Knowledge and adherence to osteoarthritis clinical practice guidelines among physiotherapists in Saudi Arabia: a cross-sectional study

Conocimiento y adherencia a las guías de práctica clínica de la osteoartritis entre fisioterapeutas en Arabia Saudita: un estudio transversal

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Abstract:
Background: Clinical practice guidelines (CPGs) are essential for the effective management of osteoarthritis (OA), yet their implementation among physiotherapists remains inconsistent. This study aimed to assess the knowledge and adherence of physiotherapists in Saudi Arabia to OA CPGs. **Methods:** A cross-sectional study was conducted using a self-administered online questionnaire targeting licensed physiotherapists in Saudi Arabia. The survey included demographic data, knowledge assessment through CPG-based statements, and a clinical vignette to evaluate adherence. Participants were categorized as Delivering, Partially Delivering, or Non-Delivering based on their alignment with CPG-recommended interventions. **Results:** Of 384 participants, 69% demonstrated high adherence (Delivering), while 26.3% were Non-Delivering and 4.7% Partially Delivering. Higher adherence was associated with postgraduate education, longer clinical experience, greater exposure to OA cases, and working in university or private centers. Despite 93.5% having read at least one CPG, adherence varied significantly across groups. **Conclusion:** While awareness of OA CPGs is high among physiotherapists, gaps in practical application persist. Targeted education, workplace support, and policy initiatives are needed to enhance adherence and improve OA care. Further research should explore barriers to guideline implementation and test tailored interventions**.**

Keywords: Osteoarthritis, Clinical Practice Guidelines, Physiotherapy, Adherence, Saudi Arabia, Evidence-Based Practice

Resumen:
Antecedentes: Las guías de práctica clínica (GPC) son esenciales para el tratamiento eficaz de la osteoartritis (OA); sin embargo, su aplicación entre los fisioterapeutas sigue siendo inconsistente. Este estudio tuvo como objetivo evaluar el conocimiento y la adherencia de los fisioterapeutas en Arabia Saudita a las GPC sobre OA. **Métodos:** Se realizó un estudio transversal mediante un cuestionario en línea autoadministrado dirigido a fisioterapeutas colegiados en Arabia Saudita. La encuesta incluyó datos demográficos, una evaluación de conocimientos mediante declaraciones basadas en las GPC y una viñeta clínica para evaluar la adherencia. Los participantes se clasificaron como en cumplimiento, cumplimiento parcial o no cumplimiento según su alineamiento con las intervenciones recomendadas por las GPC. **Resultados:** De 384 participantes, el 69 % mostró una alta adherencia (cumplimiento), mientras que el 26,3 % no cumplió y el 4,7 % cumplió parcialmente. Una mayor adherencia se asoció con estudios de posgrado, mayor experiencia clínica, mayor exposición a casos de OA y el trabajo en centros universitarios o privados. A pesar de que el 93,5 % había leído al menos una guía práctica clínica (GPC), la adherencia varió significativamente entre los grupos. **Conclusión**: Si bien los fisioterapeutas tienen un alto nivel de conocimiento sobre las GPC para la artrosis, persisten lagunas en su aplicación práctica. Se necesita formación específica, apoyo en el entorno laboral e iniciativas políticas para mejorar la adherencia y la atención de la artrosis. Se recomienda

que futuras investigaciones exploren las barreras para la implementación de las guías y prueben intervenciones personalizadas.

Palabras clave: Artrosis, Guías de práctica clínica, Fisioterapia, Adherencia, Arabia Saudí, Práctica basada en la evidencia

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1. Introduction

Osteoarthritis (OA) is a degenerative joint disease characterized by the breakdown of cartilage, which leads to bones rubbing against each other (1). The pathological progression of OA involves the gradual loss and deterioration of articular cartilage, osteophyte (bone spur) formation, thickening of subchondral bone, varying degrees of synovial inflammation, degeneration of the knee menisci and ligaments, and hypertrophy of the joint capsule (2-3). The primary symptom is joint pain, which is also the most common complaint among individuals with OA (4). The pain and other clinical manifestations of OA can significantly impair both the physical and psychological quality of life of those affected. Knee OA, in particular, arises from multiple pathological processes involving the cartilage, meniscus, ligaments, and surrounding muscles. It is a common cause of pain and disability, yet many patients can be effectively managed in primary healthcare settings (5- 6). In 2019, OA affected approximately 528 million people globally. Around 73% of those affected are aged over 55, and 60% are women (7). Among all joints, the knee is the most commonly impacted by OA, with a reported prevalence of 16.3% across Gulf countries (8). In Saudi Arabia, the prevalence increases with age—31% in individuals aged 46–55 years and rising to 61% among those aged 66–75 years (9). Age and female gender are key risk factors, with the highest burden observed in individuals aged 60–64 years (10).

