly affects the quality of life and functionality of orthopedic patients. Non-pharmacological interventions (NPIs) serve as vital complementary approaches to pharmacological methods in pain management. Nurses play a central role in the implementation of NPIs, and their perceptions and attitudes are critical to the effective integration of these methods into clinical practice. This study aims to assess the perception and attitude of nurses towards the use of NPIs in chronic pain management among orthopedic patients, determine the prevalence of NPI use, and identify the most common types employed. A descriptive cross-sectional study was conducted among 178 nurses at UNIOSUN Teaching Hospital, Osogbo. Participants were selected using convenience sampling. Data were collected using a validated structured questionnaire and analyzed using SPSS version 25. Ethical clearance was obtained and informed consent was secured from all respondents. The study found that (53.93%) of the nurses had a good perception of NPIs, while 50% demonstrated a favorable attitude. The prevalence of NPI usage was high at (51.69%). Positioning and physical therapy/exercise programmes were the most commonly utilized NPIs. While the perception and attitude of nurses toward NPIs were generally positive, several barriers such as inadequate resources and lack of formal training limit their practical application. It is recommended that healthcare facilities provide adequate support, including training and resources, to enhance the effective use of NPIs in chronic pain management.

Keywords: Attitude, Chronic pain, Non-pharmacological interventions, Nurses,

Introduction

Chronic pain, particularly those affecting orthopedic patients, is the main contributor to disability worldwide (Vos *et al.,* 2017). It is a prevalent and debilitating condition that affects millions of people worldwide, not excluding orthopedic patients (Gupta,2023). According to the World Health Organization, about 1.75 billion people worldwide experience chronic musculoskeletal pain (WHO,2020). Chronic pain is a complex condition that persists for an extended period, typically more than three months, and is linked to a significant level of emotional distress and/ or functional impairment (Nicholas *et al*., 2019).

Chronic pain is a significant public health issue that adds significantly to the costs of disability insurance and healthcare systems (El-Tallaway *et al*., 2021). A person's quality of life is greatly reduced as a result of chronic pain affecting the musculoskeletal system, which increases suffering during day-to-day activities, frequency of sick leave, and disability pensions (El-Tallaway *et al*.,2021). There is a wide range of musculoskeletal conditions that cause chronic pain, which affect the bones, joints, ligaments, and tendons, significantly impacting the quality of life, which include arthritis, debilitating back pain, joint replacements, are conditions that cause an individual to develop chronic pain (Williams *et al*.,2018).

Traditionally, chronic pain management has relied heavily on pharmacological methods, particularly opioids and NSAIDs (Morelli, 2021; Nomikos *et al*., 2022). However, concerns over addiction, adverse effects, and long-term efficacy have shifted attention towards non-pharmacological interventions (Gupta, 2023). NPIs include a wide range of therapies such as physical therapy, massage, cognitive-behavioral therapy, and spiritual interventions like music and Qur'anic recitation (Abdollahyar *et al*., 2019; El Geziry *et al*., 2018).

Nurses, as primary caregivers, are key players in the administration of NPIs (Mallick-Searle et al., 2021). Their perception and attitude towards these methods significantly influence their application in clinical settings. However, barriers such as lack of training, limited institutional support, and insufficient resources can hinder effective use.

However, despite the growing evidence for non-pharmacological interventions and the crucial role of nurses, research exploring their perception and attitude towards these interventions in the context of orthopedic pain management remains limited. This

study aims to assess the perception and attitude of nurses towards the use of NPIs in chronic pain management among orthopedic patients at UNIOSUN Teaching Hospital, Osogbo.

Methodology

Study Design and Setting: A descriptive cross-sectional study was conducted at Uniosun Teaching Hospital, Osogbo, a tertiary healthcare facility in Osun State, Nigeria.

Population and Sample Size: The target population comprised registered nurses working in the orthopedic wards. The sample size was calculated using Taro Yamane's formula, yielding a total of 178 respondents selected through convenience sampling. The sample size included registered nurses working in orthopedic unit and were ready to fill questionnaires, while nurses on leave during the study period or those unwilling to participate were excluded.

