Adherence to total knee arthroplasty guidelines in Saudi physiotherapists

Adesão às diretrizes de artroplastia total do joelho em fisioterapeutas sauditas

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Abstract

Introduction: Total knee arthroplasty (TKA) is a widely performed surgical procedure for managing advanced stages of knee osteoarthritis. Following clinical practice guidelines (CPGs) is essential to ensure optimal rehabilitation outcomes. **Objective:** To evaluate the level of knowledge and compliance with evidence-based practice guidelines and recommendations related to TKA among physiotherapists in Saudi Arabia. **Methods:** An online cross-sectional survey was administered among licensed physiotherapists practicing in Saudi Arabia who had managed at least one patient undergoing TKA within the past two years. The questionnaire included demographic questions, two clinical vignettes (prehabilitation and acute postoperative rehabilitation), and statements assessing agreement with evidence-based recommendations (EBR). Adherence levels were categorized, and statistical associations with demographic variables were analyzed using chi-square and ANOVA tests. **Results:** The study included 391 physiotherapists (mean age: 31.5 ± 6.1 years), with males comprising 78% of the sample. Only 2 and 3% of participants fully adhered to the EBR in the prehabilitation and postoperative vignettes, respectively. Adherence was significantly associated with gender, years of experience, workplace setting, educational level, specialty, and the number of TKA cases managed ($p < 0.05$). Knowledge gaps were also evident in consensus statements, with less than half agreeing on the use of standardized outcome measures and postoperative management protocols. **Conclusion:** Adherence to TKA CPGs among Saudi physiotherapists is generally low. Experience, workplace setting, and professional background influence adherence. There is a need for targeted educational interventions and systemic support to improve evidence-based practice in TKA rehabilitation.

Keywords: Total knee arthroplasty. Clinical guidelines. Evidence-based practice. Physiotherapy. Saudi Arabia.

Resumo

Introdução: *A artroplastia total do joelho (ATJ) é um procedimento cirúrgico amplamente realizado para o tratamento de estágios avançados da osteoartrite do joelho. Seguir as diretrizes de prática clínica (DPCs) é essencial para garantir resultados ideais de reabilitação.* ***Objetivo:*** *Avaliar o nível de conhecimento e a conformidade com as diretrizes e recomendações de prática baseada em evidências (PBE) relacionadas à ATJ entre fisioterapeutas na Arábia Saudita.* ***Métodos:*** *Um estudo transversal online foi aplicado entre fisioterapeutas licenciados atuantes na Arábia Saudita que haviam tratado pelo menos um paciente submetido à ATJ nos últimos dois anos. O questionário incluiu perguntas demográficas, duas vinhetas clínicas (pré-reabilitação e reabilitação pós-operatória aguda) e afirmações que avaliaram a concordância com as recomendações baseadas em evidências. Os níveis de adesão foram categorizados e as associações estatísticas com as variáveis demográficas foram analisadas por meio dos testes qui-quadrado e ANOVA.* ***Resultados:*** *O estudo incluiu 391 fisioterapeutas (idade média: 31,5 ± 6,1 anos), com homens representando 78% da amostra. Apenas 2 e 3% dos participantes aderiram integralmente às recomendações baseadas em evidências nas vinhetas pré-reabilitação e pós-operatória, respectivamente. A adesão foi significativamente associada ao gênero, anos de experiência, ambiente de trabalho, nível educacional, especialidade e número de casos de ATJ tratados ($p < 0,05$). Lacunas de conhecimento também foram evidentes nas declarações de consenso, com menos da metade concordando com o uso de medidas de desfecho padronizadas e protocolos de tratamento pós-operatório.* ***Conclusão:*** *A adesão aos CPGs para ATJ entre fisioterapeutas sauditas é geralmente baixa. Experiência, ambiente de trabalho e formação profissional influenciam a adesão. Há necessidade de intervenções educacionais direcionadas e suporte sistêmico para aprimorar a PBE na reabilitação de ATJ.*

Palavras-chave: *Artroplastia total do joelho. Diretrizes clínicas. Prática baseada em evidências. Fisioterapia. Arábia Saudita.*