Several international clinical practice guidelines (CPGs), including those from the European League Against Rheumatism (EULAR), the Osteoarthritis Research Society International (OARSI), and the National Institute for Health and Care Excellence (NICE), recommend education and exercise as the primary interventions for OA due to their consistent effectiveness in reducing pain and disability, irrespective of disease severity (11-15). These CPGs categorize the strength of evidence for treatments using a classification ranging from IA (based on systematic reviews of randomized controlled trials) to IV (based on expert opinion or lower-quality studies) (11-12, 16). The strength of these recommendations depends not only on the quality of evidence but also on the balance between benefits and risks, patient values and preferences, and resource considerations (17). Consequently, interventions such as patient education and therapeutic exercise (IA level of evidence) are regarded as first-line treatments, while others like hyaluronic acid injections and manual therapy (IV level of evidence) are considered conditional recommendations (11-12). Despite the availability of high-quality CPGs, implementation remains suboptimal. Egerton et al. found that many physicians managing OA feel underprepared and unfamiliar with current guidelines (18). Likewise, adherence among physiotherapists remains low, with underuse of core treatments such as education, exercise, and weight management, and a preference for passive modalities like manual therapy(19-21).

Studies examining physiotherapists' knowledge and implementation of OA CPGs have highlighted substantial gaps, particularly in delivering active treatments (22). This gap is partly attributed to the complexity of OA management, which requires aligning best practices with patient beliefs and preferences (23). Additional barriers such as time constraints, language challenges, and difficulties applying guidelines in practice further contribute to this evidence-to-practice gap (24). The mere development and dissemination of CPGs do not ensure their uptake. While guideline developers may facilitate distribution, implementation typically falls outside their responsibility (25). The limited use of evidence-based guidelines has contributed to a persistent "know-do" gap—the discrepancy between established knowledge and its clinical application. This issue is especially prominent in conditions where treatment approaches vary and no single therapy is universally effective (26).

To date, limited attention has been given to examining the evidence-to-practice gap in Saudi Arabia. Therefore, this study aims to evaluate the level of knowledge and adherence to osteoarthritis clinical practice guidelines among physiotherapists in Saudi Arabia.

2. Methods

Study Design

This cross-sectional study was conducted using a self-administered online survey targeting physiotherapists practicing in Saudi Arabia. Ethical approval was granted by the Scientific Research Ethics Committee of Taif University, Saudi Arabia (Application No. 45-141). The study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for reporting observational research (27).

Participants

Participants were recruited through non-random and based on convenience sampling, primarily via direct contact and outreach via social media platforms such as Twitter, WhatsApp, and Telegram using a Google Form. To participate, individuals had to provide informed consent. Eligibility criteria included being a licensed physiotherapist with a Bachelor of Science in Physiotherapy, currently practicing in Saudi Arabia and having treated at least one patient with knee osteoarthritis within the past two years. Those who did not consent to participate, were not licensed in Saudi Arabia, were not physiotherapists, had previously completed the survey, or declined to complete the questionnaire were excluded. Individuals who answered "no" to the consent question were redirected to the end of the form and prevented from proceeding.

Sample Size Estimation

The sample size was calculated using the Calculator.net tool, based on the total population of 12,544 licensed physiotherapists in Saudi Arabia (according to SCFHS statistics). A minimum of 370 participants was required to achieve a 5% margin of error with a 95% confidence level.

Survey Development

The questionnaire was adapted from a previously published Italian study (28). The questionnaire was developed based on the EULAR, OARSI, and NICE CPGs (29-31) and delivered in English, as all physiotherapists all physical therapists deliver their education in English. The questionnaire was divided into three sections:

• Section 1: Demographics

This section collected data on age, sex, years of professional experience, and whether the participant had read at least one osteoarthritis clinical practice guideline (CPG).

