Statistical Analysis Plan (Short)

Effects of a consumer-focused Massive Open Online Course on consumer knowledge about osteoarthritis management and pain self-efficacy: a randomised controlled trial

Version: 1

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Date of SAP: 18/12/2023

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Date of template: 25/10/2021

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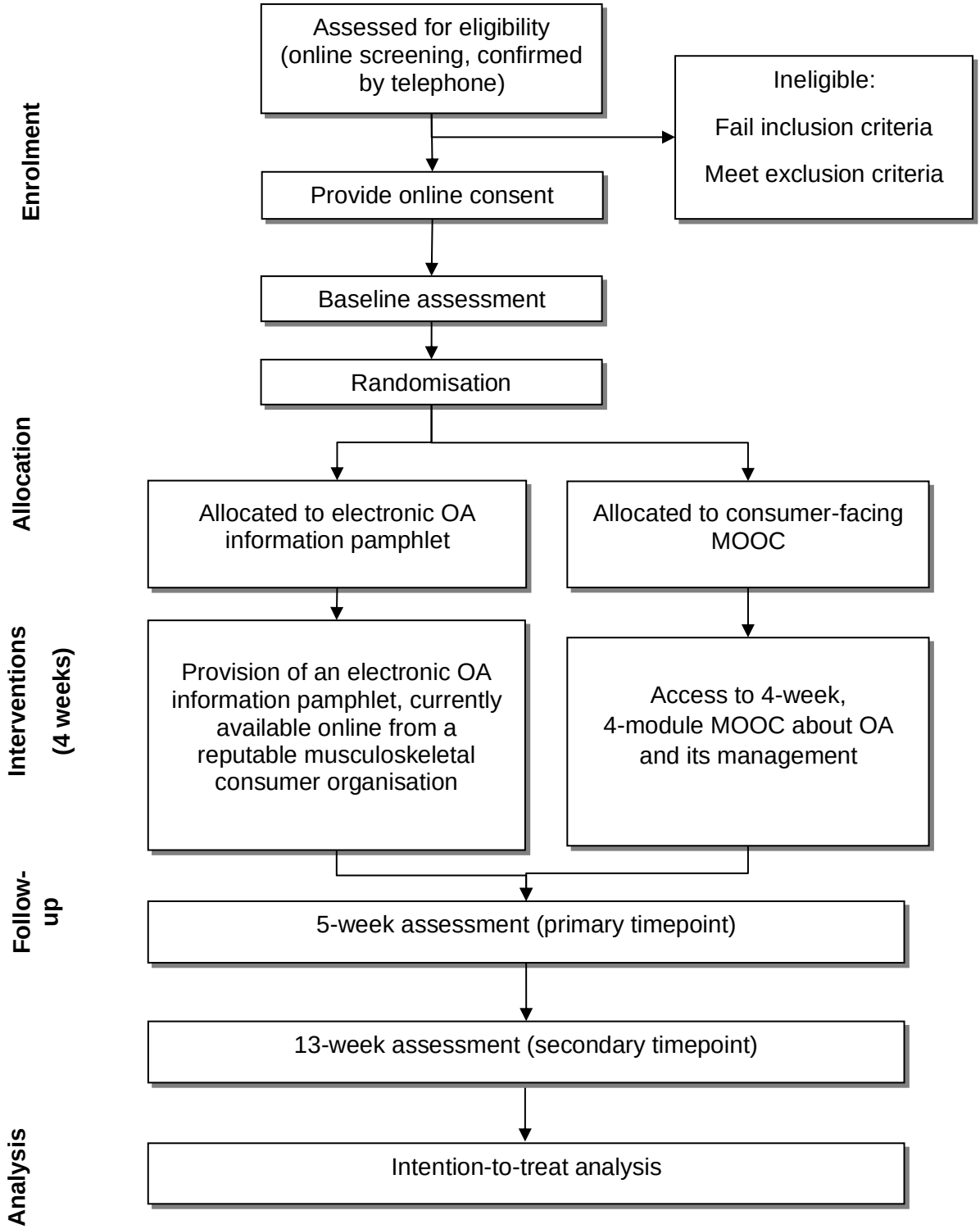
1 Introduction

