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REVIEW

Postoperative education for patients after hip/knee arthroplasty: a systematic review with meta-analysis of randomized controlled trials

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ABSTRACT

Introduction: Guidelines often recommend patient education in the management of hip or knee replacement, despite evidence of its effectiveness is scarce. The aim of this study was to assess the effectiveness of postoperative patient education on pain, function, quality of life, and psychosocial issues.

Methods: We performed a systematic review and meta-analysis of RCTs investigating the effects of patient education (alone or in combination with other treatments) compared to usual care delivered after hip/knee replacement. Risk of bias was assessed using the Cochrane Risk of Bias 2.0. Certainty of evidence was established according to the GRADE approach.

Results: We included five trials. We found that patient education likely results in little to no effects compared to usual care in the medium-term on pain (SMD −0.09, 95% CI −0.41-0.22) and quality of life (MD 0.11, 95% CI 0.00-0.22). Similarly, it likely results in little to no effect on anxiety in both short- (MD 1.59, 95% CI −3.16 to −0.02) and medium-term (MD −1.51, 95% CI −3.07-0.05), as well as on depression in the short- (SMD −0.22, 95% CI −0.58-0.15) and medium-term (SMD −0.22, 95% CI −0.55-0.12). In contrast, usual care may improve long-term physical function (SMD 0.64, 95% CI −0.03-1.3).

Conclusion: Postoperative patient education provided no to small benefit on pain, physical function, quality of life or psychosocial issues compared to usual care. Its role may be more impactful when patient-tailored and integrated into multimodal rehabilitation strategies for people after hip/knee arthroplasty.

Keywords: Hip arthroplasty, Knee arthroplasty, Patient education, Pain, Physical function, Quality of life

What is already known about this topic:

- *Patient education is often encompassed in the management of patients following hip or knee arthroplasty, but no systematic reviews have investigated the effects when delivered after surgery.*

What does the study add:

- *Patient education following hip or knee arthroplasty results in no to little effect on pain, physical function, quality of life or psychosocial issues (e.g., depression, anxiety) compared to usual care. There is a need for high-quality trials investigating the effects of postoperative education following HA/KA.*

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Introduction

Hip and knee arthroplasty (THA/TKA, respectively) are two of the most performed orthopaedic surgeries, usually reserved for end-stage osteoarthritis, when conservative approaches have failed (1). The burden of THA/TKA is continuously rising due to the progressive ageing of the population, obesity, and sedentary lifestyle, which leads to an increased utilization of these procedures (1-3).

Despite most patients achieving good clinical outcomes, about 10% of people following THA and 20% of people following TKA report poor outcomes and subjective dissatisfaction due to persistent pain, inability to perform functional activities (e.g., negotiating stairs), and difficulty with a full recovery (4-7).

Beyond the core outcome measures (pain, physical function and quality of life), psychosocial factors (such as anxiety, catastrophizing attitude, wrong beliefs and fear of movement) are often reported among patients in the perioperative period of joint replacement, and seem to be relevant predictors of (poor) outcomes following surgery (8-12). Patient education, defined as "the process of enabling individuals to make informed decisions about their personal health-related behavior" (13), is often recommended by guidelines not only to address psychosocial issues but also to enhance understanding of the postoperative pathway, reduce pain, promote functional recovery, and optimize quality of life (14-16). Patient education is considered capable of improving knowledge about the clinical condition and future perspectives, helping patients following HA/KA to cope with their "new" condition (17,18).

Most systematic reviews explored the role of patient education when delivered before surgery, with conflicting and inconclusive evidence about its effectiveness in improving patients' outcomes after surgery (18-21).

Delivering the education after the surgery may have some advantages as the patient(s) could experience the "new" health condition and receive information and advice more directly related to the topics covered by the educational intervention (e.g., how to cope with postsurgical pain and/or mobility deficits) (22).

Furthermore, cognitive performance—including memory—may be temporarily affected by multiple factors, such as anesthesia (even regional anesthesia), anxiety about the surgery, or the unfamiliar hospital environment, potentially limiting the patient's ability to retain information provided during the preoperative period (23).

To the best of our knowledge, no systematic synthesis of evidence regarding the effects of patient education administered following THA/TKA exists.

This systematic review aimed to assess the effectiveness of patient education on pain, function, quality of life, and psychosocial issues delivered after hip or knee arthroplasty.

Methods

We prospectively registered the study protocol on the PROSPERO database (CRD42024542032) and reported this systematic review following the PRISMA 2020 guidelines (24).

Eligibility criteria

Population

We included randomized controlled trials (RCTs) on adults (i.e., people > 18 years old) following THA or TKA (including unicompartmental) due to osteoarthritis. We excluded studies on people following THA/TKA due to causes other than osteoarthritis, such as avascular necrosis, fractures, or inflammatory diseases. We only considered full-text articles written in English or Italian for final eligibility.

Intervention

We included RCTs focusing on patient education, defined as *"a systematic learning experience in which a combination of methods is generally used, such as the provision of information and advice and behavior modification techniques, which influence the way the patient experiences his illness and/or his knowledge"* (25).

We considered any type of patient education (e.g., face-to-face, app, pamphlet), as long as provided after surgery. We excluded trials focusing on the preoperative or intraoperative stages. We included trials delivering patient education both as a standalone and as a co-intervention with other treatments (e.g., usual care, exercise)

Comparator

We included trials comparing the effectiveness of patient education to (i) usual care (e.g., standard physiotherapy), (ii) no treatment/wait and see.