• Section 2: Knowledge of OA CPGs

Participants rated their agreement with various CPG-based statements using a 5-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree) (32). Scores of 4–5 indicated agreement with the statement. To reduce acquiescence bias—the tendency to agree with statements—eleven reversed items were included. Disagreement with these reversed items (scores 1–2) was also interpreted as agreement with the corresponding CPG recommendations (33).

• Section 3: Adherence to OA CPGs

This section included a clinical vignette presenting a hypothetical case of knee osteoarthritis (see Table 2). Clinical vignettes are recognized tools for assessing clinical reasoning and behavior, including among physiotherapists, as they are easy to distribute and allow control over variables (34). Participants were asked how they would manage the case by selecting from a predefined list of options. These options were organized into three phases: assessment, management, and treatment. In the management phase, participants indicated whether they would treat the patient themselves or refer them to a specialist for pharmacological or surgical intervention.

The internal consistency of the knowledge section, which included both standard and inverted items to minimize acquiescence bias, was evaluated using Cronbach's alpha and found to be 0.82—indicating good reliability.

Conditional treatments, such as joint injections or manual therapy, were classified according to their use about core recommendations. Participants who selected only conditional or non-recommended treatments—without including both education and therapeutic exercise—were

categorized as "Non-delivering." If conditional treatments were selected alongside core treatments but without any non-recommended modalities, participants were placed in the "Partially delivering" group. This approach reflects the prioritization of high-evidence interventions (IA level), while recognizing that some conditional treatments may be appropriate adjuncts in specific clinical scenarios(11-12).

Statistical analysis

It was conducted using SPSS version 25, with demographic data summarized in Excel. Continuous variables were reported as means ± standard deviations, and categorical variables as percentages. For knowledge of CPGs (Section 2), agreement was defined as selecting scores of 4–5 for standard statements or 1–2 for reversed items, with consensus set at ≥ 70% agreement. For adherence (Section 3), participants were categorized as Delivering (all recommended, no non-recommended treatments), Partially Delivering (some recommended, no non-recommended), or Non-Delivering (any non-recommended treatment, no treatment, or fewer than five sessions).

Table 1. Section 2.

Statements and Synoptic Review of Clinical Practice Guidelines
1) Exercise can be effective on all patients, regardless of the pain severity.
2) In an advanced stage of the disease, exercise can damage the joint (reversed statement).
3) The rehabilitation program must always include a part of education on the pathophysiology of osteoarthritis and self-management strategies.
4) The rehabilitation program should always include a part of manual treatment (reversed statement).
5) Exercise should only be undertaken after prescribing drug treatment to control pain (reversed statement).
6) The use of topical anti-inflammatory drugs is effective for pain relief for knee osteoarthritis.
7) Radiographic findings are needed to express a functional diagnosis of osteoarthritis (reversed statement).
8) Radiographic findings are needed to plan the physiotherapy treatment (reversed statement).
9) Physical activity should be avoided because it can damage the joint (reversed statement).
10) The use of topical anti-inflammatory drugs is effective for pain relief for hip osteoarthritis.
11) In case of severe joint degeneration, it is necessary to recommend rest from physical activity (reversed statement).
12) In cases of severe pain (VAS ≥ 6/10), arthroplasty surgery should be preferred to rehabilitation (reversed statement).
13) The use of TENS should be considered.
14) The use of physical therapies such as lasers, TECAR and ultrasound therapy should be considered (reversed statement).
15) In addition to the rehabilitation treatment, it is useful to recommend physical activity (for example, yoga, swimming, Nordic walking).
16) It is important to recommend weight loss to overweight or obese patients.
17) Age > 45, pain and absence of joint stiffness (or < 30 min) in the morning are sufficient to diagnose osteoarthritis.
18) The use of comfortable footwear, braces or aids should be considered.
19) It is advisable to refer the patient for arthroscopy surgery to reduce symptoms and start/continue treatment (reversed statement).
20) It is necessary to assess the impact of osteoarthritis on function, quality of life and disability.
21) At least 10–12 sessions are needed to ensure proper treatment for osteoarthritis.
22) In the treatment for osteoarthritis, the patient's adherence to the treatment must be motivated.
23) Joint hyaluronic acid and/or corticosteroid infiltrations should be considered.
24) The supplements of chondroitin and glucosamine should be considered (reversed statement).