Data Collection Instrument: A structured questionnaire with five sections: socio-demographic data, perception, attitude, prevalence and the prevalent types of NPIs used in management of chronic pain among orthopedic patients. The instrument was validated by experts and tested for reliability.

Data Collection Procedure: Questionnaires were self-administered to respondents after informed consent and ethical approval was obtained.

Data Analysis: Data were analyzed using Statistical Package of Social Sciences (SPSS) version 25. Descriptive statistics summarized demographics variables, (frequencies, percentages, means) while chi-square tests determined associations between variables at $p<0.05$.

Ethical Considerations: Ethical approval was obtained from the Research Ethics Committee of UNIOSUN Teaching Hospital. Informed consent was obtained from all participants, ensuring confidentiality and voluntary participation.

Results

Table 1: Socio-demographics characteristics of respondents

Socio-Demographic Characteristics	Sub-Variable	Frequency (N=178)	Percentage (%)
Age	Less than 25	6	3.4
	25-29	70	39.3
	30-34	30	16.9
	35-39	46	25.8
	Greater than 40	26	14.6
Gender	Male	33	18.5
	Female	145	81.5
Educational Level	Diploma	14	7.9
	BNSc	101	56.7
	MSc	46	25.8
	PhD	17	9.6
Years Of Experience	1-5years	124	69.7
	6-10years	31	17.4
	11-15years	11	6.2
	16years and above	12	6.7

The majority of respondents are in the 25-29 age range, with 70 respondents (39.3%). Educational attainment shows a noteworthy of 101(56.7%) with B.NSc. holder and the dominant gender among the respondents are female, with 145(81.5%). Majority 124(69.7%) of the respondents had 1-5 years of experience

Research Question 1: What is the perception of nurses towards the use of non-pharmacological interventions?

Table 2: Perception of Nurses towards the Use of NPIs (N=178)

Variables	SA	A	N	D	SD
Non-pharmacological	30(16.9%)	107(60.1%)	10(5.6%)	18(10.1%)	13(7.3%)

interventions can be effective in managing chronic pain in orthopedic patients.					
I am confident in using non-pharmacological interventions for pain management.	29(16.3%)	102(57.3%)	24(13.5%)	2(1.1%)	21(11.8%)
There is a wide range of non-pharmacological interventions available for chronic pain management	42(23.6%)	105(59.0%)	12(6.7%)	5(2.8%)	14(7.9%)
Non-pharmacological interventions are a safe and effective alternative to pain medication.	39(21.9%)	103(57.9%)	23(12.9%)	8(4.5%)	5(2.8%)
I believe patients are receptive to trying non-pharmacologial interventions for pain management.	15(8.4%)	124(69.7%)	21(11.8%)	6(3.4%)	12(6.7%)
I believe non-pharmacological interventions can improve patient's quality of life.	31(17.4%)	113(63.5%)	19(10.7%)	6(3.4%)	9(5.1%)

Table 2 shows the perception of nurses towards the use of non-pharmacological Interventions in chronic pain management and 107(60.1%)% of the respondents agreed that non- pharmacological interventions can be effective in managing chronic pain in orthopedic patients, 102(57.3%) of the respondents agreed that I am confident in using non-pharmacological interventions for pain management, 105(59%) of the respondents agreed that there is a wide range of non-pharmacological interventions available for chronic pain management, 103(57.9%) of the respondents agreed that non-

pharmacological interventions are a safe and effective alternative to pain medication. 124(69.7%) of the respondents agreed that they believe patients are receptive to trying non-pharmacological interventions for pain management,113(63%) of the respondents agreed that they believe non-pharmacological interventions can improve patient's quality of life.

