TITLE PAGE]

Manuscript title

Evaluation of hip precautions following total hip replacement: a before and after study

Running heading

Hip precautions after hip operation (HippityHop)

Article category

Research paper

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Declaration of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Author contributions

CL, KS, CC, GD, and AD were involved in study conception and design. CJL collected and cleaned the data with assistance from JA. CJL, CC, and AD performed data analysis and CJL wrote the first draft of the manuscript. All authors were involved in data interpretation and critically revised the manuscript and gave final approval for submission.

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Implications for Rehabilitation (2-4 bullet points)

- The use of no hip precautions resulted in no additional benefit following primary total hip replacement surgery in terms of functional recovery.
- Patients who were not prescribed precautions had significantly less pain and greater function during the first week after surgery.
- Total hip replacement patients had similar outcomes at six weeks and three months postoperatively regardless of whether they received hip precautions or not.
- The study provides evidence to suggest that hip precautions may not be needed following elective primary total hip replacement.

[MAIN DOCUMENT]

[ABSTRACT]

Purpose

To evaluate the effect of hip precautions following total hip replacement by comparing outcomes of patients who received hip precautions with those who did not.

Methods

Before (phase 1) and after (phase 2) study with two consecutive cohorts of patients. In phase 1, patients were strictly educated about hip precautions. In phase 2, patients were not advised about precautions but encouraged to move as able. The primary outcome was the Oxford Hip Score (measuring pain and function) at three months. Secondary outcomes included Oxford Hip Score, activities of daily living (Nottingham Extended Activities of Daily Living), sleep (Pittsburgh Sleep Quality Index), mood (Hospital Anxiety and Depression Scale), and quality of life (EQ-5 D).

Results

237 participants successfully underwent total hip replacement surgery, 118 participants in phase 1 and 119 in phase 2. At three months postoperatively, participants had significantly equivalent Oxford Hip Scores (MD= -0.82, 95%CI: -2.64 to 1.00). No significant differences between the groups were observed at six weeks and three months postoperatively for secondary outcomes.

Conclusion

Patients recovered at a similar rate regardless of whether they received hip precautions or not, with no increase in complications observed. The findings lend evidence to support decision-making around the removal of precautions.

[KEY WORDS]

Hip precautions, total hip replacement, functional outcomes, quality of life, rehabilitation

[MAIN ARTICLE]

Introduction

Following total hip replacement surgery, hip precautions are routinely prescribed to reduce the risk of dislocation (a major postoperative complication). These are safeguards designed to restrict movements that may compromise the stability of the new joint (e.g. flexing the hip more than ninety degrees, adduction, and rotation), which are applied in everyday life such as getting dressed and bathing. However, a Cochrane review [1], two systematic reviews [2,3], and studies examining the removal of precautions following total hip replacement (THR) in anterolateral [4-7], posterolateral [8], and posterior [9] approaches to THR surgery have concluded that hip precautions do not reduce hip dislocation. However, there is still uncertainty surrounding these conclusions as complications are rare, with dislocation only affecting 1.4% of patients who have undergone THR surgery by 18 months post-operatively [10]. Despite this low percentage, hip dislocation is a major reason for revision [11], with approximately 16% of revision surgery performed for dislocation [12].

Despite marked advancements in surgical techniques and prosthesis development [13-15], a large proportion (97%) of hospitals in the UK routinely still provide hip precautions [16,17].

However, a debate on the 'abolishment of hip precautions after surgery' at the Chartered Physiotherapists' conference in 2016 suggested that clinicians across the UK favoured their removal following THR [18]. The hesitation to withdraw hip precautions is likely to be because of concern that much of the evidence is low-quality due to methodological issues, such as the lack of an acceptable control group and absence of fidelity checks. There is also concern that studies which used dislocation rate as their primary outcome were underpowered because of the low dislocation rates nationally. The incidence of dislocation is low nationally due to more recent advances in the surgery (including the use of larger diameter articulations) [19], and the number of participants that would be required to demonstrate a difference would be difficult to recruit and would require prolonged follow-up. Power calculations suggest that over 4000 participants would be required to show a significant difference between the groups [20]. It is also increasingly recognised that other outcome data, particularly patient-reported outcomes (such as pain and function) are equally important measures after THR [21]. Moreover, it has been suggested that hip precautions may have adverse effects such as slowing down recovery and return to daily activities [5,7], incur significant expense [6], and result in decreased patient satisfaction [2,6].