Table 2. Section 3: clinical vignette.

Vignette
Maria, a 72-year-old housewife, lives with her husband, who is in good health. She cultivates the hobby of gardening. For the past ten years, she has been suffering from knee pain which, in certain periods, forces her to take NSAIDs and to limit daily activities for a few days. Over the past two years, the pain has become increasingly frequent (VAS 5/10), so that she has decided to find some help with the housework, and she is struggling to take care of the garden. She also suffers from diabetes and is overweight (BMI 28). She decides to consult her physician, who recommends her to do a visit to the physiotherapist.

3. Results

Participant Characteristics

A total of 384 physiotherapists participated in the study. Of these, 226 (58.9%) were male and 158 (41.1%) were female. The median age was 35 years (IQR = 8). The majority held a bachelor's degree (n = 162, 42.2%), while 88 (22.9%) had completed some postgraduate education, and 50 (13%) held a master's degree. Only 3 participants (0.8%) reported holding a PhD, while 81 (21.1%) had a diploma (table 3).

Participants were distributed across different regions, with the highest representation from the western region (n = 135, 35.2%), followed by the central (n = 79, 20.6%), eastern (n = 61, 15.9%), northern (n = 60, 15.6%), and southern regions (n = 49, 12.8%). Regarding the workplace, 160 (41.7%) were employed in Ministry of Health (MOH) hospitals, followed by private centers (n = 79, 20.6%), military hospitals (n = 76, 19.8%), university hospitals (n = 64, 16.7%), and MOH primary health centers (n = 5, 1.3%). In terms of clinical experience, 161 participants (41.9%) had 1–5 years of experience, 113 (29.4%) had 6–9 years, and 108 (28.1%) had ≥ 10 years, with only 2 (0.5%) reporting no clinical experience. Most participants had recently interacted with 6–10 osteoarthritis (OA) cases (n = 128, 33.3%), while 84 (21.9%) interacted with 1–5 cases, and 88 (22.9%) interacted with 11–15 cases. Notably, 93.5% (n = 359) had read at least one OA clinical practice guideline (CPG).

Table 3. Demographics of the participants

Variables	Sample size = 384	
Gender, n (%)	Male	226 (58.9)
	Female	158 (41.1)
Age, years, median (IQR)		35 (8)
Level of education, n (%)	Diploma	81 (21.1)
	Bachelor's degree	162 (42.2)
	Completed some postgraduate	88 (22.9)
	Master's degree	50 (13)
	PhD	3 (8)
Living regions, n (%)	Central	79 (20.6)
	Western	135 (35.2)
	Eastern	61 (15.9)
	Southern	49 (12.8)
	Northern	60 (15.6)
Workplace, n (%)	MOH hospitals	160 (41.7)
	MOH primary health centers	5 (1.3)
	University hospitals	64 (16.7)
	Private centers	79 (20.6)
	Military hospitals	76 (19.8)
Clinical Experience, n (%)	0	2 (0.5)

	1-5	161 (41.9)
	6-9	113 (29.4)
	≥ 10 years	108 (28.1)
Cases of OA recently interacted with, n (%)	1-5	84 (21.9)
	6-10	128 (33.3)
	11-15	88 (22.9)
	16-20	52 (13.5)
	>20	32 (8.3)
Read at least one OA CPGs, n (%)	Yes	359 (93.5)
	No	25 (6.5)

Participants were categorized into three groups based on their adherence to the clinical vignette: "Delivering" (n = 265, 69.0%), "Non-delivering" (n = 101, 26.3%), and "Partially delivering" (n = 18, 4.7%), (table 4). Among the "Delivering" group, males comprised 51% (n = 136) and females 49% (n = 129). In contrast, the "Non-delivering" group had a higher proportion of males (77%) compared to females (23%). Interestingly, in the "Partially delivering" group, 67% were male and 33% female. The median age varied slightly across the three groups: 34 years (IQR = 8) for the "Delivering" group, 36 years (IQR = 6) for the "Non-delivering" group, and 31.5 years (IQR = 8) for the "Partially delivering" group.