Outcomes

We included trials investigating at least one of the following primary outcome measures:

- Pain (measured with e.g., visual analogue scale, numeric rating scale, Hip disability and Osteoarthritis Outcome Score (HOOS) (26) subscale "pain", Knee Injury and Osteoarthritis Outcome Score (KOOS) subscale "pain" (27), Western Ontario and McMaster Universities Arthritis Index (WOMAC) subscale "pain" (28);

When multiple outcome measures for pain were reported, we extracted the following measures according to the recommendation of Saadat et al (29), who prioritized: pain overall, pain on stairs, pain at night, pain on walking, pain at rest, WOMAC pain, WOMAC global, and Lequesne index.

- Physical function (e.g., HOOS/KOOS, WOMAC, Six minutes Walking Test (6MWT), Timed Up and Go (TUG) test) (26-28,30,31);
- Quality of Life (e.g., 36-Item Short-Form Health Survey, Short-Form Health Survey 12) (32,33)

We were also interested in the following secondary outcome measures:

- Anxiety (e.g., Beck Anxiety Inventory) (34)
- Depression (e.g., Beck Depression Inventory)
- Kinesiophobia (e.g., Tampa Scale of Kinesiophobia) (35)
- Self-efficacy (e.g., General Self-Efficacy Scale) (36)

We collected outcomes at the following time points:

- short-term – (closest to 1 month after randomization)
- medium-term – (closest to 3 months after randomization)
- long-term – (closest to 12 months after randomization)

Information sources

We searched the Medline (via PubMed), CENTRAL, CINAHL, EMBASE, and Scopus databases from inception to March 15, 2024. We also searched Google Scholar (first 100 records) and Clinicaltrials.gov.

Search strategy

We built the search strategies for each database, adhering to the PRISMA-S guidelines (37). All the search strategies were presented in Appendix A.

Selection process

Duplicated entries were removed through the Deduplicator function of Systematic Review Accelerator software (38). Two independent reviewers (CB and LG) screened the titles and abstracts of the retrieved studies by using the Rayyan software (39). Any disagreement was solved by a third reviewer (LP). We contacted the corresponding author if full texts were not available or in case of unclear information.

Data collection process

Two independent reviewers (CB and LG) independently extracted mean scores and standard deviations (SD) for continuous outcomes; odds ratios (OR) or relative risk (RR) for dichotomous outcomes. When necessary, data from graphs were extracted through the Web Plot Digitizer software (40).

Data items

Three independent reviewers (CB, LG, and LP) extracted through an Excel file the following data: first author, year of publication, country, number of participants allocated to the education and the control group, patient characteristics (age, gender, baseline pain and duration of symptoms), characteristics of the education intervention (e.g., duration, frequency, type of education), type of comparator, and follow-up. When a study was reported through multiple reports, we collected data through different forms and combined them into a single dataset. Any missing data or unclear information was resolved by contacting the corresponding author of the studies.

Study risk of bias assessment

We used the Cochrane revised risk of bias 2.0 tool to assess risk of bias across outcomes (41). ROB 2.0 evaluates the risk of bias according to these domains: bias arising from (i) the randomization process, (ii) deviation from the intended intervention, (iii) missing outcome data, (iv) measurement of the outcome, and (v) selection of the reported results. Each domain was judged with "High risk", "Low risk", or "Some concerns" according to subsequent signaling questions. A pilot session was conducted to familiarize oneself with the tool. Consensus was reached by discussion between the 2 review authors (CB and LG). The RoB graph was created through the RobVis visualization tool (42).

Effects measures and synthesis methods

We calculated mean differences (MDs) if the same measurement instruments were used for the same outcome, and standardized mean differences (SMDs) if different instruments were used for the same outcome (e.g., NRS or VAS for pain).

If variance in outcomes were reported as confidence intervals, inter-quartile ranges, or standard errors, we converted them into standard deviation using the formulas presented in the Cochrane Handbook (Chapter 7.7.3.2) (43). When data were not fully available, the corresponding authors were contacted to obtain missing data. If SD were not reported in the original RCT and could not be obtained through author contact, we performed imputation as recommended by the Cochrane Handbook (Chapter 16.1.3.1) (44): we used the SD of the most similar study (e.g., in terms of number of randomized patients) included in that specific meta-analysis.

If studies were sufficiently homogeneous in terms of clinical context, we performed meta-analyses using a Der Simonian-Laird random-effect model. We used the Review Manager 5 software to calculate the pooled mean difference (MD) or standardized mean difference (SMD), each reported with 95% confidence intervals (95% CI) (45). We examined heterogeneity as a measure of the between-study variation and calculated it as the I^2 statistic, measuring the proportion of variation in the combined estimates due to between-study variance. An I^2 value of 0% indicates that none of the variance in the pooled estimate can be attributed to between-study variance, and an I^2 value of 100% indicates that all of the variance in the pooled estimate is attributable to between-study variance.

We referred to the thresholds suggested by the Cochrane Handbook (44). In case of clinical heterogeneity, which prevented meta-analysis, we presented results descriptively following the synthesis without meta-analysis (SWiM) guidelines (46).

Reporting bias assessment

To assess publication bias, we generated funnel plots for meta-analyses when at least 10 studies were available: we observed the symmetry of each funnel plot to assess the potential presence of publication bias. If fewer than 10 studies were available, we followed the algorithm published on the Core GRADE recommendations (47).