Given that the existing literature shows the application of hip precautions to have no particular influence on the rate of dislocation, the aim of this study was to evaluate the effect of hip precautions following elective THR on patient reported outcomes. The primary objective was to show that the use of no hip precautions were equivalent (neither inferior nor superior) to hip precautions using the Oxford Hip Score at three months postoperatively. Secondary objectives were to compare quality of life (QoL), functional performance, pain, sleep, mood, and satisfaction between two groups of patients who either received routine hip precautions or no routine hip precautions.

Methods

Study design

The study was a before (phase 1) and after (phase 2) observational study design with two consecutive cohorts of patients modelled around the change in delivery of orthopaedic service to patients following THR. The study uses an equivalence design to show comparative efficacy between the two treatments delivered [22], hip precautions (phase 1) and no hip precautions (phase 2); in other words, having no hip precautions was no better or worse to using hip precautions [23]. The study was conducted in the Nottingham Elective Orthopaedic Service at Nottingham City Hospital campus, Nottingham University Hospitals (NUH) NHS Trust, between January 2017 and August 2018.

Whilst a randomised controlled trial (RCT) would have been the preferred method to evaluate hip precautions, this design was impractical in our setting as education and supply of equipment was service based and extended from preoperative assessment clinics to the community. It would have therefore been unrealistic to provide hip precautions for half the sample and not for others across the whole pathway, as there would be the potential for widespread contamination and protocol infringement. Also, extensive discussions with staff suggested that, in practice, they would have found an RCT impossible to administer as they worked across wards. A multicentre clustered RCT was not feasible; we had previously discussed conducting a multicentre RCT with several hospitals, but they were not willing to be randomised. The protocol for this study (HippityHop) has been published [23].

Ethics

Approvals were obtained from Nottingham 2 Research Ethics Committee (REC) - East Midlands (16/EM/0283), the Research and Innovation department of Nottingham University Hospitals NHS Trust (16HC005), and the Health Research Authority (HRA).

Participants and recruitment

All potential participants listed for an elective THR were sent a participant information sheet with their preoperative assessment appointment letter. Eligible patients were approached at their preoperative assessment by a clinician and invited to discuss the study in detail with the site researcher (CJL). Those who wanted to participate gave written informed consent.

Participants were eligible for the study if they: (a) were 18 years or over; (b) were scheduled for an elective primary THR; and (c) provided written informed consent. We excluded those who did not speak or read English; (b) had a previous history of revision surgery on either hip; (c) were admitted for 'complex' surgery (as defined by the surgeon, but typically involved bone grafting) or revision surgery; or (d) had dementia documented in their medical notes. All participants provided written informed consent for the collection of their data, including access to their medical notes and for follow-up assessment. Participants undergoing surgery were recruited into either phase 1 or phase 2, depending on the timing of their surgery in relation to the change in service.

Procedure

Participant assessment occurred preoperatively (following preoperative assessment appointment) and one-week, six weeks, and three months postoperatively. At their preoperative appointment, participants were invited to complete a questionnaire booklet (baseline) which included outcome measures (Oxford Hip Score, Nottingham Extended Activities of Daily

Living, Pittsburgh Sleep Quality Index, Hospital Anxiety and Depression Scale, and EQ-5D-5L), and supplementary questions regarding sleep, such as 'what position do you normally prefer to sleep in?' and 'are you currently sleeping in your preferred position? If not, why not?'. At one-week post-surgery, participants were contacted by phone to complete the OHS questionnaire and asked about any specific difficulties. At six weeks and three months post-surgery, participants were asked to complete follow-up questionnaire booklets, which included baseline outcome measures. Additional questions on whether patients: had dislocated their hip; had had revision surgery; were currently taking any pain relief/painkillers or sleeping medication; had been admitted to hospital were also included. They were also asked about satisfaction with treatment. Booklets were sent by post with a request to return these in freepost envelopes.

Baseline and demographic characteristics were collected at the time of enrolment (prior to surgery) and included age, gender, and living arrangements. Following surgery, medical (e.g. key medication, comorbidities) and surgical (e.g. side of operation, type of surgical approach) data and information relating to deaths, falls, and hip dislocations were also collected.

A member of the research team (KRS) specifically monitored dislocation rates for the duration of the study (three months postoperatively). In addition, the Trauma and Orthopaedic Audit Office, Nottingham University Hospitals NHS Trust, assisted with safety surveillance and they also verified medical data on any dislocation, and treatment.