Bachelor's degree holders represented the majority in all groups. In the "Delivering" group, 38% held a bachelor's degree and 22% had some postgraduate education. Among the "Non-delivering" group, 49% held bachelor's degrees and 28% had some postgraduate education. The "Partially delivering" group showed a higher proportion of bachelor's degree holders (61%) and some PhD representation (11%).

A notable proportion of "Delivering" participants worked in MOH hospitals (35%), followed by university hospitals (26%) and military hospitals (20%). In contrast, the "Partially delivering" group had the highest proportion working in MOH hospitals (67%). In the "Non-delivering" group, MOH hospitals also constituted the largest share (54%), followed by military hospitals (23%).

Table 4. Participants' profile by the level of adherence for the clinical vignette.

Variables	Sample size = 384		
	"Delivering" (N=265)	"Partially delivering" (N=18)	"Non-Delivering" (N=101)
Gender, n (%)			
Male	136 (51)	129 (49)	78 (77)
Female	12 (67)	6 (33)	23 (23)
Age, years, median (IQR)	34 (8)	31.5 (8)	36 (6)
Level of education, n (%)			
Diploma	65 (25)	0 (0)	16 (16)
Bachelor's degree	102 (38)	11 (61)	49 (49)
Completed some postgraduate	58 (22)	2 (11)	28 (28)
Master's degree	40 (15)	3 (17)	7 (6.9)
PhD	0 (0)	2 (11)	1 (1)
Living regions, n (%)			
Central	50 (19)	1 (5.6)	28 (28)
Western	93 (35)	7 (39)	35 (35)
Eastern	52 (20)	5 (28)	4 (4)
Southern	39 (15)	5 (28)	5 (5)

Northern	31 (12)	0 (0)	29 (29)
Workplace, n (%)			
MOH hospitals	93 (35)	12 (67)	55 (54)
MOH primary health centers	3 (1.1)	2 (11)	0 (0)
University hospitals	70 (26)	1 (5.6)	8 (7.9)
Private centers	47 (18)	2 (11)	15 (15)
Military hospitals	52 (20)	1 (5.6)	23 (23)
Clinical Experience, n (%)			
0	2 (0.8)	0 (0)	0 (0)
1-5	108 (41)	5 (28)	48 (48)
6-9	66 (25)	6 (33)	41 (41)
≥ 10 years	89 (34)	7 (39)	12 (12)
Cases of OA recently interacted with, n (%)			
1-5	44 (17)	5 (28)	35 (35)
6-10	83 (31)	9 (50)	36 (36)
11-15	58 (22)	3 (17)	27 (27)
16-20	49 (18)	0 (0)	3 (3)
>20	31 (12)	1 (5.6)	0 (0)
Read at least one OA CPGs, n (%)			
Yes	249 (94)	10 (56)	100 (99)
No	16 (6)	8 (44)	1 (1)

Participants with ≥ 10 years of experience were most prevalent in the "Delivering" group (34%) and the "Partially delivering" group (39%). In the "Non-delivering" group, the majority had between 1–9 years of experience (89%), with only 12% having ≥ 10 years.

The western region was the most represented in all adherence levels. In the "Delivering" group, 35% were from the western region, followed by the eastern region (20%). The "Non-delivering" group also showed the highest representation from the western region (35%), but had significant representation from the northern region as well (29%). The "Partially delivering" group was more evenly distributed across western, eastern, and southern regions, each representing around 28–39%.

Higher adherence was associated with greater exposure to OA cases. Among the "Delivering" group, 31% had seen 6–10 OA cases and 22% had seen 11–15. In contrast, 36% of the "Non-delivering" group had seen 6–10 cases, and 35% had seen only 1–5. The "Partially delivering" group had the highest proportion seeing 6–10 cases (50%).

Of those in the "Delivering" group, 94% had read at least one OA CPG. This contrasts with 56% in the "Partially delivering" group and 99% in the "Non-delivering" group. Interestingly, despite high familiarity, some participants still demonstrated low adherence.

4. Discussion

This study examined the adherence of physiotherapists in Saudi Arabia to clinical practice guidelines (CPGs) for osteoarthritis (OA) using a clinical vignette. While a majority (69%) demonstrated high adherence, a substantial portion (31%) exhibited either partial or non-adherence, underscoring a continued evidence-to-practice gap despite widespread awareness of OA guidelines.