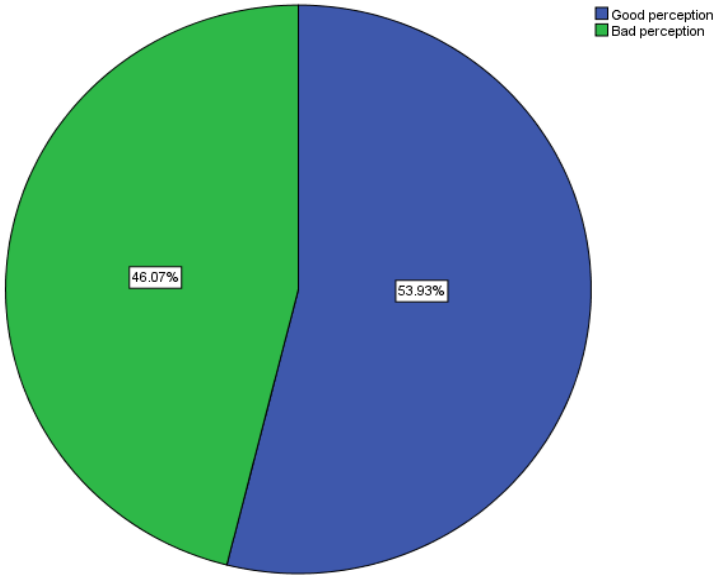

Figure 1: Shows that majority 96 (53.93%) of the respondents had good perception about the use of NPIs.

Research Question 2: What is the attitude of nurses towards the use of non-pharmacological interventions in chronic pain management?

Table 3: Attitude of Nurses towards Use of NPIs (N=178)

Variables	SA	A	N	D	SD
I make use of non-pharmacological interventions in managing chronic pain among orthopedic patients.	19(10.7%)	106(59.6%)	26(14.6%)	7(3.9%)	20(11.2%)
Non-pharmacological interventions are as effective as pharmacological interventions in managing chronic pain.	11(6.2%)	62(34.8%)	30(16.9%)	20(11.2%)	55(30.9%)
I am confident in recommending non-pharmacological to orthopedic patients experiencing chronic pain.	19(10.7%)	105(59.0%)	25(14.0%)	10(5.6%)	19(10.7%)
Non-pharmacological interventions are a valuable addition to pain management strategies for orthopedic patients.	37(20.8%)	113(63.5%)	16(9.0%)	4(2.2%)	8(4.5%)
The benefits of non-pharmacological interventions in chronic pain management outweigh the potential drawbacks.	37(20.8%)	97(54.5%)	28(15.7%)	2(1.1%)	14(7.9%)

Table 3 shows the attitude of nurses towards the use of non-pharmacological interventions in chronic pain management and 19(10.7%) of the respondents strongly agreed that they make use of non-pharmacological interventions in managing chronic pain among orthopedic patients, 55(30.9%) of the respondents disagreed that non-pharmacological interventions are as effective as pharmacological interventions in managing chronic pain. Majority of the respondents 105(59.0%) agreed that they are very confident in recommending non-pharmacological interventions to orthopedic

patients experiencing chronic pain. 97(54.5%) of the respondents agreed that the benefits of non-pharmacological interventions in chronic pain management outweigh the potential drawbacks.

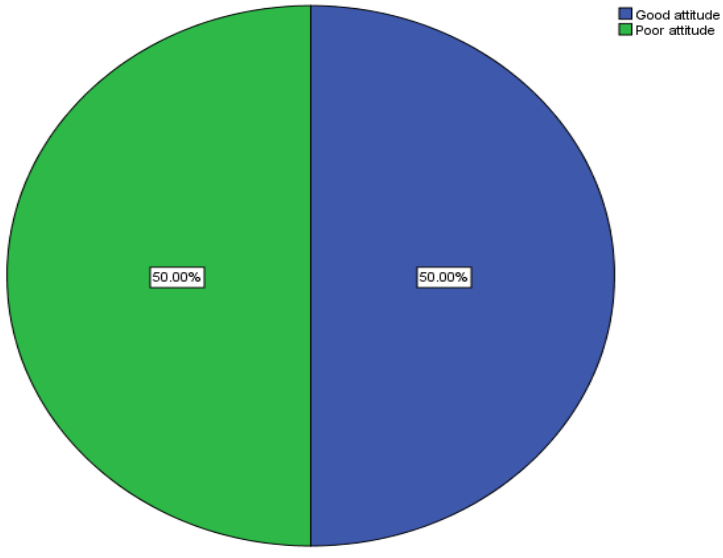

Figure 2: The attitude of nurses was split equally; (50%) had a favorable attitude.