Objectives	To evaluate the effects of a consumer-focused MOOC on knowledge about osteoarthritis and its management and pain self-efficacy for people with hip and/or knee OA.
Study Design	Two arm randomised controlled trial
Planned Sample Size	A sample size of 60 participants per arm (120 in total) is required for 90% power to demonstrate that the consumer-facing MOOC is superior to the control with a two-sided 2.5% significance level (accounting for multiple comparisons across the two primary outcomes by using Bonferroni correction) and allowing for a 20% dropout rate. The sample size calculation was based on the following assumptions: a standardised between-group effect size of 0.625 for pain self-efficacy (based on our prior research[5], corresponding to an absolute between-group difference in mean change from baseline to 5 weeks of 1 unit in ASES pain subscale score favouring the MOOC, with within-group standard deviation (SD) of 1.6 units,[5] correlation between measures across all three timepoints of 0.5 (i.e., compound symmetry variance-covariance matrix)[5], and using a constrained longitudinal data analysis (cLDA) model.[9] With this sample size, we also have at least 90% power to detect a between-group effect size of 0.8 for OA knowledge (conservative for this type of program[6]), corresponding to an absolute between-group difference in mean change from baseline to 5 weeks of 4.6 units in KOAKS/HOAKS score favouring the MOOC, with within-group SD of 5.8 units,[5] and correlation between measures across all three timepoints of 0.2.[5]
Study Procedures	Following enrolment and baseline assessment, participants in the experimental group will be asked to complete a consumer-facing MOOC about osteoarthritis and its management over a 5-week period. Participants in the control group will receive an online information pamphlet about osteoarthritis that is currently available from a reputable musculoskeletal consumer organisation. At 5 weeks (primary timepoint) and 13 weeks (secondary timepoint) post randomisation, participants in both groups will complete outcome measures.
Duration of the study	Each participant will be involved for 13 weeks.

Figure 1. Flow diagram of trial procedures



2 Data Source

All outcomes are participant reported. All data collection will be using REDCap™ (Research Electronic Data Capture) hosted at the University of Melbourne[7; 8].

Re-identifiable/coded data

Questionnaires will be collected electronically, and will contain only participant study codes, and no identifying information. Electronic copies will be stored in REDCap™, accessible only to the researchers by password protection. Data from within REDCap™ will be exported to Microsoft Excel and other statistical packages used by the researchers for analyses and stored securely on password-protected servers. MOOC generated data (FutureLearn data) will be generated during participant interaction with the online course. This data will be stored on a secure password protected FutureLearn platform/server which will be accessible to members of the research team with data permissions. Interaction data will not contain names/emails and will only contain a user code number. Interaction data collected within the course will include course access, click rates, page views and interactions with discussions, polls and quizzes. Although collected, this data is not being analysed in this trial.

3 Analysis Objectives

To evaluate the effects of a consumer-focused MOOC on knowledge about osteoarthritis and its management and pain self-efficacy for people with hip and/or knee OA.

3.1 Aim 1

The primary aim of this study is to determine whether a consumer-focused MOOC for people with a clinical diagnosis of hip/knee OA can improve their i) knowledge and beliefs about management of the condition, measured using the Knee/Hip Osteoarthritis Knowledge Scale (KOAKS/HOAKS) or ii) self-efficacy for pain, measured using the Arthritis Self-Efficacy Scale (ASES), pain subscale, at 5 weeks post randomisation, compared to currently available OA information.

The primary hypothesis is that participants allocated to the group receiving the MOOC will have greater improvements in OA knowledge and/or self-efficacy for pain at 5 weeks compared to those allocated to the control.