Introduction

Knee pain is a significant public health concern as it impairs mobility and disrupts many daily activities.[1] Although many different conditions can cause knee pain, it is often a sign of osteoarthritis (OA), a disease that is prevalent throughout the world.[2] OA is a widespread and age-related condition and is considered one of the most prevalent conditions that primary care physicians deal with.[3] One of the factors contributing to the fastest increase in years spent disabled is OA. It is also a significant factor in the decline of daily activities, particularly in the elderly and dependent members of the community.[4]

OA of the knee causes medical conditions that place a significant burden on the global healthcare system. It is estimated that after age 60, this disorder affects more than 40% of the elderly.[5] The prevalence of OA varies between 13% and 30% across various regions of Saudi Arabia.[6] One study in Saudi Arabia found that knee OA was highly prevalent, affecting 18.86% of participants (n = 425).[7]

For the treatment of OA, a variety of modalities are available, and it is best to pick the one that best suits each patient. These treatments can be categorized as non-pharmacological, pharmacological, or surgical. Non-pharmacological treatment options include modifying one's lifestyle, engaging in physical activity, losing weight, and using walking aids.[8] Examples of pharmacological treatments include acetami-nophen, nonsteroidal anti-inflammatory drugs, intra-articular corticosteroid injections, and hyaluronic acid options.[9] Surgery is considered for patients who do not experience functional improvement or pain relief from pharmaceutical and non-pharmacological treatments. However, these treatments are often ineffective for severe OA and do not stop disease progression.

Knee OA is treated with a variety of surgical procedures, such as total arthroplasty and high tibial osteotomy. Total knee arthroplasty (TKA) is an effective treatment for severe and progressive OA, as it helps improve patients' conditions primarily by reducing pain.[10] TKA is an orthopedic surgical procedure typically lasting one to two hours, during which the damaged knee joint is replaced with an artificial implant. TKA is widely recognized as a reliable and effective treatment option.[11] It is determined to be a risk-free and economical procedure. TKA also successfully reduces pain and enhances functionality.[12]

The annual number of TKA procedures performed in the Middle East, including Saudi Arabia, has increased significantly in recent years. This is probably due to higher survival rates and high success rates. TKA makes it possible to regain normal knee function, manage pain effectively, and limit daily activities primarily associated with OA.[13]

Physiotherapy (PT) during a hospital stay focuses on mobilization and achieving functional objectives related to hospital discharge. Additional post-discharge PT and exercise-based interventions support functional improvement and re-training; however, the content and duration of these services vary.[14] Due to the recent difficulty in accessing inpatient rehabilitation following TKA, outpatient and home care PT has grown in importance, and over the past 20 years, the average length of stay in acute care following the procedure has steadily decreased over time, currently averaging four days. Finally, research shows that four weeks after TKA rehabilitation, quadriceps muscle strength is lower than preoperative levels and declines immediately after surgery.[15] As a result, the final rehabilitation setting is where the most active rehabilitation is likely to take place. These factors also explain why, during the rehabilitation process, we concentrated on the exercise interventions. To lessen pain and swelling, additional physical modalities may be applied. However, in the post-acute phase, exercise is frequently the main interventional focus.

However, the utilization of non-evidence-based treatments seems to be rising among physiotherapists.[16] Furthermore, awareness of clinical recommendations does not always translate into consistent application in practice, a phenomenon known as the 'evidence-to-practice gap.' The underutilization of evidence in clinical settings is a well-recognized issue, with multiple factors contributing to the limited adoption of clinical practice guidelines (CPGs). Common barriers identified in PT include time constraints, concerns about the generalizability of research findings to individual patients, conflicting patient preferences, and insufficient work-place support.[17,18] Additionally, physiotherapists frequently lack awareness of the most recent CPGs.[19]

Assessing whether physical therapists deliver treatments aligned with evidence-based guidelines in managing musculoskeletal conditions is a crucial step toward promoting evidence-based care across healthcare settings. Numerous studies worldwide have investigated both the awareness of and adherence to CPGs for various musculoskeletal disorders.[20-22] To date, no research has specifically addressed the evidence-to-practice gap in rehabilitation following TKA. Therefore, this study employed a cross-sectional design to investigate the gap between CPGs and actual practice in TKA rehabilitation among physiotherapists in Saudi Arabia.