Research Question 3: What is the prevalence of non-pharmacological interventions in management of chronic pain**?**

Table 4: Prevalence of NPIs in Chronic Pain Management

Variables	Always	Often	Sometimes	Rarely	Never
How often do you use physical therapy or other NPIs to manage chronic pain?	22(12.4%)	75(42.1%)	69(38.8%)	11(6.2%)	1(0.6%)
How often do you recommend NPIs to your	19(10.7%)	60(33.7%)	79(44.4%)	16(9.0%)	4(2.2%)

chronic pain patients?					
Are NPIs readily available to chronic pain patients in the facility?	26(14.6%)	42(23.6%)	47(26.4%)	55(30.9%)	8(4.5%)
How often do you talk about the potential benefits of NPIs with chronic pain patients?	32(18.0%)	92(51.7%)	44(24.7%)	10(5.6%)	0 (0%)

Table 4 shows the prevalence of non-pharmacological interventions in chronic pain management and 75(42.1%) of the respondents reported that they often use physical therapy or other NPIs to manage chronic pain, also 79(44.4%) of the respondents sometimes recommended NPIs to chronic pain patients. 55(30.9%) of the respondents supported that NPIs are rarely available to chronic patients in the facility and 92(51.7%) of the respondents revealed that they often talk about the potential benefits of NPIs with chronic pain patients.

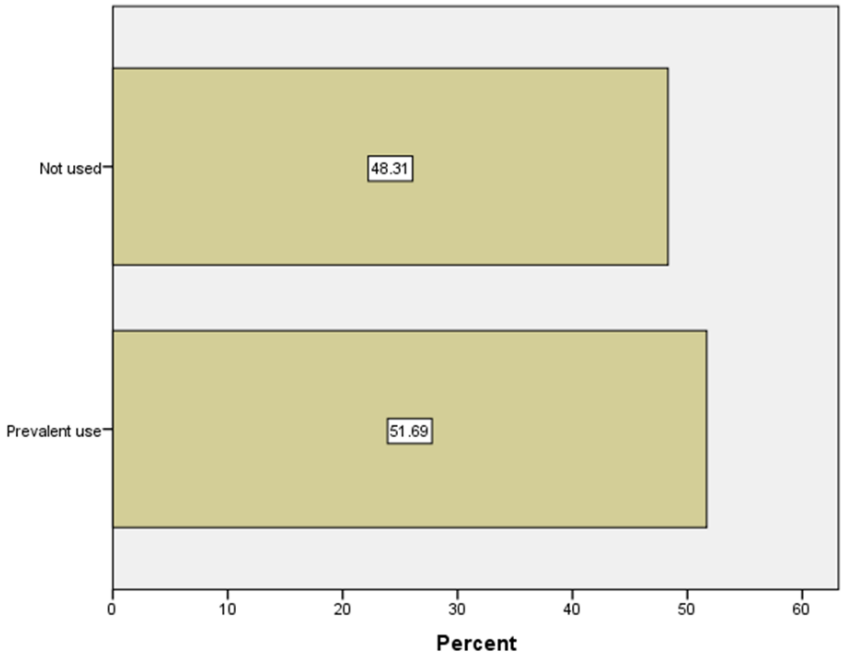

Figure 3:51.69% of nurses reported frequently using NPIs.

Research Question 4: What are the most prevalent types of non-pharmacological interventions used in chronic pain management?

Table 5: Most Prevalent Types of NPIs Used in Chronic Pain Management

Variables	Always	Often	Sometimes	Rarely	Never
Physical therapy/ Exercise programs	74(41.6%)	68(38.2%)	28(15.7%)	4(2.2%)	4(2.2%)
Assistive devices (braces, canes, splints)	52(29.2%)	65(36.5%)	47(26.4%)	4(2.2%)	10(5.6%)
Positioning	105(59.0 %)	46(25.8%)	21(11.8%)	2(1.1%)	4(2.2%)