In phase 1, patients were taught hip precautions which involved education about specific hip joint movements to avoid (that is flexion beyond 90 degrees, adduction, and rotation) and practising activities of daily living (ADLs) within these movement restrictions, such as getting

on and off chairs. A standard package of equipment was provided which included a raised toilet seat. In phase 2, hip precautions were not taught. The new regime was an individualised approach to rehabilitation that encouraged patients to move as they were able, within a comfortable range of motion and as pain allowed. Specialist equipment was only provided to those patients who required it, following clinical assessment. Between the two phases of the study, there was a 'washout' phase, which was necessary to ensure the staff had time to adjust to the second intervention (regime of no hip precautions) and any habitual application of the first intervention (hip precautions) ceased. This phase was designed to ensure there was no contamination of the second group with the first intervention. Data were not collected during this period. Data collection commenced when staff were confident about delivering the intervention and optimal treatment was being delivered.

A number of clinicians were recruited from each clinical team, consisting of senior physiotherapists, senior occupational therapists, nurse practitioners and ward sisters, to be 'hip champions'. Their role was to ensure that all staff were adhering to the delivery of the no hip precautions regime in the washout phase and in phase 2, and to monitor treatment fidelity. Hip champions also assisted with identifying any deviations from the protocol, educating the clinical staff, and notifying the researchers of any issues raised or identified.

As there was a change in service delivery, it was important to monitor fidelity to the no precautions regime, particularly as previous studies had failed to do this. Treatment fidelity was monitored during the washout phase and in phase 2 to ensure that hip precautions were not being prescribed to patients. The delivery of treatment was not formally monitored prior to the change in the orthopaedic services as hip precautions was an established routine practice and had been in operation for many years. However, a researcher (CJL) attended all the joint education programme sessions, known locally as hip school, during the study period and the

THR preoperative assessment clinics during the study period to ensure that staff were providing the relevant regime. Hip champions assisted the researcher by attending preoperative clinics and postoperative orthopaedic wards during the study period. The assessment of fidelity of the treatment involved observing staff interactions with patients and in particular discussions about function, limitations, and equipment. Interactions between clinical staff and patients on the orthopaedic wards, at preoperative assessment clinics, and joint education programme sessions were documented. Hip champions assisted with the monitoring of the treatment fidelity throughout the study and the observations provided a basis for staff education and support in the implementation of the new regime. All protocol infringements were recorded but the emphasis of the monitoring was on giving immediate feedback to staff.

The proposed sample for the before and after study was 342 participants. This was calculated using an equivalence design, as the aim was to test whether the withdrawal of routine hip precautions had comparable effects in terms of patient outcomes with the established standard of care involving the prescription of hip precautions. The primary outcome was the Oxford Hip Score, which is the nationally accepted clinical instrument validated to measure disability pre- and post-surgery [24] and is routinely collected from patients following THR in the UK. As the Oxford Hip score has not been used in previous research of hip precautions, the minimum clinical important difference (MCID) is not known. Therefore, Cohen's generic MCID for clinical outcomes in the standard deviation unit (SD) was applied, i.e. any difference more than 50% of SD of the continuous measure in the study will be considered as clinically significant [25]. With a pre-defined margin for equivalence (i.e. .5 SD of the pooled SD of the two groups' scores), 128 participants (64 per group) would be required to be 80% sure that the limits of a two-sided 95% confidence interval will exclude a difference in means of more than .5 SD of the OHS. As this was not a RCT, the sample size was increased by approximately two times

the original size (256 participants: 128 per group) to help control for any potential confounding factors other than hip precautions, e.g. age, gender. The sample size was further increased to account for a 25% attrition rate (342 participants, 171 per group).

Data analysis

Statistical analyses were performed using SPSS (Version 24) or STATA 14. Equivalence analysis (primary analysis) was conducted to test for equivalence between the Oxford Hip Scores of the 'hip precautions' group and the 'no hip precautions' group at three months, using a Two One-Sided test (TOST) program package (17) in STATA 14. The specified range of the equivalence margin was set between - δ and + δ, where δ = .5 SD. Secondary analysis included comparison of all the other outcomes of the hip precautions group and the no hip precautions group. Between-group comparisons were conducted using Chi-square tests for categorical variables and Student's t-tests for continuous variables. The significance level was set at $P < .05$. Effect size was calculated as d: small = .2; medium = .5; large = .8. Missing data were not imputed. All analyses were performed according to 'intention-to-treat'.