3.2 Aim 2

The secondary aims will determine whether a consumer-focused MOOC is superior with regards to i) fear of movement, exercise self-efficacy, illness perceptions, at 5- and 13-weeks post randomisation,
ii) treatment intentions and care seeking intentions at 5-weeks post randomisation, and
iii) physical activity levels, key behaviours (physical activity/exercise and weight loss), pain medication usage, current care seeking behaviour, knowledge and beliefs about management of the condition, and self-efficacy for pain at 13-weeks post randomisation, compared to the control.

3.3 Aim 3

Describe engagement with, and perceived usefulness of, each course module and overall satisfaction with the course.

4 Analysis sets/Populations/Subgroups

Inclusion Criteria

Participants will be eligible for the study if they meet the following inclusion criteria:

- live in Australia;
- have an unreplaced (native) hip or knee joint that meets the National Institute for Health and Care Excellence clinical criteria for OA[11] :
    - aged 45 years or over;
    - activity-related pain at the joint;
    - joint morning stiffness that lasts ≤ 30 mins or no morning stiffness at the joint
- history of pain for ≥ 3mths at the joint; and
- joint pain on most days of the past month;
- have access to a computer with internet connection and an email address; and
- able to give informed consent and willing to commit to all study evaluation and assessment procedures.

Exclusion Criteria

Participants will be ineligible for the study if they:

- have self-reported systemic arthritis (e.g. rheumatoid arthritis, gout);
- are scheduled for lower limb joint surgery in the next 13 weeks;
- have completed an online educational course about OA that involved at least 2 hours of learning in total in the past 12 months; and/or
- are unable to easily read and understand English.

5 Endpoints and Covariates

All variables are listed in Appendix 1 and the coding of the derived variables can be found in Appendix 2. Outcome measures are also provided in the table below. Follow-up time-point is relative to randomisation.

Name	Description	Scale	Time-points measured
Primary Outcome			
Change (follow up minus baseline) in Knee/Hip Osteoarthritis Knowledge Scale (KOAKS/HOAKS)[3]	Scored using 11 statements regarding - osteoarthritis disease knowledge - principles of management - treatment approaches of exercise, physical activity, weight loss, surgery.	Each statement rated using a 5-point Likert scale (False (1), Possibly False (2), Unsure (3), Possibly True (4), or True (5)) Items 1,2, 3, 4, 7, and 11 scored in reverse. All item scores are added for a total score range of 11 to 55. Higher scores indicate more accurate knowledge about osteoarthritis.	Baseline, 5 and 13 weeks
Change (follow up minus baseline) in Arthritis Self-Efficacy Scale (Pain subscale)[10]	Scored from 5 questions relating to the level of certainty that one can function despite pain.	Each statement rated using a 10-point Numerical Rating Scale (NRS) where 1=Very uncertain and 10=Very certain. Scores are the mean of all the items in the subscale (range 1-10). Higher scores indicate greater self-efficacy.	Baseline, 5 and 13 weeks
Secondary Outcomes			
Change (follow up minus baseline) in Brief fear of movement for OA scale[14]	Scored from 6 statements regarding fear of injury/re-injury due to movement.	Each statement rated using a 4-point Likert scale from 1=Strongly disagree to 4=Strongly agree. All item scores are added for a total score range of 6 (minimal fear) to 24 (maximal fear). Higher change scores indicate greater fear.	Baseline, 5 and 13 weeks
Change (follow up minus baseline) in Self-efficacy for Exercise Scale[12]	Scored using a nine-item scale that assesses self-efficacy expectations about ability to continue exercising in the face of perceived barriers.	Items are scored on an 11-point NRS from “not confident” to “very confident”. Total scores range from 0 to 90, higher scores indicating higher self-efficacy.	Baseline, 5 and 13 weeks
Change (follow up minus baseline) in Brief Illness Perceptions Questionnaire (B-IPQ)[1]	Scored from eight items that assess dimensions of: Identity, Timeline,	Each item is scored on a Likert scale from 0 to 10. An overall score will be computed which	Baseline, 5 and 13 weeks