Relaxation Techniques (e.g. Meditation, mindfulness)	60(33.7%)	69(38.8%)	44(24.7%)	5(2.8%)	0(0%)
Psychotherapy/Cognitive Behavioral Therapy (CBT)	38(21.3%)	57(32.0%)	58(32.6%)	16(9.0%)	9(5.1%)
Transcutaneous Electrical Nerve Stimulation (TENS)	25(14.0%)	26(14.6%)	51(28.7%)	34(19.1%)	42(23.6%)
Music therapy	35(19.7%)	68(38.2%)	58(32.6%)	14(7.9%)	3(1.7%)
Massage therapy	46(25.8%)	78(43.8%)	43(24.2%)	7(3.9%)	4(2.2%)
Hot or cold compress	50(28.1%)	99(55.6%)	24(13.5%)	3(1.7%)	2(1.1%)
Occupational therapy	46(25.8%)	54(30.3%)	62(34.8%)	6(3.4%)	10(5.6%)

Table 5 shows the most prevalent types of non-pharmacological interventions used in chronic pain management with their respective numbers of respondents. 74(41.6%) of the respondents always make use of physical therapy/exercise programs to manage chronic pain in orthopedic patients, 65(36.5%) of the respondents often make use of assistive devices like (braces, splints), 105(59.0%) of the respondents always make use of positioning, 69(38.8%) often make use of relaxation techniques, 58(32.6%) of the respondents revealed that psychotherapy/Cognitive Behavioral Therapy (CBT) is sometimes used as a non-pharmacological interventions used in chronic pain management. 51(28.7%) of the respondents sometimes make use of Transcutaneous Electrical Nerve Stimulation (TENS), 68(38.2%) of the respondents often make use of music therapy, 78(43.8%) of the respondents often make use of massage therapy, 99(55.6%) of the respondents often make use of hot or cold compress and 62(34.8%) of the

respondents sometimes makes use of occupational therapy as a non-pharmacological intervention in chronic pain management.

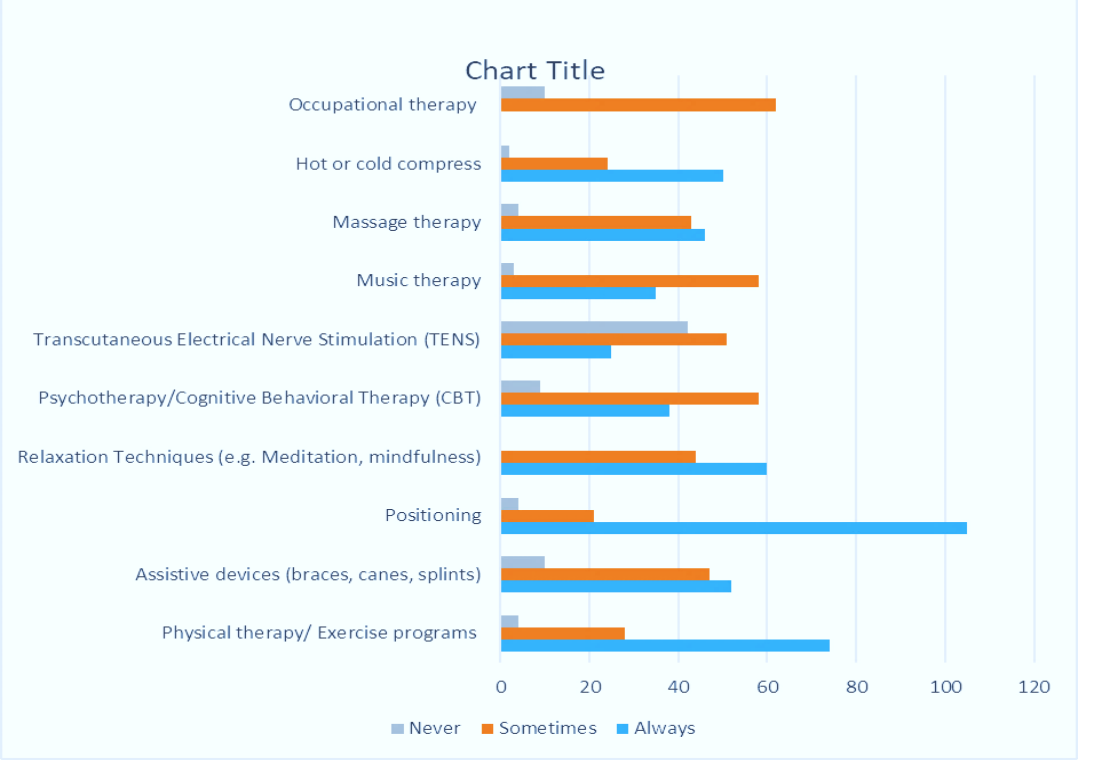

Figure 4: Shows that positioning and physical therapy/ exercise program were the most prevalent types of NPIs used in chronic pain management.