Results

A total of 367 patients were enrolled in the study: 182 patients in phase 1, and 185 patients in phase 2. Of those patients, 237 successfully underwent THR surgery and were followed up (118 in phase 1 and 119 in phase 2). The washout phase lasted for six weeks. The flow of the participants is illustrated in Figure 1.

[INSERT FIGURE ONE HERE]

Table 1 outlines the demographic and surgical characteristics of the sample, which shows that the two groups did not differ statistically in the variables analysed. The primary indication for surgery was osteoarthritis in 97% of participants. Over 90% of participants were taking pain relief (91% in P1 and 94% in P2), with over half of those participants (54%) taking pain relief daily. More than half the participants (53%) were taking non-opioid analgesics, with a quarter (26%) taking nonsteroidal anti-inflammatory drugs.

[INSERT TABLE ONE HERE]

Prior to undergoing surgery, the two groups did not differ in terms of baseline data (Table 2), and had similar levels of perceived pain and function, ability to perform ADLs, sleep quality, mood, and health-related QoL.

[INSERT TABLE TWO HERE]

The equivalence analysis (TOST procedure) showed that the observed effect size (d = -.12) of the mean difference in the Oxford Hip Score (-.82, 95% confidence interval (CI): -2.64 to 1.00) of the two groups (hip precautions vs. no hip precautions) at three months post-surgery was significantly within the equivalent bound of Cohen's d: -.5 and .5, t (214) = 2.93, P = .002. (Figure 2).

[INSERT FIGURE TWO HERE]

No significant differences were observed between the two groups at six weeks and three months for the pain, function, ADLs, sleep, mood, and QoL (Table 3). However, a significant

difference was observed between the Oxford Hip Scores of the two groups at one week postoperatively surgery, t (219) = -3.901, $P < 0.001$ (mean difference = −3.61, 95% confidence interval = −5.43 to −1.78).

[INSERT TABLE THREE HERE]

At six weeks follow-up, participants in the hip precautions group (n = 113) reported similar levels of satisfaction to those in the no precautions group (n = 108), with regard to their surgery (n= 109, 96% vs. 105, 97%), rehabilitation program (n = 101, 89% vs. 96, 89%), and the information that they received (n = 107, 95% vs. 102, 94%). Three months postoperatively, the precautions group (n = 109) still had greater levels of satisfaction than the no hip precautions group (n = 103) with regard to their surgery (n = 106, 97% vs. 98, 95%), and the information provided (n = 105, 96% vs. 94, 91%). However, the no precautions group had greater levels of satisfaction with the rehabilitation program overall (n = 91, 88%) than the hip precautions group (n = 92, 84%). These differences were not statistically significant.

During the study, three dislocations occurred: two dislocations in the no precautions group (2/119, 1.7%) and one in the precautions group (1/118, 0.8%). Of the three participants who sustained a dislocation, two had had a posterior approach THR and the other an anterolateral approach THR. The participants were each under the care of a different surgeon. The dislocation in phase 1 occurred two weeks postoperatively, whilst the participant was travelling as a passenger in a car. One of the dislocations in phase 2 occurred three days postoperatively, following discharge home, while the patient was sitting on the sofa; the other dislocation occurred eight weeks postoperatively when the patient bent down to dry their feet. All patients initially underwent manipulation under anaesthesia and received a Derby brace (hip abduction

brace that prevents adduction and limits flexion of hip joint). Two participants experienced a second dislocation (one whilst lying in hospital bed following reduction, and the other six weeks later whilst bending down to reach something off the floor) and consequently underwent revision surgery.

Discussion

In this study, patients who were not prescribed hip precautions had a significantly greater Oxford Hip Score at one-week postoperatively. However, this difference was no longer observed at six weeks and three months (Oxford Hip Scores were equivalent). This could have been because patients who did not need to observe hip precautions had greater confidence in mobilising during the initial phase of their recovery. Patients also had similar outcomes for other measures: ability to perform daily activities, perceived QoL, sleep quality, and mood, suggesting that they recovered at a similar rate in the two groups.