Methods

The present cross-sectional study is based on an online survey investigating physiotherapists' knowledge of and adherence to TKA CPGs and recommendations in Saudi Arabia. The questionnaire was developed according to the International Handbook of Survey Methodology.[23] Ethical approval for the study was granted by the Scientific Research Ethics Committee at Taif University, Saudi Arabia, under application number 45-084. This study is reported by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.[24]

Participants

Participants were required to provide informed consent to join the study. Eligibility criteria included being employed as a physiotherapist in Saudi Arabia and (2) having seen at least one patient who had a TKA in the previous two years. The study excluded participants if they: (1) were not physical therapists or had Saudi Arabian licenses; (2) were students and interns; (3) refused to fill out the questionnaire or had filled in the questionnaire before.

Sample size estimation

Using calculator.net, we determined that a sample size of 375 participants would achieve a 5% margin of error with a 95% confidence interval. This calculation was based on the population size of 12,544 licensed physical therapists in Saudi Arabia, according to statistics from the Saudi Commission for Health Specialties.

Survey development

The questionnaire was designed using Google Forms and consisted of three sections completed by the participants. Section 1 covered the demographic information: gender, age, highest level of education, region, workplace, experience years, PT specialty, and number of cases dealt with following TKA.

Section 2 covered the clinical vignette, which deals with adherence to CPGs. Clinical scenario 1 (Chart 1) was about a case of pre-habilitation before TKA, in addition to clinical scenario 2 (Chart 2), which was about a case of acute postoperative rehabilitation of TKA. The statement's consensus, which deals with participant understanding and agreement levels of the statements taken from CPGs and recommendations, was discussed in Section 3. Answers on the 5-point Likert scale of 1 ('completely agree') and 2 ('somewhat agree') were deemed to agree with the statements in cases where they were not reversed. On the other hand, responses on the 5-point Likert scale of 3 ('neither agree nor disagree'), 4 ('partially disagree'), and 5 ('completely disagree') were deemed to be at odds with the evidence-based practice (EBP) recommendations.

For the inverted statements, responses of 4 ('partially disagree') and 5 ('completely disagree') on the 5-point Likert scale were considered consistent with EBP recommendations. Conversely, responses of 'completely agree,' 'partially agree,' and 'neither agree nor disagree' were interpreted as inconsistent with EBP principles.

Sections 2 and 3 of the questionnaire were based on CPGs for the management of patients undergoing TKA by physiotherapists. These guidelines are intended to be followed by all licensed and appropriately trained physical therapists involved in TKA rehabilitation. Face validity of the instrument was assessed by a PT professor, who evaluated whether the question-naire accurately measured the intended constructs.[26]

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS), version 23 for Mac. Continuous variables were presented as mean ± standard deviation, while categorical variables were reported as percentages. A p-value of < 0.05 was considered statistically significant. Pearson's chi-square test and one-way ANOVA were employed to assess the impact of demographic variables on adherence outcomes related to clinical vignettes 1 and 2.

Chart 1 - Section 2: Adherence investigation - Clinical vignette 1

Clinical Scenario 1: Pre-habilitation before a total knee replacement

History: F.A. is a 64-year-old woman who was referred to a rehabilitation center 6 weeks before her total knee replacement, to be given a prehab program to both reduce surgery risk as well as lead to better post-surgery recovery.

Physical examination:

- Altered gait (walking) pattern with a reduction in weight-bearing over the left knee
- Standing on a slightly flexed left knee
- Swelling and joint line thickening – 'arthritic looking joint'
- Wasting of the quadriceps muscle
- Poor balance and proprioception
- The range of motion is restricted to no more than 100 degrees of flexion without pain
- Crepitus (noisy) knee joint and patella-femoral joint (knee cap) with flexion
- Reduced muscle strength in the left leg
- Poor core stability
- Pain on palpation along the knee joint line
- Positive special test for meniscal damage

Please choose from the following list which procedures you would implement to manage the patient in this scenario (more options available).