To assess outcome reporting bias, we compared the outcomes specified in trial protocols with the outcomes reported in the corresponding trial publications; if trial protocols were unavailable, we compared the outcomes reported in the methods and results sections of the trial publications.

Certainty assessment

We used the Grading of Recommendation, Assessment, Development and Evaluation (GRADE) approach to assess the overall certainty of evidence, based on the following domains: risk of bias, inconsistency, imprecision, indirectness, and publication bias (48). We evaluated the evidence by using the GRADEpro software (42). We downgraded by

one level if serious limitations or two levels if very serious limitations were identified in any of the domains. The criteria adopted for the assessment of the certainty were summarized in Appendix C. The certainty of evidence was classified as high, moderate, low, or very low (48). The results are presented in a summary of findings table.

Subgroup analysis

We explored statistical heterogeneity by performing subgroup analyses based on the following criteria: (a) hip vs knee arthroplasty, (b) face-to-face vs remote education, and (c) group-based vs individual education.

Clinical relevance

We considered clinically relevant the effect of educational intervention compared to the control group according to the following criteria:

- Pain intensity: an improvement of 20 points on a numeric rating scale of 0-100(50) or a SMD > 0.2 (51);
- Physical function: an improvement of 9.47 on a 0-100 scale (52) or a SMD > 0.2 (51);
- Quality of life: an improvement of 20% or an SMD > 0.2 (51).
- Psychosocial variables; an improvement of 20% or an SMD > 0.2 (51).

Results

Study selection

We retrieved 749 records: 506 from databases and registers, 100 from Google Scholar, and 143 from ClinicalTrials.gov. After removing duplicates (n = 231), we screened 518 records by title and abstract and read the full text of 41 trials. Finally, we included six trials encompassing 498 patients (36,9% men, mean age 69.0 years) (Fig. 1) (53-58). We detailed the reasons why all potentially relevant trials were not included in our review in Appendix B.

Study characteristics

We summarized the main characteristics of the included trials in Table 1. Two trials were conducted in the Netherlands (53,54), one in China (58), Taiwan (55), Turkey (56), and the United States (57).

In three trials, education was delivered through an app (53,54,58). In the other two trials, education was delivered through a video (55,56). Pellegrini et al. delivered an in-person educational intervention (57). Five trials collected data at short-term (i.e., closest to one month after randomization) (53-56,58), whereas four trials at medium-term follow-up (i.e., closest to three months after randomization) (55-58). No trials had data at long-term follow-up.

One trial was judged at low risk of bias (58). The other five trials were judged at an overall high risk of bias (Fig. 2) (53-57). We summarized the most credible findings (i.e., results with moderate to high-certainty evidence) in the evidence profile table (Table 2). All results are reported descriptively in the following paragraphs.

Results of synthesis

Pain

Three trials (n = 300) investigated the role of patient education on short-term pain. Patient education may result in a slight reduction compared to usual care (MD −5.19, 95% CI −13.01–2.63, I^2 = 61%) (53,54,56) (Fig. 3).

Three trials (n = 158) investigated the role of patient education on medium-term pain intensity: Patient education likely results in little to no difference compared to usual care (SMD −0.09, 95% CI −0.41–0.22, I^2 = 0%), (57,58) (Fig. 4).

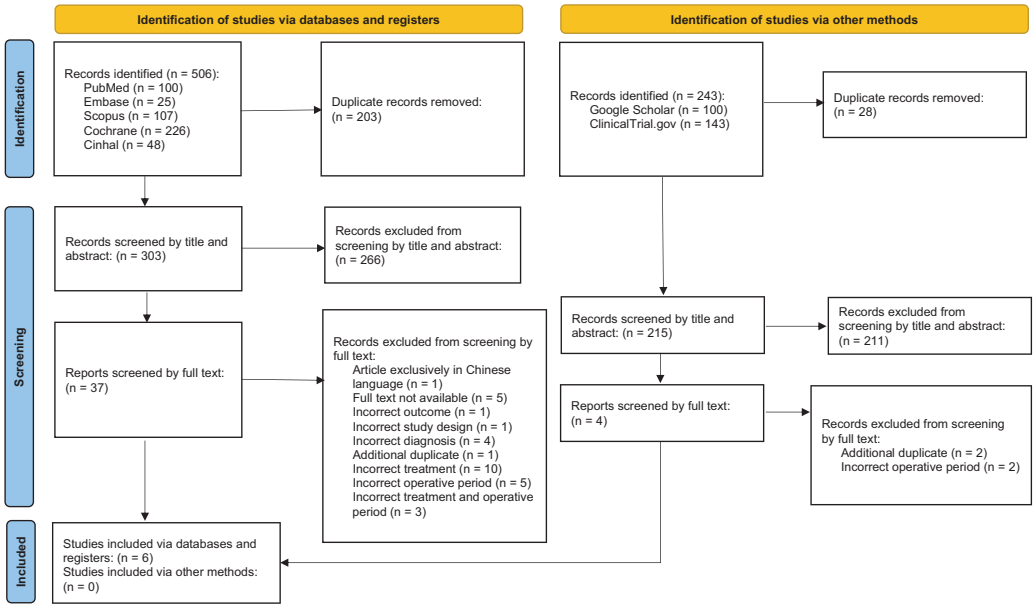

FIGURE 1 - Flow of trials through the review.