The results of our current study reflect those reported by Ververeli et al. [7], who concluded that hip pain and function of patients who received precautions was 'equivalent' (although a formal equivalence analysis was not conducted by them) with those who did not. Interestingly, Mikkelsen et al. [8] reported that patients in their restricted (precautions) group had the fastest improvements in physical function and ADLs but this difference was eliminated by six weeks. By contrast we found the opposite result, with our no precautions group having the fastest improvements; our difference was also eliminated at six weeks postoperatively. Similar findings to Mikkelsen [8] were also reported by Dietz et al. [26], who observed a difference between groups at two weeks postoperatively, where the hip precautions group had improved HOOS Jr (Hip injury and Osteoarthritis Outcome joint replacement) scores. The authors concluded that the absence of hip precautions did not improve patients' outcomes which may

be explained by self-limiting behaviours of patients who did not receive hip precautions [26]. Peak et al. [6] noted that patients in their unrestricted (no precautions) group were able to perform a significantly greater number of ADLs compared to the patients in their restricted group (precautions) at six months postoperatively. The variation in findings may be a result of the type of precautions prescribed to patients in the different studies. In our study, patients who were prescribed precautions were advised to follow minimal precautions (e.g. no flexion beyond 90 degrees, no adduction, and no rotation) and patients in the no precautions group were not restricted by specific movements. By comparison, in other studies (e.g. Peak et. [6]) minimal precautions were still prescribed to patients in the unrestricted group, and those in the restricted group received significantly more precautions (including supine sleeping with abduction pillow, no driving or being a car passenger).

There has been increased interest in the debate around the use of hip precautions since our study started. However, hip precautions are still widely prescribed. A national survey from the Netherlands found that precautions were recommended to between 69% and 100% of patients following THR [27]. A North American survey reported that two-thirds of surgeons continue to apply precautions in some manner, and almost half of these universally prescribe precautions [28]. The surgical approach, surgeon experience and head size were significantly associated with whether patients were prescribed hip precautions and equipment [28]. In Nordic countries, a recent survey has highlighted there are discrepancies between countries (Denmark, Finland, Norway and Sweden), with 81% of in Norway prescribing precautions whilst 50% of hospitals in Denmark prescribe precautions [29]; the number of hospitals prescribing precautions in Sweden (62%) and Finland (59%) were similar. Whilst some countries are becoming more liberal about the use of hip precautions, there remains continued widespread use of them. The

significantly elevated rates of precaution use and use of increased head size in prosthesis suggests that surgeons remain unconvinced with results from recent studies [28].

Strengths and limitations

This study used a before and after design and it is recognised that there are limitations with this methodology. A large multicentred randomised control trial would be required to draw definitive conclusions. However, whilst it would have been preferable to use a randomised controlled trial (RCT) design, this was not possible because of potential contamination issues discussed previously [23]. We explored the possibility of using a cluster RCT design, however the hospitals approached had fixed views on which intervention they wanted to deliver, so this was not feasible. However, given that we used a single site, the use of equivalence analysis performed on the primary outcome was a strength as previous studies have not used this analysis to compare outcomes following THR surgery. We were also fortunate that our groups were well balanced at baseline. The focus on patient outcomes rather than dislocation was also a key aim and strength of our study. Whilst dislocation is a significant complication, the goal of THR surgery is to decrease pain and improve function. Therefore, assessing outcomes which focus on the perceived health of the patients, rather than adverse events and complications associated with surgery, is important.

The study used self-reported measures which can be subjected to bias. Whilst the limitations of not using objective measures have been recognised, it was not possible to collect objective measures within the resources of this study.

It is possible that hip precautions were not completely eradicated during phase 2 of the study as participants could have accessed online materials or spoken to others who had previously observed precautions. However, the introduction of hip champions to ensure that clinicians

were adhering to the new regime worked well and the washout period allowed staff the opportunity to refine the new intervention. Although patient compliance with hip precautions was not evaluated in our before and after study, it has been explored in-depth with patient participants in a nested interview study [30].

Conclusion

Our study provides support for clinicians considering changing their clinical practice regarding the use of hip precautions. The results demonstrate that hip precautions provided no additional benefits to patients following THR surgery in terms of function, and that patients recovered at a similar rate regardless of whether they received precautions or not. However, although some hospitals have relaxed their practice and use of hip precautions sine this study began, many hospitals still continue to prescribe precautions routinely. The findings of our study will make a significant contribution to the debate around hip precautions and help determine their value in routine clinical practice. Whether and how these findings will change practice nationally, or why not, are topics for further investigation.

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Tables

Table 1. Participant demographic, medical and surgical details

	Hip precautions (n = 118)	**No hip precautions (n = 119)**
Age (years)	67.0 (±11.2)	68.2 (±10.1)
Sex (*n* female) (%)	73 (62)	85 (71)
BMI (kg/m2)	29.1 (±5.34)	29.1 (±8.85)
Surgical approach, *n (%)*		
Posterior	82 (69)	82 (69)
Anterolateral	36 (31)	37 (31)
Side of THR surgery, *n (%)*		
Left	45 (38)	51 (43)
Right	73 (62)	68 (57)

Data presented as mean (±SD), unless otherwise stated. BMI: Body Mass Index; THR: Total Hip Replacement.