- Reiteration of appropriate footwear, basic diet, and joint supplement advice
- Ice therapy regularly, not just after exercises
- Gentle cycling using a static cycle
- Hydrotherapy (pool-based) exercises
- Advice to the patient to contact the specialist or to go to the emergency room
- Advice to the patient to contact the specialist or to go to the emergency room, starting in the meantime the rehabilitation program
- Protection with a semi-rigid brace
- Protection with a lace-up brace
- Protection with elastic tape (kinesiotaping)
- Manual therapy, including soft tissue massage and trigger point release around the quadriceps and back of the knee
- Basic balance and proprioception exercises

Chart 2 - Section 2: Adherence investigation - Clinical vignette 2

Clinical scenario 2: Acute postoperative rehabilitation of total knee replacement

History: Mr. M was a keen sportsman as a young man, but started getting increasing problems with his knees with age. He therefore had a total knee replacement.

Physical examination: An initial examination 7 days after his surgery showed that Mr. M was able to mobilize with the aid of two sticks. He tended to keep his affected knee in a slightly bent position and was reluctant to take his full weight through the leg. His range of movement was reduced partially due to the excess swelling and weakness in his quadriceps.

Please choose from the following list which procedures you would implement to acutely manage the patient in this scenario (more options available).

- Cryotherapy
- Motor function training (balance, walking, movement, symmetry)
- Postoperative knee range-of-motion exercise
- Immediate postoperative knee flexion during rest for blood loss and swelling
- Neuromuscular electrical stimulation
- Resistance and intensity of strengthening exercise
- Continuous passive motion device use for mobilization
- Postoperative physical therapy supervision
- Gentle cycling using a static cycle
- Hydrotherapy (pool-based) exercises
- Protection with a semi-rigid brace
- Protection with a lace-up brace
- Protection with elastic tape (kinesiotaping)

Results

We were able to reach a total of 391 physiotherapists with a response rate of 100% who completed our survey. They all agreed to participate in the survey after reading the informed consent. Thus, 391 physiotherapists – 305 (78%) males and 86 (22%) females – with a mean age of 31.5 (6.1) years compiled the questionnaire in all its sections and were included in the analysis. All participants were graduates of institutions in Saudi Arabia and had managed between one and five TKA patients in the past two years (n = 198; 50.6%). The demographics of the participants are displayed in Table 1. For clinical vignette 2, responses were categorized as 'following,' 'partially following,' 'partially not following,' and 'not following' to evaluate levels of adherence (Table 2).

Clinical vignette 1

Among the 391 participants, 43% were not following, 55% were partially following, and only 2% were fully following the prehabilitation clinical vignette 1, as shown in Table 1. Age was not significantly associated with adherence ($p = 0.100$, $\eta^2 = 0.015$), though those fully adherent were older on average. Gender was significantly associated ($p < 0.001$, $V = 0.190$), with all fully adherent participants being male. Living region was not significantly associated with adherence ($p = 0.100$, $V = 0.129$). Years of experience showed a significant association ($p < 0.001$, $V = 0.190$); none of those with 1 to 5 years of experience were fully adherent, while those with ≥ 10 years were more likely to be. The work-place setting was significantly related to adherence ($p < 0.001$, $V = 0.267$), with full adherence more common among those in the Ministry of Health and military hospitals. Education level differed significantly ($p = 0.001$, $V = 0.223$), with the most fully adherent participants holding diplomas or bachelor's degrees. Specialty showed a strong association ($p < 0.001$, $V = 0.288$), with orthopedic and general physiotherapists showing higher adherence. Additionally, the number of TKA cases managed was significantly associated with adherence ($p = 0.008$, $V = 0.176$), as participants with experience in more than 20 cases were more likely to fully follow vignette 1.

Clinical vignette 2

A total of 391 participants were categorized by their adherence to the postoperative rehabilitation vignette: 185 (47%) were not following, 89 (23%) were partially not following, 107 (27%) were partially following, and only 10 (3%) were fully following (Table 2).