TABLE 1 - Characteristics of the included studies

Study	Type of surgery	Experimental		Control		Outcomes	Follow up (weeks)
		Sample characteristics	Type of intervention	Sample characteristics	Type of intervention		
Chang 2024 (55)	Knee	n = 26 age 73.4 (5.5) M / F (%) 6 / 20 (23.07%) Pain 52.7 (23.9) Physical function 62.6 (16.9) QoL 24.5 (17.5)	Educational Video + Pamphlet D = 4 months N sessions = NR S = 30’	n = 26 age 73.5 (4.7) M/F (%) 10 / 16 (38.46%) Pain 55.6 (19.0) Physical function 60.7 (20.8) QoL 21.6 (14.5)	Standard rehabilitation D = NR N sessions = twice daily S = NR	Physical function = KOOS (0-100) Depression = GDS-SF (0-15)	1, 6, 12, 16
Eren 2022 (56)	Hip	n = 13 age 49.61 (9.52) M / F (%) 4 / 9 (30.77%) Pain NR Physical function NR	Video-assisted education D = 12 weeks N sessions = NR S = NR	n = 18 age 55.33 (11.83) M / F (%) 6 / 12 (33.3%) Pain NR Physical function NR QoL NR	Physiotherapy D = N sessions = NR S = NR	Pain = VAS (0-10) Physical function = HHS (0-100) ADL (NEADL) Kinesiophobia (TSK)	1, 12
Pellegrini 2022 (57)	Knee	n = 24 age 67.2 (5.4) M/F (%) 8/16 (30%) Pain 54.3 (15.4) Physical function 27.1 (12.2) QoL 38.3 (18.4)	Education + standard physiotherapy D = NR N sessions = NR S = NR	n = 21 age 63.3 (8.1) M/F (%) 10/11 (47.6%) Pain 59.3 (15.4) Physical function 21.5 (10.4) QoL 42.3 (19.5)	Standard physiotherapy D = NR N sessions = NR S = NR	Pain = WOMAC/ KOOS (0-100) Physical function = KOOS (0-100)	12
Pronk 2020 (54)	Knee	n = 38 age 62.6 M/F (%) 23 / 15 (60.52%) Pain 33.0 (48.68) Physical function 47.3 (20.83) QoL 86.0 (31.49)	Paincoach App	n = 33 age 64.6 M/F (%) 19/14 (57.57%) Pain 32.0 (44.0) Physical function 48.5 (24.82) QoL 86.0 (30.32)	Usual care D = N sessions = 7/week S =	Pain = VAS (0-100) Physical function = KOOS (0-100) Quality of life = EQ-5D	4
Timmers 2019 (53)	Knee	n = 114 age 64.74 M/F (%) 40/74 (35.08%) Pain 5.20 (NR) Physical function 45.91 (12.77) QoL 0.67 (0.21)	Customized and active education via Mobile APP	n = 99 Age 65.63 M/F 39/60 (39.39%) Pain 5.54 (NR) Physical function 43.83 (10.87) QoL 0.65 (0.24)	Basic information	Pain = NRS (0-10) Physical function = KOOS (0-100) Quality of life = EQ5D	4
Wang 2023 (58)	Mixed	n = 43 age 63.0 (14.42) M/F (%) 11/32 (25.58%) Pain 2.00 (5.00) Physical function 62.92 (21.24) QoL 0.45 (0.24)	Mobile APP + usual care D = 6 weeks N sessions S = NR	n = 43 age 66.25 (18.18) M/F (%) 8/35 (18.6%) Pain 2.00 (4.00) Physical function 63.10 (19.89) QoL 0.51 (0.21)	Usual care D = 6 weeks N sessions = 15 (5/week) S = NR	Pain = NRS (0-10) Physical function = HOOS/KOOS (0-100) Quality of life = EQ5D Anxiety (HADS-A) (0-21) Depression (HADS-D) Self-efficacy	6, 10

n = number of participants randomized (number of participants completing the study); VAS = visual analogue scale; D = duration of treatment; S = duration of each session; NR = Not Reported; PT = physiotherapy; NRS = Numeric Rating Scale; HOOS = Hip disability and Osteoarthritis Outcome Score; KOOS = Knee disability and Osteoarthritis Outcome Score
Mean age is presented with standard deviation within round brackets.

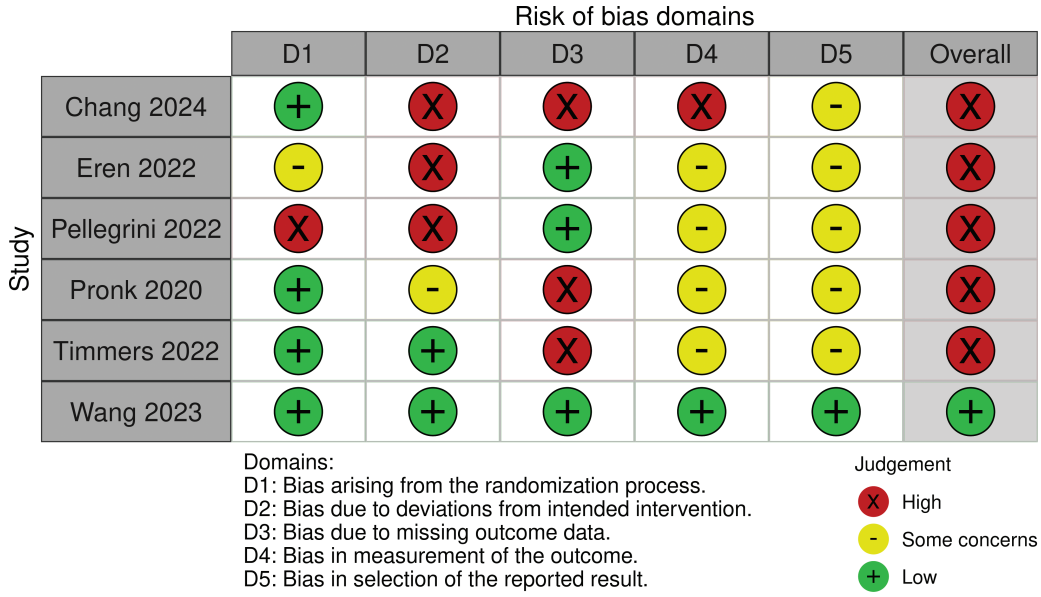

FIGURE 2 - Risk of bias table for each trial included in the review.