Table 2. Participant baseline measures

Measure	Hip precautions (n = 118)	No hip precautions (n = 119)	Mean difference (95% CI)	*P*-value	Effect size (d)
OHS	19.31 (±8.52)	20.33 (±7.47)	-1.01 (-3.07, 1.04)	.331	-.13
NEADL	18.15 (±3.82)	18.22 (±3.79)	-.07 (-1.04, .91)	.894	-.02
PSQI	9.25 (±4.05)	9.95 (±4.13)	-.70 (-1.74, .35)	.192	-.17
HADS					
- **Anxiety**	6.01 (±4.04)	5.99 (±4.01)	.02 (-1.01, 1.05)	.974	<0.01
- **Depression**	5.70 (±3.68)	5.75 (±3.82)	-.04 (-1.01, .92)	.927	-.01
EQ-5D					
- **Index**	.43 (±.24)	.47 (±.21)	-.03 (-.09, .02)	.235	-.18
- **VAS (%)**	63.1 (±19.3)	63.8 (±19.2)	-.72 (-5.65, 4.21)	.774	-.04

Data presented as mean (±SD), unless otherwise stated. Higher scores indicate better outcomes for the Oxford Hip Score (OHS), Nottingham Extended Activities of Daily Living (NEADL) and quality of life (EQ-5D), with higher scores signifying poorer outcomes for Pittsburgh Sleep Quality Index (PSQI) and Hospital Anxiety and Depression Scale (HADS).
Effect size (standardised mean difference): Cohen's d

Table 3. Participant outcome measures at six weeks and three months post-surgery

6 weeks measures	**Hip precautions (n = 118)**	**No hip precautions (n = 119)**	**Mean difference (95% CI)**	***P*-value**	**Effect size (d)**
OHS	35.14 (±7.08)	33.99 (±7.40)	1.11 (-.77, 3.07)	.239	.16
NEADL	17.26 (±4.23)	17.06 (±3.79)	.20 (-.87, 1.27)	.711	.05
PSQI	8.00 (±4.58)	7.98 (±4.18)	.02 (-1.15, 1.18)	.975	<.01
HADS					
- **Anxiety**	3.82 (±3.79)	3.81 (±3.71)	.02 (-.98, 1.01)	.972	<.01
- **Depression**	3.46 (±3.43)	3.60 (±3.42)	-.14 (-1.05, .77)	.759	-.04
EQ-5D					
- **Index**	.71 (±.17)	.70 (±.17)	.01 (-.04, .05)	.800	.06
- **VAS (%)**	63.1 (±19.3)	63.8 (±19.2)	-.72 (-5.65, 4.21)	.774	-.04
3 months measures	**Hip precautions (n = 118)**	**No hip precautions (n = 119)**	**Mean difference (95% CI)**	***P*-value**	**Effect size (d)**
OHS	40.31 (±7.03)	41.14 (±6.46)	-.83 (-2.64, .98)	.368	-.13
NEADL	20.11 (±2.58)	19.84 (±3.04)	.28 (-.49, 1.04)	.477	.10
PSQI	6.12 (±4.27)	6.35 (±4.33)	-.23 (-1.40, .93)	.697	-.05
HADS					
- **Anxiety**	3.13 (±3.58)	3.19 (±3.45)	-.06 (-1.02, .89)	.894	-.02
- **Depression**	2.71 (±3.34)	2.58 (±2.95)	.13 (-.73, .99)	.764	.04
EQ-5D					
- **Index**	.78 (±.17)	.79 (±.18)	-.01 (-.05, .04)	.835	-.06
- **VAS (%)**	81.52 (±13.59)	79.29 (±15.82)	-.72 (-5.65, 4.21)	.269	.15

Data presented as mean (±SD), unless otherwise stated. Higher scores indicate better outcomes for the Oxford Hip Score (OHS), Nottingham Extended Activities of Daily Living (NEADL) and quality of life (EQ-5D), with higher scores signifying poorer outcomes for Pittsburgh Sleep Quality Index (PSQI) and Hospital Anxiety and Depression Scale (HADS). * 107 OHS at three months for no hip precautions group.
Effect size (standardised mean difference): Cohen's d

Figures