Discussion of Findings

Perception of Nurses towards the Use of Non-Pharmacological Interventions in Chronic Pain Management

Findings revealed the perception of nurses towards the use of non-pharmacological interventions in chronic pain management and 107(60.1%) of the respondents agreed that non- pharmacological interventions can be

effective in managing chronic pain in orthopedic patients. In support of the study, finding revealed that physical therapy as a non-pharmacological intervention in orthopedic pain management improves mobility and function, ultimately reducing pain intensity (Louw et al., 2021). 102(57.3%) of the respondents agreed that they are confident in using non-pharmacological interventions for pain management, 105(59%) of the respondents agreed that there is a wide range of non-pharmacological interventions available for chronic pain management. In support of this study, finding revealed that there are wide range of non-pharmacological interventions that provide substantial relief from chronic pain while minimizing the adverse effects associated with long-term medication use, examples are; physical therapy, cognitive therapy, acupuncture and massage therapy. 103(57.9%) of the respondents agreed that non-pharmacological interventions are a safe and effective alternative to pain medication. In support, findings revealed that non-pharmacological interventions offer a safe and effective alternative to pain medications, providing sustained pain relief, reducing the risk of side effects, and improving overall patient outcomes (Geneen et al., 2021).124(69.7%) of the respondents agreed that they believe patients are receptive to trying non-pharmacological interventions for pain management, in contrast of the study, finding revealed that patients from lower socioeconomic backgrounds were less likely to try alternative pain management methods due to limited access and knowledge, while those from higher socioeconomic backgrounds were more likely to seek out and accept these interventions (Brown et al., 2021).113(63%) of the respondents agreed that they believe non-pharmacological interventions can improve patient's quality of life.

Attitude of Nurses towards the Use of Non-Pharmacological Interventions in Chronic Pain Management

Findings revealed the attitude of nurses towards the use of non-pharmacological interventions in chronic pain management, and 106(59.6%%) of the respondents agreed that they make use of non-pharmacological in managing chronic pain in orthopedic patients, in support

of the study, finding revealed that non-pharmacological interventions, such as repositioning, using comfort equipment, and ensuring patients' room was quiet and comfortable were used by nurses and are effective in managing chronic pain (Kia et al.,2021), 105(59%) of the respondents agreed that they are confident in recommending non-pharmacological interventions for pain management, 113(63.5%) of the respondents agreed that non-pharmacological interventions are a valuable addition to pain management strategies for orthopedic patients, in support. 97(54.5%) of the respondents agreed that the benefits of non-pharmacological interventions in chronic pain management outweigh the potential drawbacks, in support of this, a study carried out by (El Geziry et al., 2018) revealed that NPIs reduce the risk of side effects, help patient be in charge of their own care and are also relatively inexpensive. Finding revealed that non-pharmacological interventions are not only effective in reducing pain but also contribute to improving patients' overall quality of life (Ehde et al., 2021).

Prevalence of Non-pharmacological Interventions in Chronic Pain Management

Findings revealed the prevalence of non-pharmacological interventions in chronic pain management, and 75(42.1%) of the respondents reported that they often use physical therapy or other NPIs to manage chronic pain, A study by (Louw et al.,2021), revealed that physical and exercise therapy is primarily carried out by physiotherapists, but nurses assists by helping patients manage their care plans, encouraging adherence to prescribed physical therapy exercises, and monitoring them for any side effects or complications. Similarly, a finding by (Chiarotto et al.,2021), points out that nurses often participate in multidisciplinary teams, collaborating with physiotherapists to ensure comprehensive pain management but do not administer physical therapy themselves. 79(44.4%) of the respondents sometimes recommended NPIs to chronic pain patients. 55(30.9%) of the respondents supported that NPIs are rarely available to chronic patients in the facility, in collaboration to the study conducted, finding revealed that chronic pain patients often face limited access to therapies such as physical therapy,