Table 1 - Demographics of participants (n = 391) by adherence to clinical vignette 1 (Prehabilitation)

Variable	Not following (n = 168)	Partially following (n = 216)	Following (n = 7)	P-value	Effect size (r)
Age*	30.9 (6.0)	31.5 (6.0)	35.8 (1.0)	0.100±	$\eta^2 = 0.015$
Gender					
Male	111 (66.1)	175 (81.0)	7 (100)	<0.001≠	V = 0.190
Female	57 (33.9)	41 (19.0)	0 (0.0)		
Living region					
Central	25 (14.9)	29 (13.4)	0 (0.0)		
Eastern	22 (13.1)	55 (25.5)	3 (42.9)		
Western	88 (52.4)	98 (45.4)	4 (57.1)	0.100≠	V = 0.129
Southern	22 (13.1)	26 (12.0)	0 (0.0)		
Northern	11 (6.5)	8 (3.7)	0 (0.0)		
Years of experience					
1 – 5	119 (70.8)	112 (51.9)	0 (0.0)		
6 – 9	27 (16.1)	40 (18.5)	4 (57.1)	<0.001≠	V = 0.190
≥ 10	22 (13.1)	64 (29.6)	3 (42.0)		
Workplace					
Ministry of Health hospitals	42 (25.0)	105 (48.6)	4 (57.1)		
Primary health centers	7 (4.2)	9 (4.2)	0 (0.0)		
University hospitals	19 (11.3)	21 (9.7)	0 (0.0)	<0.001≠	V = 0.267
Private rehab centers	79 (47.0)	67 (31.0)	0 (0.0)		
Military hospitals	21 (12.5)	14 (6.5)	3 (42.9)		
Highest education level					
Diploma	11 (6.6)	18 (8.3)	3 (42.9)		
Bachelor's	117 (69.6)	142 (65.7)	4 (57.1)	0.001≠	V = 0.223
Some postgraduate	20 (11.9)	25 (11.6)	0 (0.0)		
Master's	17 (10.1)	24 (11.1)	0 (0.0)		
PhD	3 (1.8)	7 (3.2)	0 (0.0)		
Specialty					
Neurology	21 (12.5)	24 (11.1)	0 (0.0)		
Orthopedic	96 (57.1)	116 (53.7)	4 (57.1)		
Geriatrics	4 (2.4)	12 (5.5)	0 (0.0)		
Cardiothoracic	20 (11.9)	13 (6.0)	0 (0.0)	<0.001≠	V = 0.288
Pediatric	21 (12.5)	17 (7.87)	0 (0.0)		
Oncology	0 (0.0)	16 (7.4)	0 (0.0)		
Musculoskeletal	0 (0.0)	4 (1.85)	0 (0.0)		
General	6 (3.6)	14 (6.5)	3 (42.9)		
Number of TKA cases					
1 – 5	92 (54.8)	102 (47.2)	4 (57.1)		
6 – 10	38 (22.6)	46 (21.3)	0 (0.0)		
11 – 15	22 (13.1)	31 (14.3)	0 (0.0)	0.008≠	V = 0.176
16 – 20	12 (7.1)	20 (9.3)	0 (0.0)		
> 20	4 (2.4)	17 (7.9)	3 (42.9)		

Note: *Data presented as n (%), except for age: mean (standard deviation). ≠Pearson chi-square test. ±One-way ANOVA. $p < 0.05$ is considered statistically significant. Effect size (r): Cramér's V for chi-square; η^2 for ANOVA. Interpretation of effect sizes: small ≈ 0.1, medium ≈ 0.3, large ≥ 0.5. TKA = total knee arthroplasty.