The high level of adherence observed aligns with global trends reporting increased guideline awareness among physiotherapists and other clinicians managing musculoskeletal conditions (35-36). However, similar to findings from other contexts, a significant proportion of physiotherapists in this study did not fully align with recommended practices, pointing to persistent barriers in guideline implementation (37-38).

Although 93.5% of participants reported having read at least one OA clinical practice guideline, this self-report measure does not assess the depth of understanding or the ability to apply the guidelines in practice. Simply reporting guideline exposure may overestimate actual competence. While our study attempted to address this gap through both knowledge-based statements and a clinical vignette, more robust tools—such as objective tests or observed structured clinical examinations (OSCEs)—may better capture true guideline literacy and application in future studies (39). Others may lack the confidence or training to implement interventions such as exercise or education, especially in complex cases (18, 23). Practical barriers—including limited time, resources, or institutional support—also hinder application, particularly in MOH or military settings (20, 45). Additionally, patient preferences for passive treatments or skepticism about guideline relevance can influence practice (23, 24). These findings highlight the need for targeted training and organizational strategies to support effective implementation

Participants with postgraduate education—especially those holding a master's degree—were more frequently represented in the "Delivering" group. This is consistent with prior research suggesting that higher educational attainment is associated with stronger evidence-based practice skills and greater confidence in applying guidelines (39). In contrast, those with a diploma or bachelor's degree were more prevalent among the lower adherence groups, possibly reflecting differences in curricular exposure to guideline-based care (40).

Longer clinical experience (≥ 10 years) was also associated with higher adherence, a pattern supported by literature indicating that extended professional practice may foster familiarity with condition-specific guidelines and confidence in clinical reasoning (41). However, other studies suggest that recent graduates may be more attuned to evidence-based practice due to their recent training (42). In this study, mid-career physiotherapists (6–9 years) were found across all adherence categories, indicating that clinical experience alone may not consistently predict guideline use.

Exposure to OA cases appeared to be associated with higher adherence. Those who reported managing a greater number of OA patients were more likely to follow guideline-recommended interventions (43). This aligns with findings that increased clinical exposure enhances familiarity and application of evidence-based care .

Workplace context played a role as well. Participants working in university and private hospitals showed greater adherence than those in MOH primary health centers or military hospitals. This may reflect differences in access to continuing education, supervision, and institutional support for evidence-based practice (44-45).

Geographic variation was also observed. The western region of Saudi Arabia had higher representation among adherent physiotherapists, which may suggest regional differences in professional development infrastructure or institutional emphasis on best practices. Targeted strategies addressing regional disparities may be necessary to promote consistent adoption of CPGs (46).

The implementation of CPGs in Saudi Arabia may be affected by several contextual factors unique to its cultural and healthcare landscape. Language plays a key role, as most CPGs are published in English, which may limit accessibility for some practitioners, particularly in settings where Arabic is predominantly used in communication. Cultural norms, such as gender segregation and hierarchical workplace structures, may also influence interprofessional collaboration and decision-making processes (48-49). Furthermore, variability in institutional support, especially between public and private sectors, affects opportunities for continuing education and access to evidence-based resources. These factors may contribute to inconsistencies in guideline adherence and highlight the importance of culturally tailored implementation strategies that consider local values, language preferences, and system-level constraints.

Interestingly, gender dynamics may also play a role. A higher proportion of males were classified as "Non-delivering," which may be partially explained by sociocultural and institutional factors within the Saudi healthcare system (47). Previous literature indicates that gender roles, segregation, and unequal access to mentorship and leadership opportunities may shape clinical

decision-making and professional development. Further investigation into how gender influences guideline adherence is warranted(48).

The findings of this study support the need for multifaceted strategies to enhance adherence to OA CPGs. These may include integrating guideline-based content into physiotherapy education, expanding access to continuing professional development, and strengthening institutional support for evidence-based practice (49, 50).. Additionally, the clinical vignette methodology used here proved effective for capturing clinical decision-making and may be a useful tool in both research and education (51).