Physical function

All the included trials investigated the role of patient education on physical function (53-58).

Three trials (n = 321) investigated the role of patient education on short-term physical function (53-55). The evidence is very uncertain about the effect of patient education (MD −1.88, 95% CI −7.27–3.52, I^2 = 72%) (Fig. 5).

Four trials (n = 209) investigated the role of patient education on medium-term physical function (55–58). Usual care may result in an increase compared to patient education (SMD 0.64, 95%CI −0.03-1.30, I^2 = 80%) (Fig. 6).

Quality of Life

Three trials (n = 355) investigated the role of patient education on short-term quality of life (53,54,58). Patient education may result in no difference when compared to usual care (MD 0.06, 95% CI −0.01-0.13, I^2 = 70%) (Fig. 7). One trial (n = 86) reported that usual care likely results in little to no difference in medium-term quality of life compared to patient education plus usual care (MD 0.11, 95% CI 0.00-0.22) (58).

Psychosocial factors

Two trials (n = 137) investigated the role of patient education on depression (55,58). Patient education likely reduces both short-term (SMD −0.22, 95% CI −0.58-0.15, I^2 = 13%) (Fig. 8) and medium-term depression slightly (SMD -0.22, 95%CI -0.55 to 0.12, I^2 = 0%) (Fig. 9).

One trial focused on anxiety and self-efficacy (58). Patient education likely reduces short-term (MD −1.59, 95% CI −3.16 to −0.02) or medium-term anxiety (MD −1.51, 95% CI −3.07-0.05).

Subgroup analysis

Hip arthroplasty

Only one trial investigated the role of patient education compared to usual care after THA (56). Patient education may result in no difference on short-term (MD −0.04, 95% CI −1.69-1.61) or medium-term pain (MD 0.97, 95% CI −2.59-0.65).

Usual care may result in an increase in medium-term physical function (MD 20.25, 95% CI 7.46-33.04).

Knee arthroplasty

Two trials (n = 269) (53,54) investigated the role of patient education on pain and quality of life, whereas three trials (n = 321) (53-55) focused on physical function after TKA in the short-term. Patient education may result in a reduction in pain (SMD −0.33, 95% CI −0.76-0.10, I^2 = 61%) and increase in physical function (MD −1.88, 95% CI −7.27-3.52 I^2 = 72%), whereas little to no difference in quality of life (MD 0.04, 95% CI −0.04-0.13, I^2 = 80%).

One trial (n = 41) displayed small effects of patient education on medium-term pain (MD −0.60, 95% CI −2.68-1.48) (57).

Two trials (n=92) investigated the role of patient education on physical function after TKA at medium-term (55,57). Patient education may result in no effects compared to usual care (MD 0.76, 95% CI −0.59-2.10, I^2 = 80%).

Face-to-face vs remote/digital

Five trials delivered patient education through an off-site approach (e.g., video, app) (53-56,58). One trial delivered patient education with face-to-face sessions between clinicians and patients (57).

Patient education delivered through video/app probably results in little to no effect on medium-term pain (MD −0.16, 95% CI −0.86-0.54, I^2 = 23%) (Fig. 10), whereas usual care probably increases medium-term physical function (SMD 0.83, 95% CI −0.03-1.70, I^2 = 84%) (Fig. 11).

Group vs individual education

We did not perform any subgroup analysis since no studies focused on group-based education.

TABLE 2 - Summary of findings table—evidence quality (GRADE assessment)

Comparison: Patient education versus no intervention – overall					
Outcome	**# studies**	**N**	**Effect (95% CI)**	**Reason(s) for downgrading**	**GRADE**
Pain					
1 month	3	300	MD −0.97 (−1.53 to −0.51)	RoB, Imprecision	Low
3 months	3	158	SMD −0.09 (−0.41-0.22)	Imprecision	Moderate
Physical function					
1 month	3	321	MD −1.88 (−7.27-3.52)	RoB, Inconsistency, Imprecision	Very low
3 months	4	209	SMD 0.64 (−0.03-1.30)	Imprecision	Low
Quality of Life					
1 month	3	355	MD 0.06 (−0.01-0.13)	RoB, Imprecision	Low
3 months	1	86	MD 0.11 (0.00-0.22)	Imprecision	Moderate
Anxiety					
1 month	1	86	MD −1.59 (−3.16 to −0.02)	Imprecision	Moderate
3 months	1	86	MD −1.51 (−3.07-0.05)	Imprecision	Moderate
Depression					
1 month	2	137	SMD −0.22 (−0.58, 0.15)	Imprecision	Moderate
3 months	2	137	SMD −0.22 (−0.55, 0.12)	Imprecision	Moderate
Comparison: Patient education versus no intervention – hip arthroplasty					
Outcome	**# studies**	**N**	**Effect (95% CI)**	**Reason(s) for downgrading**	**GRADE**
Pain					
1 month	1	31	MD −0.04 (−1.69-1.61)	RoB, Imprecision	Low
3 months	1	31	MD 0.97 (−2.59-0.65)	RoB, Imprecision	Low
Physical function					
3 months	1	31	MD 20.25 (7.46-33.04)	RoB, Imprecision	Low
Comparison: Patient education versus no intervention—knee arthroplasty					
Pain					
1 month	2	269	SMD −0.33 (−0.76, 0.10)	RoB, Imprecision	Low
3 months	1	41	MD −0.60 (−2.68, 1.48)	RoB, Imprecision	Low
Physical function					
1 month	3	321	MD −1.88 (−7.27, 3.52)	RoB, Imprecision	Low
3 months	2	92	MD 0.76 (−0.59, 2.10)	RoB, Imprecision	Low
Quality of life					
1 month	2	269	MD 0.04 (−0.04, 0.13)	RoB, Imprecision	Low
3 months	1	86	MD 0.11 (0.00, 0.22)	RoB, Imprecision	Low