Table 2 - Demographics of participants (n = 391) by adherence to clinical vignette 2 (postoperative rehabilitation)

Variable	Not following (n = 185)	Partially not following (n = 89)	Partially following (n = 107)	Following (n = 10)	P-value	Effect size (r)
Age*	23.1 (7.6)	31 (4.0)	29.8 (3.5)	32.1 (3.4)	0.020±	$\eta^2 = 0.041$
Gender						
Male	148 (80.0)	64 (71.9)	82 (76.6)	5 (50.0)	0.500≠	V = 0.103
Female	37 (20.0)	25 (28.1)	25 (23.4)	5 (50.0)		
Living region						
Central	33 (17.8)	12 (13.5)	9 (8.4)	0 (0.0)		
Eastern	33 (17.8)	22 (24.7)	21 (19.6)	4 (40.0)		
Western	89 (48.1)	38 (42.7)	57 (53.3)	6 (60.0)	0.010≠	V = 0.171
Southern	23 (12.4)	9 (10.1)	16 (15.0)	0 (0.0)		
Northern	7 (3.8)	8 (9.0)	4 (3.7)	0 (0.0)		
Years of experience						
1 – 5	119 (64.3)	36 (40.4)	74 (69.2)	2 (20.0)		
6 – 9	19 (10.3)	28 (31.5)	20 (18.7)	4 (40.0)	<0.001≠	V = 0.314
≥ 10	47 (25.4)	25 (28.1)	13 (12.1)	4 (40.0)		
Workplace						
Ministry of Health hospitals	77 (41.6)	34 (38.2)	30 (28.0)	9 (90.0)		
Primary health centers	0 (0.0)	0 (0.0)	15 (14.0)	0 (0.0)		
University hospitals	23 (12.4)	11 (12.3)	10 (9.4)	0 (0.0)	<0.001≠	V = 0.327
Private rehab centers	68 (36.8)	24 (27.0)	52 (48.6)	1 (10.0)		
Military hospitals	17 (9.2)	20 (22.5)	0 (0.0)	0 (0.0)		
Highest education level						
Diploma	11 (6.0)	12 (13.5)	9 (8.4)	0 (0.0)		
Bachelor's	129 (69.7)	43 (48.3)	81 (75.7)	10 (100)	<0.001≠	V = 0.291
Some postgraduate	15 (8.1)	17 (19.1)	13 (12.2)	0 (0.0)		
Master's	27 (14.6)	10 (11.2)	4 (3.7)	0 (0.0)		
PhD	3 (1.6)	7 (7.9)	0 (0.0)	0 (0.0)		
Specialty						
Neurology	32 (17.3)	7 (7.9)	6 (5.6)	0 (0.0)		
Orthopedic	101 (54.6)	42 (47.2)	59 (55.1)	2 (20.0)		
Geriatrics	4 (2.2)	0 (0.0)	12 (11.2)	4 (40.0)		
Cardiothoracic	12 (6.5)	8 (9.0)	13 (12.2)	0 (0.0)	<0.001≠	V = 0.316
Pediatric	15 (8.1)	18 (20.2)	13 (12.2)	0 (0.0)		
Oncology	8 (4.3)	8 (9.0)	0 (0.0)	0 (0.0)		
Musculoskeletal	4 (2.2)	0 (0.0)	0 (0.0)	0 (0.0)		
General	9 (4.8)	6 (6.7)	4 (3.7)	4 (40.0)		
Number of TKA cases						
1 – 5	110 (59.4)	38 (42.7)	52 (48.6)	5 (50.0)		
6 – 10	31 (16.8)	20 (22.5)	34 (31.8)	1 (10.0)		
11 – 15	14 (7.6)	20 (22.5)	17 (15.9)	4 (40.0)	<0.001≠	V = 0.264
16 – 20	8 (4.3)	11 (12.3)	0 (0.0)	0 (0.0)		
> 20	22 (11.9)	0 (0.0)	4 (3.7)	0 (0.0)		

Note: *Data presented as n (%), except for age: mean (standard deviation). ≠Pearson chi-square test. ±One-way ANOVA. $p < 0.05$ is considered statistically significant. Effect size (r): Cramér's V for chi-square; η^2 for ANOVA. Interpretation of effect sizes: small ≈ 0.1, medium ≈ 0.3, large ≥ 0.5. TKA = total knee arthroplasty.

Age showed a significant difference among groups ($p = 0.020$, $\eta^2 = 0.041$), with fully adherent participants being the oldest on average (32.1 ± 3.4 years). Gender was not significantly associated ($p = 0.500$, $V = 0.103$), though the fully adherent group was evenly split between males and females. Living region was significantly associated ($p = 0.010$, $V = 0.171$); most fully adherent participants were from the Western (60%) and Eastern (40%) regions. Years of experience differed significantly ($p < 0.001$, $V = 0.314$); those fully adherent were more likely to have ≥ 6 years of experience, while the non-adherent group had the highest proportion of participants with only 1–5 years.