	Consequences, and Cure-Control. We will not capture item 9 of the B-IPQ which is an open-ended question related to causes of illness. For each item, 'Illness' will be replaced with 'osteoarthritis'.	represents the degree to which the illness is perceived as threatening or benign. To compute the score, score items 3, 4, and 7 will be reversed and added to items 1, 2, 5, 6, and 8. Higher scores represent a more threatening view of the illness.	
Management intentions for physical activity/exercise, time spent being sedentary, weight loss and joint replacement surgery	Four bespoke statements regarding intentions for physical activity/exercise, time spent being sedentary, weight loss and joint replacement surgery. 1. Over the next **2 MONTHS**, I intend to increase my amount and/or intensity of physical activity and/or exercise. 2. Over the next **2 MONTHS**, I intend to reduce the amount of time I spend sedentary (e.g. sitting or lying down). 3. Over the next **2 MONTHS**, I intend to make efforts to lose weight. 4. Over the next **2 YEARS**, I intend to have hip/knee joint replacement surgery (to replace the affected joint with an artificial joint).	Each statement rated as Yes/No. Reported as number/proportion of each response.	5 weeks
Intention to seek care from a health professional	Four bespoke statements regarding care seeking intentions: Over the next **2 MONTHS**, I intend to see a health professional to discuss a. weight loss b. an exercise/physical activity program c. pain relieving medication d. joint replacement surgery	Response options Yes/No. Reported as number and proportion responding Yes/No.	5 weeks

Change (follow up minus baseline) in current physical activity/exercise behaviour captured via the Incidental and Planned Exercise Questionnaire, version W (IPEQ-W) [4]	The IPEQ-W will capture physical activity / exercise behaviour during the past week via two levels of physical activity, i.e., planned activities that focus on planned exercise and planned walks (Q1–Q6) and incidental activities that focus on more casual day-to-day activities (Q7–Q10)	Reported on a scale of 0–128; higher scores indicate higher levels of activity.	Baseline and 13 weeks
Current exercise/physical activity behaviour	Bespoke question: Over the past 2 weeks, how would you compare your amount of physical activity/exercise to when you started the study?	Response options on a 3 point-Likert with options Less Same More Dichotomised into 'more' and 'not more' = (less and same)	13 weeks
Current weight loss behaviour	Bespoke question: In the past **2 WEEKS**, did you make any effort to lose weight (e.g. diet changes)?	Response options Yes/No, reported as number and proportion per category.	13 weeks
Current care seeking behaviour	Four bespoke questions: Since you enrolled in this study, have you consulted a health professional to discuss: a. weight loss? b. an exercise/physical activity program? c. pain relieving medication d. joint replacement surgery?	Response options Yes/No. Reported as number and proportion responding Yes/No.	13 weeks
Oral pain medication usage	Participants will self-report the use of common oral pain-relieving medications taken at least once a week in the prior month for knee/hip pain by selecting Yes/No from options: i. oral non-steroidal anti-inflammatory drugs ii. analgesics (paracetamol combinations), iii. oral corticosteroids and iv. oral opioids	Number and proportion of participants using any oral pain medication for hip/knee pain at least once a week in the prior month will be reported.	Baseline and 13 weeks