Table 2: We presented in bold the results that achieved statistical significance. Negative values of MD/SMD indicate a superiority of patient education, whereas positive values indicate a superiority of the control intervention.
MD = Mean difference; N = Number of subjects; SMD = Standardized mean difference; RoB = Risk of Bias

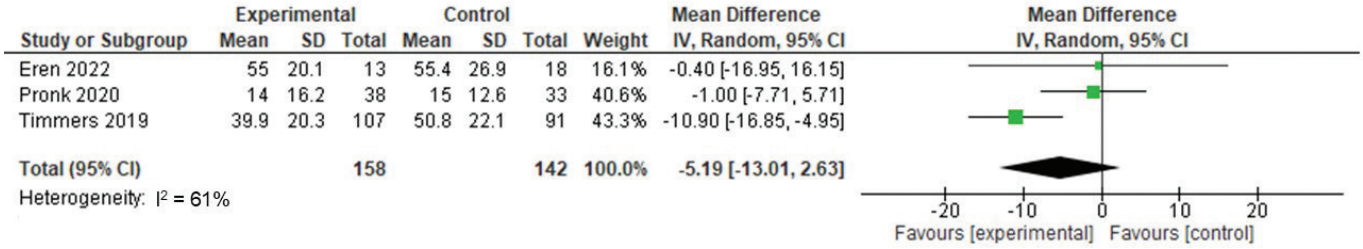

FIGURE 3 - Forest plot of the comparison of patient education versus usual care on short-term pain.

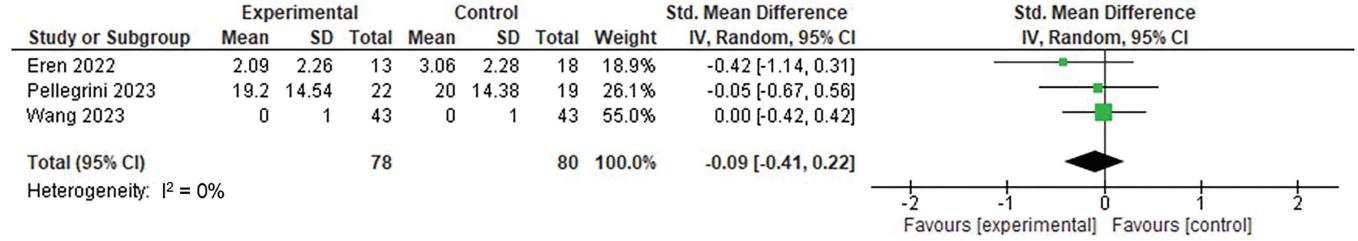

FIGURE 4 - Forest plot of the comparison of patient education versus usual care on medium-term pain.

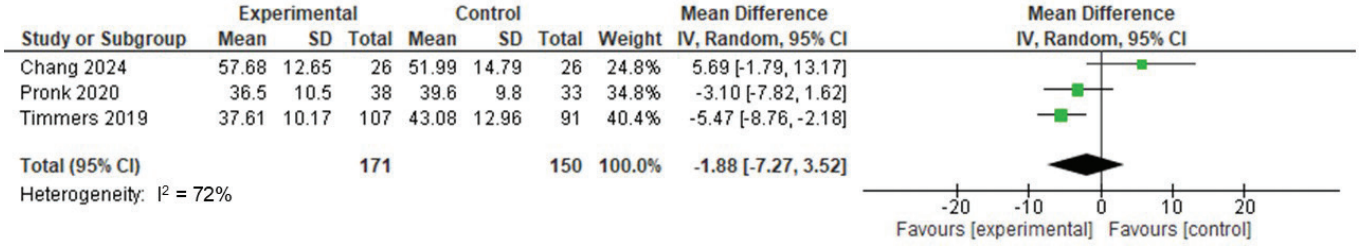

FIGURE 5 - Forest plot of the comparison of patient education versus usual care on short-term physical function.