While this study recommends targeted training, workplace support, and policy initiatives to improve adherence, we acknowledge that there is limited evidence specifically evaluating which interventions are most effective in the Saudi Arabian physiotherapy context. However, studies on healthcare professionals in Saudi Arabia have identified key barriers such as lack of institutional support, inadequate continuing education opportunities, and variability in evidence-based practice training(48, 49). These findings suggest that interventions should be tailored to local organizational structures and cultural considerations, with future research needed to evaluate the effectiveness of such strategies in physiotherapy practice.

The use of clinical vignettes in this study allowed standardized assessment of physiotherapists' decision-making aligned with OA guidelines. Vignettes have been validated as a tool for evaluating clinical knowledge and reasoning (52). However, they measure intended rather than actual behavior, and their correlation with real-world practice may vary. Factors such as social desirability bias or oversimplification of clinical context can influence responses. While vignettes are practical for large-scale assessments, future research should complement them with observational methods or clinical audits to better capture real practice.

Limitations

This study has several limitations. First, the use of a self-administered online survey may have introduced self-selection bias, as physiotherapists who were more interested in osteoarthritis (OA) management or evidence-based practice may have been more likely to participate. This could limit the generalizability of the findings. Future research could mitigate this by using random or stratified sampling methods and encouraging broader participation across settings.

Second, social desirability bias may have influenced responses, particularly in the knowledge and vignette sections, where participants might have chosen answers they believed to be more professionally acceptable rather than reflective of their actual practice. To reduce this bias, future studies could incorporate anonymous observational assessments or mixed-method approaches (e.g., interviews or practice audits) to better triangulate self-reported data.

Third, while reversed items were included in the knowledge assessment to reduce acquiescence bias, variations in interpreting these negatively worded items may have led to confusion or inconsistent responses, potentially overestimating knowledge levels. This is a known issue with reversed Likert items, and future questionnaire designs should consider alternative approaches, such as clearer item phrasing or using positively framed statements only.

Fourth, although clinical vignettes provide a standardized and practical method for evaluating clinical reasoning, they primarily assess intended behavior rather than actual practice. Responses in hypothetical scenarios may not always reflect real-world decision-making, and further research should consider combining vignette data with observational or longitudinal data collection.

Finally, temporary external factors, including the residual effects of the COVID-19 pandemic, may have influenced clinical practice, education access, and exposure to OA cases during the data collection period. These factors were not specifically accounted for and may have impacted adherence and knowledge levels.

Future research

Future research should explore the specific barriers to CPG adherence among physiotherapists using qualitative methods. Additionally, intervention studies testing strategies such as audit and feedback, reminders, or educational outreach are needed to identify effective ways to enhance guideline use in clinical settings

Clinical Implications

This study highlights the need for enhanced clinical support to improve physiotherapists' adherence to osteoarthritis (OA) guidelines. Despite high awareness, gaps in adherence suggest the importance of structured continuing education focused on guideline implementation. Targeted mentorship and support are especially needed for those with lower qualifications or limited experience. Workplace factors also influence adherence; thus, governmental and primary care settings require greater organizational investment in evidence-based resources. Increased clinical exposure to OA cases may enhance guideline familiarity, while regional disparities point to the need for tailored, locally driven professional development initiatives.

5. Conclusions

- This study revealed that while many physiotherapists adhere to osteoarthritis clinical practice guidelines, a significant number do not fully implement them in practice.

- Higher adherence was linked to advanced education, clinical experience, OA case exposure, and supportive workplace settings.

- These results highlight the need for targeted education, institutional support, and policy initiatives to close the gap between knowledge and practice. Future research should investigate barriers to adherence and evaluate tailored implementation strategies across diverse physiotherapy contexts.

Abbreviations List:
OA – Osteoarthritis
CPG(s) – Clinical Practice Guideline(s)
RCT(s) – Randomized Controlled Trial(s)
EULAR – European League Against Rheumatism
OARSI – Osteoarthritis Research Society International
NICE – National Institute for Health and Care Excellence
VAS – Visual Analogue Scale
TENS – Transcutaneous Electrical Nerve Stimulation
TECAR – Transfer of Energy Capacitive and Resistive (therapy)
SPSS – Statistical Package for the Social Sciences
MOH – Ministry of Health
SCFHS – Saudi Commission for Health Specialties
STROBE – Strengthening the Reporting of Observational Studies in Epidemiology

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