6 Handling of Missing Values and Other Data Conventions

If missing data are present, an appendix table will provide summaries of baseline characteristics and baseline levels of primary and secondary outcomes where measured between two groups: those participants who provide both primary outcomes post-intervention at the primary timepoint of 5-weeks, and those participants who are missing either or both primary outcomes at 5-weeks. For primary and secondary outcomes analysed using Constrained longitudinal data analysis (cLDA)[9] models, these models use all available cases and provide valid inference in the presence of missing data if the data are missing at random (MAR). If missingness in these outcomes is >5%, analyses will be conducted using the delta-adjustment method under the pattern-mixture modelling framework in the context of multiple imputation to assess sensitivity to missingness not at random (MNAR) with a range of plausible delta parameters. For all other outcomes, if missingness <5%, analyses will be performed on complete case data only. If missingess >5% for these other outcomes, the primary analyses of these outcomes will be based on multiply imputed data assuming data MAR. Sensitivity analyses will be conducted for these outcomes using 1) complete case data and 2) multiply imputed data using the delta-adjustment method under the pattern-mixture modelling framework, assuming data MNAR. Missing outcomes will be imputed using chained equations with predictive mean matching and five nearest neighbours for continuous outcomes. Imputation models for outcomes will include all primary and secondary outcomes at both baseline and post-intervention timepoints where relevant, along with study joint, body mass index, age, sex, gender, ethnicity, duration of symptoms, geographical location, education level, current employment status, financial situation, comorbidities, confidence using technology in day-to-day life, perceived OA knowledge, the Health Literacy Questionnaire (HLQ) domains, current OA management strategies, past care seeking and current care seeking. Data will be imputed for each treatment group separately. The number of imputed data sets created will be based on the percentage of participants in the sample with missing outcome data (e.g., 15 imputed datasets if 15% of participants have missing data). Estimates from the imputed datasets will be combined using Rubin's rules.[2]

7 Statistical Methodology

7.1 Statistical Procedures

Analysis will be conducted by a biostatistician (FM, supervised by ADS) blinded to treatment group name, with two-sided hypothesis tests. Analyses will include all participants according to their group allocation (intention-to-treat). All analysis models will be adjusted for the stratification factor, eligible joint (hip/knee). Standard diagnostic plots will be used to check model assumptions.

7.1.1 Aim 1

Each primary outcome will be analysed using a cLDA[9] model. The response will consist of all KOAKS/HOAKS or ASES pain scores (at baseline, 5 and 13 weeks), and the model will include factors for group, time (categorical), and group-by-time interaction, with the restriction of a common baseline mean across treatment groups. The mean change in KOAKS/HOAKS or ASES pain scores from baseline to each follow-up timepoint between the groups will be obtained. The primary hypothesis will be evaluated by obtaining the estimated differences between groups in mean change in KOAKS/HOAKS and ASES pain score from baseline to 5 weeks post randomisation, and multiplicity adjusted two-sided 95% confidence intervals (CI) and p-values.

7.1.2 Aim 2

Secondary outcomes: Management intentions and care seeking intentions at 5 weeks, and care seeking behaviour, exercise and weight loss behaviours and pain medication usage (adjusted for baseline usage) at 13 weeks will be analysed using log-binomial regression models, with results reported as risk ratios with 95% CIs and p-values unadjusted for multiplicity.

Change in physical activity levels (13 weeks minus baseline) will be analysed using a linear regression model adjusted for baseline physical activity, with results reported as mean differences in change (13 weeks minus baseline) with 95% CIs and p-values unadjusted for multiplicity. Other continuous secondary outcomes with multiple follow-up timepoints (kinesiophobia, exercise self-efficacy, perceptions of osteoarthritis illness) will be analysed the same as the primary outcomes, with results reported as mean differences in change from baseline with 95% CIs and p-values unadjusted for multiplicity.

7.1.3 Aim 3

Process measures, baseline characteristics and clinical measures will be summarised as appropriate (means and standard deviations for continuous variables that appear to be distributed approximately symmetrically, medians and interquartile ranges for other continuous variables, counts and percentages for categorical variables) by intervention group and presented in tables. Tests of statistical significance will not be undertaken to compare baseline characteristics of intervention groups; rather, the clinical importance of any imbalance will be noted.