cognitive-behavioral therapy (CBT), and acupuncture due to insufficient staffing of specialized practitioners or the lack of institutional integration of these therapies into standard care protocols.[2] Similarly, a review by (McPherson et al., 2020), shows that while NPIs like physical therapy and mindfulness-based therapies are acknowledged as beneficial, their implementation in clinical practice is often hindered by the healthcare system's emphasis on pharmacological treatments, particularly in busy hospital settings. Finding revealed that 92(51.7%) of the respondents reported that they often discuss about the potential benefits of NPIs with chronic pain patients. In support of the study, finding revealed that nurses do discuss NPIs with chronic pain patients and these conversations tend to improve patient engagement in their treatment plans *(* Boissonnault *et* al.,2021).

Most Prevalent Types of Non-Pharmacological Interventions Used in Chronic Pain Management

Findings revealed the most prevalent types of non-pharmacological interventions used in chronic pain management with their respective numbers of respondents. 74(41.6%) of the respondents always make use of physical therapy/ exercise programs as a non-pharmacological interventions used in chronic pain management, 65(36.5%) of the respondents often makes use of assistive devices like (braces, splints). A study reviewed by (Chiarotto et al., 2021), indicates that assistive devices help to alleviate pain by promoting proper body mechanics and posture, which are critical in conditions like osteoarthritis and chronic back pain. Additionally, proper positioning techniques, particularly for bedridden or wheelchair-bound patients, help in preventing pressure ulcers and reducing musculoskeletal discomfort (Boissonnault et al., 2021). 105(59.0%) of the respondents always makes use of positioning. 69(38.8%) often makes use of relaxation techniques. A study by (McPherson et al., 2020), found that relaxation techniques are beneficial for patients suffering from conditions like fibromyalgia and chronic headaches. By helping patients to focus on mental relaxation, these interventions have been shown to decrease the perception of pain and improve overall quality of life. 58(32.6%) of the respondents revealed that psychotherapy/Cognitive Behavioral Therapy (CBT) is sometimes used as a non-pharmacological intervention used in chronic pain management. Finding revealed

that Cognitive Behavioral Therapy (CBT) helps chronic pain patients alter their pain-related thoughts and behaviors, leading to a reduction in pain intensity and distress (Ehde et al.,2021). 51(28.7%) of the respondents sometimes makes use of Transcutaneous Electrical Nerve Stimulation (TENS), 68(38.2%) of the respondents often makes use of music therapy. Study conducted by (Chiarotto et al., 2021) revealed that music therapy helps to distract patients from their pain, reduce anxiety, and promote relaxation. 99(55.6%) of the respondents often makes use of hot or cold compress and 62(34.8%) of the respondents sometimes makes use of occupational therapy as a non-pharmacological intervention used in chronic pain management.

Conclusion

The study concludes that while nurses are generally open to using NPIs in managing chronic pain among orthopedic patients, significant barriers such as limited training, lack of institutional support, and inadequate resources impede their widespread adoption. The findings suggest that improving nurses' knowledge and access to NPIs can enhance the quality of care and patient outcomes in chronic pain management. Moreover, the study emphasizes the importance of a multidisciplinary approach where nurses collaborate with other healthcare professionals in implementing NPIs

Suggestion

1. There should be incorporation of a well detailed modules on NPIs for chronic pain management in nursing education and training programs. This will provide nurses with the skills and knowledge to apply NPIs effectively.
2. Development of standardized clinical protocols for integrating NPIs with pharmacological treatments, ensuring NPIs should be included as part of routine care for chronic pain management.
3. Collaboration between nurses, physiotherapists, psychologists, and other healthcare providers to ensure comprehensive pain management strategies that include NPIs should encouraged.
4. Establishment of continuing education programs focused on NPIs that will ensure nurses remain up-to-date with the latest research and practices in non-pharmacological pain management should also be encouraged.

References

Adollahyar, A., Baniasadi, H., Doustmohammadi, M. M., Sheikhbardesiri, H., & Yarmohammadian, M. H. (2019). Attitudes of Iranian nurses toward spirituality and spiritual care. Journal of Christian Nursing, 36(1), E11–E16.