The work-place setting was significantly associated with adherence ($p < 0.001$, $V = 0.327$), with 90% of fully adherent participants working in Ministry of Health hospitals and none from military or primary health centers. Educational level also showed significant differences ($p < 0.001$, $V = 0.291$), as all fully adherent participants held bachelor's degrees, and none had postgraduate qualifications. Specialty was significantly related to adherence ($p < 0.001$, $V = 0.316$), with geriatrics and general specialties more common among those fully following, while none from neurology, oncology, or pediatrics were fully adherent. Lastly, TKA case volume was significantly associated with adherence ($p < 0.001$, $V = 0.264$); participants who had treated 11–15 TKA cases were more prevalent in the fully adherent group, while those with over 20 cases were mostly in the non-adherent group.

Participants showed varied agreement with clinical practices related to TKA. Less than half (47.3%) supported using standardized outcome measures at the first visit. Most (57.8%) favored starting PT within 24 hours post-surgery. Opinions on treatment modalities were split (50.9% agreement). The majority supported preoperative exercise and education (56.0%) and PT involvement in discharge planning (48.6%). Early mobility had the highest agreement (61.6%), followed by support for both group- and individual-based rehab sessions (52.9%). For prognosis, most participants recognized the importance of considering prognostic factors (81.1%) and the impact of diabetes on outcomes (87.7%) (Table 3).

Table 3 - Reported answers of participants (n = 391) to Section 3

	Statement about assessment	Agreement	Disagreement
Outcome assessment	Should PTs, at least at the first visit, incorporate outcome measures, such as KOOS JR, the 30-second sit-to-stand, and TUG as part of the physical assessment?	185 (47.3)	206 (52.7)
Management	Should PT management not start within 24 hours of surgery for patients who have undergone TKA? (Reversed statement)	165 (42.2)	226 (57.8)
	At least one of the following treatment modalities is strongly recommended in the rehabilitation program for patients who have undergone TKA: (A) Motor function training; (B) Neuromuscular electrical stimulation; (C) Strength training.	199 (50.9)	192 (49.1)
	Should PTs not implement a preoperative exercise program, including strengthening and flexibility exercises, and provide preoperative education for patients undergoing TKA? (Reversed statement)	172 (44.0)	219 (56.0)
	PTs should not provide guidance to the care team and to the patient on safe and objective discharge planning, patient functional status, assistive equipment, and services required to facilitate a safe discharge. (Reversed statement)	201 (51.4)	190 (48.6)
	PTs should develop an early mobility plan and teach patients who have undergone TKA regarding the importance of early mobility and appropriate progression of physical activity, based on safety, functional tolerance, and physiological response.	241 (61.6)	150 (38.4)
	PTs may use group-based or individual-based physical therapy sessions for patients who have undergone TKA.	207 (52.9)	184 (47.1)
Prognosis	PTs should not consider prognostic factors, such as BMI, tobacco use, comorbidities, physical, and psychological function during the management of patients who have undergone TKA. (Reversed statement)	74 (18.9)	317 (81.1)
	Diabetes is not associated with less functional outcomes. (Reversed statement)	48 (12.3)	343 (87.7)

Note: Data presented as n (%). PT = physical therapist; KOOS JR = Knee Injury Osteoarthritis Outcomes Survey Joint Replacement; TUG = Timed Up and Go; TKA = total knee arthroplasty; BMI = body mass index.

Discussion

This survey is the first of its kind to cross national borders and qualitatively evaluate the views and current TKA rehabilitation practices of Saudi physiotherapists who practice in various acute, community, and outpatient settings. The number of TKA procedures has risen significantly over the past 30 years, driven by the increased availability of well-equipped specialty clinics and the presence of highly qualified healthcare professionals, including board-certified surgeons with extensive training. To communicate EBM therapies, CPGs, and evidence-based recommendations are crucial. Physiotherapists must be aware of these guidelines and use them in their therapeutic settings. Our findings showed that 1.79% of the participants were following the guidelines and recommendations regarding TKA rehabilitation, while 55.24% were partially following clinical vignette 1, which was about a case of pre-habilitation before TKA. Regarding clinical vignette 2, which was about a case of acute postoperative rehabilitation of TKA, 2.56% were following the CPGs, and 27.37% were partially following. However, most of the participants were partially not following and not following, with 22.76% and 47.31%, respectively.