7.2 Measures to Adjust for Multiplicity, Confounders, Heterogeneity

We have two primary outcomes so have adjusted the alpha for each primary outcome at the primary timepoint to 0.025 (accounting for Bonferroni correction for two comparisons) to give an overall alpha of 0.05 across all comparisons. We have several secondary outcomes. All secondary outcomes are exploratory and not powered for. We will therefore not adjust for multiple secondary outcomes but instead report all effect sizes, confidence intervals, and p values in order to let readers use their own judgment about the relative weight of the conclusions. This approach aligns with the usage of p-values favoured by the American Statistical Association.[15]

8 Sensitivity Analyses

An analysis will be conducted using the delta-adjustment method under the pattern-mixture modelling framework in the context of multiple imputation to assess sensitivity to missingness not at random for any outcomes where >5% of outcome data is missing. If multiply imputed data is used for the main analysis for any secondary outcomes not analysed using a cLDA model, sensitivity analyses will be conducted on complete cases as well.

9 QC Plans

Data quality will be checked/promoted through a process of identifying extreme values and checking the source of these values in case of a data entry error. A record of any/all manual corrections to data will be maintained. Calculations of scores from multi-item scales will be carried out using a statistical package (StataCorp. 2020. Stata Statistical Software: Release 16.1. College Station, TX: StataCorp LLC) and cross-checked using Microsoft Excel functions to reduce errors.

10 Programming Plans

A list of all tables, figures, listings and their templates can be found in Appendix 3.

11 References

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Development of the Hip and Knee Osteoarthritis Knowledge Scales and protocol for testing their measurement properties. Osteoarthritis and Cartilage Open 2021;3(2):100160.
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[10] Lorig K, Chastain RL, Ung E, Shoor S, Holman HR. Development and evaluation of a scale to measure perceived self-efficacy in people with arthritis. Arthritis Rheum 1989;32(1):37-44.
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[12] Resnick B, Jenkins LS. Testing the reliability and validity of the Self-Efficacy for Exercise scale. Nursing research 2000;49(3):154-159.
[13] Sangha O, Stucki G, Liang MH, Fossel AH, Katz JN. The Self-Administered Comorbidity Questionnaire: a new method to assess comorbidity for clinical and health services research. Arthritis Rheum 2003;49(2):156-163.
[14] Shelby RA, Somers TJ, Keefe FJ, DeVellis BM, Patterson C, Renner JB, Jordan JM. Brief Fear of Movement Scale for osteoarthritis. Arthritis Care Res (Hoboken) 2012;64(6):862-871.
[15] Wasserstein R, Schirm A, Lazar N. Moving to a world beyond “p< 0.05”: Taylor & Francis, 2019.

Appendix 1

VARIABLES IN THE DATA SET

Name	Description	Scale	Variable label in spreadsheet	Range	Better
Primary Outcome					
Knee/Hip Osteoarthritis Knowledge Scale (KOAKS/HOAKS)[3]	Scored using 11 statements regarding - osteoarthritis disease knowledge - principles of management - treatment approaches of exercise, physical activity, weight loss, surgery. Baseline, 5 and 13 weeks	Each statement rated using a 5-point Likert scale (False (1), Possibly False (2), Unsure (3), Possibly True (4), or True (5)) Items 1,2, 3, 4, 7, and 11 scored in reverse. All item scores are added for a total score range of 11 to 55. Higher scores indicate more accurate knowledge about osteoarthritis.	Baseline item 1: hkoaks1_0w Baseline item 2: hkoaks2_0w Etc 5 weeks item 1: hkoaks1_5w 13 weeks item 1: hkoaks1_13w	Each of 11 items: 1-5 range; If REDCap can derive total scores, range 11-55.	↑
Arthritis Self-Efficacy Scale (Pain subscale)[10]	Scored from 5 questions relating to the level of certainty that one can function despite pain. Baseline, 5 and 13 weeks	Each statement rated using an 10-point Numerical Rating Scale (NRS) where 1=Very uncertain and 10=Very certain. Scores are the mean of all the items in the subscale (range 1-10). Higher scores indicate greater self-efficacy.	ases_p1_0w to ases_p5_0w	Each item and mean score range 1-10	↑