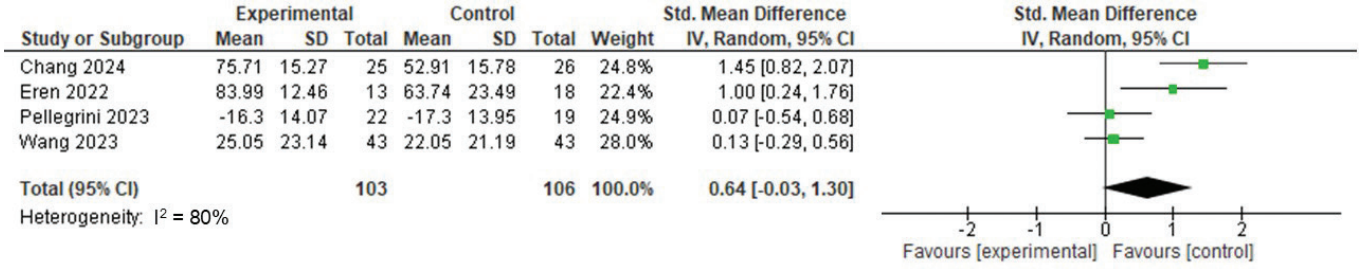

FIGURE 6 - Forest plot of the comparison of patient education versus usual care on medium-term physical function.

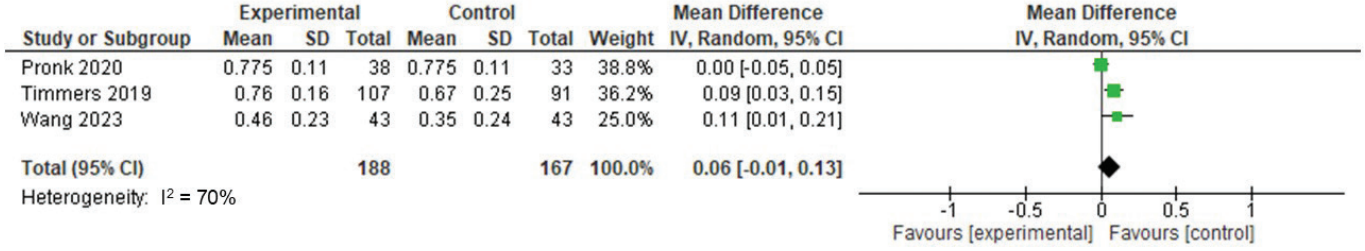

FIGURE 7 - Forest plot of the comparison of patient education versus usual care on short-term quality of life.

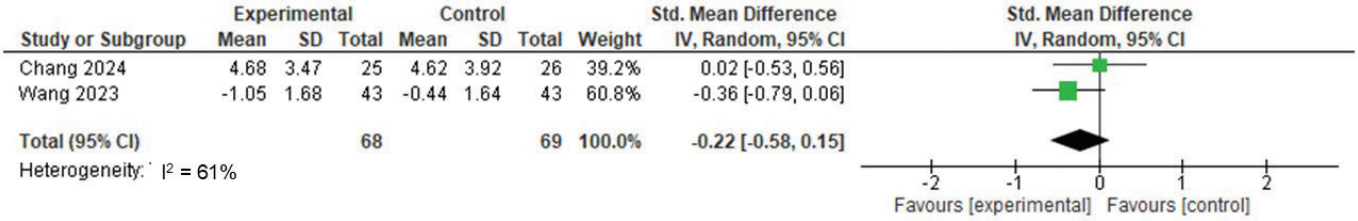

FIGURE 8 - Forest plot of the comparison of patient education versus usual care on short-term depression.

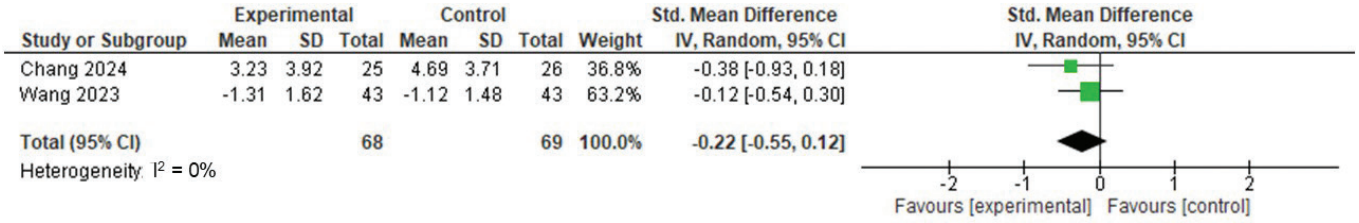

FIGURE 9 - Forest plot of the comparison of patient education versus usual care on medium-term depression.

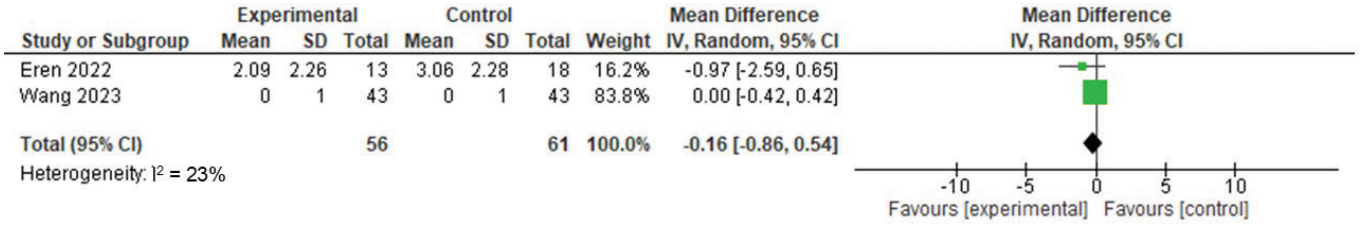

FIGURE 10 - Forest plot of the comparison of patient education delivered face-to-face vs remote on medium-term physical function.