During hospital stay, physical therapists often concentrate on the range of motion, muscle building, and gait training. Furthermore, bed mobility and transfers are included in the duties of physiotherapists; these tasks are typically classified as occupational therapy tasks.[27] Evidence shows that physical therapy interventions during the inpatient phase should shift away from the traditional emphasis on stretching and strengthening exercises, which were once commonly used to prepare patients for returning home, and more on daily activities (e.g., walking, chair rising, stair climbing).[28-30]

The present study included a sample of Saudi physiotherapists, 61% of whom have experience from one to five years. In a previous Greek study, 35.6% of the included sample of physiotherapists had more than ten years of experience.[31] However, the Greek study aimed to record standard practices and services available in Greece. Another previous study in Saudi Arabia,[32] that aimed to investigate the application of proprioceptive exercise for post-TKA patients, included a sample of 34% male and 66% female physiotherapists, which is inconsistent with the present study sample (78% males and 22% females). Seventy-one percent of the sample aged from 24 to 30 years, and 68.7% were from the Western region,[32] which is consistent with the present study: mean age of 31.5 (6.1) years, and 49% of the sample from the Western region. Regarding specialty occupation, 57% of the present study sample were orthopedic specialists, while 40.9% of the sample of the previous Saudi study were general physiotherapists.[32]

A Saudi study by Bin Amer et al.,[33] which included health education students from four Saudi universities that offer health education programs, aimed to assess students' knowledge and attitudes toward TKA, acknowledging their role as future health educators. The study revealed that 77.1% of participants were female and 22.9% were male. It is noteworthy that 71.4% of respondents exhibited poor knowledge regarding TKA, while only 5.7% demonstrated a good level of understanding. These findings are consistent with those reported by Al-Mohrej et al.,[34] who conducted a nationwide population-based study in Saudi Arabia and reported similar knowledge gaps among the general public. Furthermore, 76.2% of students in Bin Amer et al.'s study held a neutral attitude toward TKA and its seriousness.[33] These observations may help explain the low levels of knowledge found among participants in our study. Importantly, no consensus was reached on any of the nine evidence-based statements presented in our survey.

There are some limitations regarding the present study. Firstly, this study is observational and utilizes descriptive statistics. Future research with more sophisticated designs (qualitative and mixed-method studies, for example) could look into the causes of TKA rehabilitation CPGs' inability to be implemented, as well as suggestions from the viewpoints of Saudi physiotherapists and patients. Finally, as a survey-based study relying on self-reports from physiotherapists, the analyzed data reflect indirect measures rather than patient-specific information. Consequently, although the results provide clinically useful information, the interpretation should be made with some caution.

Conclusion

Physiotherapists should know and translate CPGs and evidence-based recommendations in their clinical practice. Our findings showed that 1.79% of the participants were following the guidelines and recommen-

dations regarding TKA rehabilitation, while 55.24% were partially following clinical vignette 1, which was about a case of pre-habilitation before TKA.

Regarding clinical vignette 2, which was about a case of acute postoperative rehabilitation of TKA, 2.56% were following the CPGs, and 27.37% were partially following. Further studies employing in-depth qualitative or mixed-method designs are needed to uncover the contextual and professional factors affecting physiotherapists' adherence to TKA guidelines in Saudi Arabia.

Authors' contributions

YAAG, FWA and IMD were responsible for the study conceptualization; ISA, for the investigation and formal analysis; MSA, for the visualization; IMD, for the supervision; YAAG and FWA, for the methodology, data curation and writing of the original draft; ISA, MSA and IMD, for writing, reviewing and editing. All authors actively participated in discussing the results and approved the final version of the manuscript.

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