Boissonnault, W. G., Betts, K. J., & Cook, C. E. (2021). Availability and integration of physical therapy for patients with chronic pain in healthcare settings: A systematic review. Journal of Pain Research, 14, 257–265.

Brown, C., Khan, M., & Waters, L. (2021). Barriers and facilitators to the use of non-pharmacological interventions in chronic pain management: A socioeconomic perspective. Journal of Pain Research, 14, 1123–1135.

Chiarotto, A., Koes, B. W., Nijs, J., & Ostelo, R. W. (2021). Complementary and integrative medicine in chronic pain management: What is the evidence? Pain Reports, 6(1), e883.

Ehde, D. M., Dillworth, T. M., & Turner, A. P. (2021). Cognitive-behavioral therapy for individuals with chronic pain: Efficacy, innovations, and directions for research. American Psychologist, 76(5), 827–842.

El Geziry, A., Toble, Y., Al Kadhi, F., Pervaiz, M., & Al Nobani, M. (2018). Non-pharmacological pain management. In Pain Management in Special Circumstances (pp. 1–14).

El-Tallawy, S. N., Nalamasu, R., Salem, G. I., LeQuang, J. A. K., Pergolizzi, J. V., & Christo, P. J. (2021). Management of musculoskeletal pain: An update with emphasis on chronic musculoskeletal pain. Pain and Therapy, 10, 181–209.

Geneen, L. J., Clarke, C., Moore, R. A., Smith, B. H., Colvin, L. A., & Martin, D. (2021). Physical activity and exercise for chronic pain in adults: An overview of Cochrane reviews. Cochrane Database of Systematic Reviews, 2021(2), CD011279.

Gupta, R. (2023). Non-pharmaceutical management of chronic pain. GSC Advanced Research and Reviews, 16(2), 158–165.

Kia, Z., Allahbakhshian, M., Ilkhani, M., Nasiri, M., & Allahbakhshian, A. (2021). Nurses' use of non-pharmacological pain management methods in intensive care units: A descriptive cross-sectional study. Complementary Therapies in Medicine, 58, 102705.

Louw, A., Diener, I., Fernández-de-Las-Peñas, C., & Puentedura, E. J. (2021). The efficacy of pain neuroscience education on musculoskeletal pain: A systematic review of the literature. Journal of Manual & Manipulative Therapy, 29(2), 70–82.

Mallick-Searle, T., Sharma, K., Toal, P., & Gutman, A. (2021). Pain and function in chronic musculoskeletal pain—Treating the whole person. Journal of Multidisciplinary Healthcare, 14, 335–347.

McPherson, M. L., Walker, K. A., & Davis, M. P. (2020). Non-pharmacological management of chronic pain in healthcare settings: Barriers and opportunities. Pain Medicine, 21(5), 879–887.

Morelli, J. (2021, July 9). Types of pain relief medications: Uses, side effects & comparison. RxList. Retrieved May 3, 2025, from https://www.rxlist.com/pain_medications/drugs-c-condition.htm

Nicholas, M., Vlaeyen, J. W. S., & Rief, W. (2019). The IASP classification of chronic pain for ICD-11. Pain, 160, 28–37.

Nomikos, P. A., Hall, M. C., Fuller, A., Ogollah, R., Valdes, A. M., & Doherty, M. (2022). Acceptability of a nurse-led non-pharmacological complex intervention for knee pain: Nurse and patient views and experiences. PLoS ONE, 17(1), e0262422.

Vos, T., Abajobir, A. A., Abate, K. H., Abbafati, C., Abbas, K. M., Abd-Allah, F., et al. (2017). Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: A systematic analysis for the Global Burden of Disease Study 2016. The Lancet, 390(10100), 1211–1259.

Williams, A., Kamper, S. J., Wiggers, J. H., O'Brien, K. M., Lee, H., Wolfenden, L., et al. (n.d.). Musculoskeletal conditions may increase the risk of chronic disease: A systematic review and meta-analysis of cohort studies. [Journal name missing].

World Health Organization. (2019). Musculoskeletal conditions. Geneva: World Health Organization. Retrieved July 17, 2020, from https://www.who.int/news-room/fact-sheets/detail/musculoskeletal-conditions