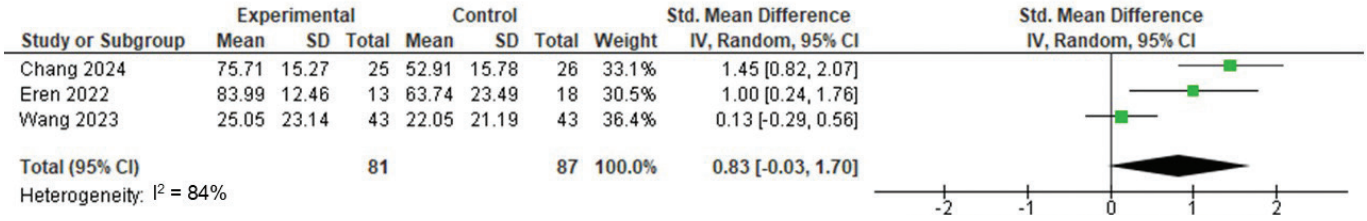

FIGURE 11 - Forest plot of the comparison of patient education delivered face-to-face vs remote on medium-term depression.

Discussion

This systematic review focused on the effects of patient education compared to usual care delivered to patients following THA/TKA on pain, physical function, and quality of life.

We found moderate certainty evidence that patient education had small or no effects on medium-term pain and quality of life, and both short- and medium-term anxiety and depression. We also found from low to very low certainty of evidence that patient education had no small or no effects compared to usual care on disability, short-term pain and quality of life.

Subgroup analyses did not modify our findings, with low-quality evidence for each group (i.e., THA vs TKA, face-to-face vs remote education, individual vs group-based education).

This is the first systematic review investigating the effects of patient education administered following THA/TKA, so we are not able to contrast our findings with other studies. Extending to other studies delivering education before joint surgery, particularly to the Cochrane by MacDonald et al., patient education does not seem to provide a relevant benefit when compared to no intervention (18). These findings should be contextualized in a scenario where the included trials had several limitations: high risk of bias and low sample sizes were common features of the included studies.

The included trials did not adequately report the content (what), the intensity (how much), the duration (how long), and the frequency (how often) of the educational intervention, preventing the opportunity to draw definitive conclusions. In addition, most of the included trials investigated

the effects of standard patient education for all THA/TKA patients: only Timmers et al (53) used an interactive APP that delivered tailored education to patients after TKA. The other trials did not employ customized methods of education: this issue did not likely address the need for a more tailored and patient-centred care advocated by several studies and initiatives (59-62). A personalized approach might be desirable (above all after surgery) to satisfy the patient's needs of knowledge about the short- and long-term recovery, discussing the capability to return to pre-surgery activities, such as activities of daily living, work and also return to sport. The return to potentially higher-demanding activities (e.g., physical work, sports activity) seems to justify the need for a tailored approach, also in the context of the rising number of arthroplasties earlier in life and in active elderly people (63).

Guidelines often recommend patient education as part of a multimodal approach, although weak evidence of effects exists (15,16): beyond the (questionable) clinical effectiveness, patient education might be recommended due to ethical implications, since it is reasonable for clinicians to maintain patient education in the context of the therapeutic relationship with patients following THA/TKA.

Limitations

Our systematic review is not free from limitations, which must be considered. The research question focused on the core outcome set for people with osteoarthritis, and on psychosocial factors (e.g., self-efficacy, anxiety) as secondary outcomes. However, patient education could better impact on other variables, focusing on patients' perspectives, such as patients' satisfaction or compliance with treatment (64,65).

Secondly, almost all trials included in our review administered education through a remote method (e.g., pre-registered video, app): this issue should be discussed since it prevents the delivery of a more interactive and tailored education which may be more "customized" and patient-centred compared to a "standardized" approach, with likely effects on patient's recovery (61,66).

Implications for practice and research

Patient education is often recommended by guidelines to improve patients' involvement, adherence to therapy and commitment (15,16), although the clinical evidence does not justify this approach as a standalone opportunity for people following joint replacement. Clinicians should consider the potential effects of patient education as a complementary intervention to usual care to promote patients' engagement and empowerment (67).

Future research is needed to address the current limitations of the existing literature. The quality of reporting is scarce, as well as the extent of published literature (all comparisons did not achieve the threshold of 400 subjects), focusing on one-to-one patient education, the approach most commonly adopted by clinicians in their clinical practice. We suggest future trialists use appropriate tools such as the Template for Intervention Description and Replication (TIDieR) to better describe the characteristics of education (58), as recommended in the context of other systematic reviews about patient education, although delivered towards a different population (i.e., low back pain patients) (69,70).

Furthermore, we hypothesize that some patients—like those with depression symptoms, anxiety, poor self-efficacy, or kinesiophobia—may benefit from educational intervention more than others. Therefore, researchers should reflect on the opportunity to address educational interventions to "well-selected" patients, planning the trial(s) on a specific population (i.e., patients with a relevant psychosocial burden).

Conclusions

Postoperative patient education provided uncertain clinical relevance compared to usual care on pain, physical function, and quality of life, but may be part of a multimodal approach for people after THA/TKA. High-quality and future studies are needed to improve the sample size and the quality of current evidence.

Disclosures

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LP, CB, LG, and AO were involved in the data collection. LP was involved in the drafting of the manuscript. AO, AD and MT provided methodological competencies.
All authors contributed to the interpretation of the data for the work and revised it critically for important intellectual content.
All the authors finally approved the manuscript. LP was responsible for the integrity of the work as a whole.
All authors have read and agreed to the published version of the manuscript.

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