Name	Description	Scale	Variable label in spreadsheet	Range	Better
Secondary Outcomes					
Brief fear of movement for OA scale[14] (kinesiophobia)	Scored from 6 statements regarding fear of injury/re-injury due to movement. Baseline, 5 and 13 weeks	Each statement rated using a 4-point Likert scale from 1=Strongly disagree to 4=Strongly agree. All item	bfoms1_0w to bfoms6_0w	Each statement 1-4; total 6-24.	↓

		scores are added for a total score range of 6 (minimal fear) to 24 (maximal fear).			
Self-efficacy for Exercise Scale[12]	Scored using a nine-item scale that assesses self-efficacy expectations about ability to continue exercising in the face of perceived barriers. Baseline, 5 and 13 weeks	Items are scored on an 11-point NRS from "not confident" to "very confident". Total scores range from 0 to 90, higher scores indicating higher self-efficacy.	see1_0w to see9_0w	Each item 0-10; total 0-90.	↑
Brief Illness Perceptions Questionnaire (B-IPQ)[1]	Scored from eight items that assess dimensions of: Identity, Timeline, Consequences, and Cure-Control. We will not capture item 9 of the B-IPQ which is an open-ended question related to causes of illness. For each item, 'Illness' will be replaced with 'osteoarthritis'. Baseline, 5 and 13 weeks	Each item is scored on a Likert scale from 0 to 10. An overall score will be computed which represents the degree to which the illness is perceived as threatening or benign. To compute the score, score items 3, 4, and 7 will be reversed and added to items 1, 2, 5, 6, and 8. Higher scores represent a more threatening view of the illness.	bipq1_0w to bipq8_0w	Each item 0-10; overall score 0-80	↓
Management intentions for physical activity/exercise, time spent being sedentary, weight loss and joint replacement surgery	Four bespoke statements at 5 weeks only regarding intentions for physical activity/exercise, time spent being sedentary, weight loss and joint replacement surgery. 1. Over the next **2 MONTHS**, I intend to increase my amount and/or intensity of physical activity and/or exercise.	Each statement rated as Yes/No. Reported as number/proportion of each response.	rx_intentions1_5w rx_intentions1b_5w rx_intentions2_5w rx_intentions2b_5w rx_intentions3_5w rx_intentions3b_5w rx_intentions4_5w	N/A	N/A

	2. Over the next **2 MONTHS**, I intend to reduce the amount of time I spend sedentary (e.g. sitting or lying down). 3. Over the next **2 MONTHS**, I intend to make efforts to lose weight. 4. Over the next **2 YEARS**, I intend to have hip/knee joint replacement surgery (to replace the affected joint with an artificial joint). For items 1-3, if yes is selected, participant is asked: "What do you intend to do?" (response captured in an open text field).				
Intention to seek care from a health professional	Four bespoke statements at 5 weeks only regarding care seeking intentions: Over the next **2 MONTHS**, I intend to see a health professional to discuss a. weight loss	Response options Yes/No. Reported as number and proportion responding Yes/No. Health professional categories reported as number and proportion per category in an appendix.	seek_care1_5w seek_care1b seek_other1 seek_care2_5w seek_care2b care_other2 seek_care3_5w seek_care3b_5w seek_care3c_5w_other seek_care4_5w seek_care4b_5w	N/A	N/A

	b. an exercise/physical activity program c. pain relieving medication d. joint replacement surgery For each item, if yes is selected, participant is asked: "What type of health professional do you intend to see?" (select all that apply) 1. General practitioner 2. Physiotherapist 3. Exercise physiologist 4. Dietician 5. Psychologist 6. Pharmacist 7. Podiatrist 8. Occupational therapist 9. Rheumatologist 10. Sports and exercise physician 11. Orthopaedic surgeon 12. Other (specify)		seek_care4c_5w_other		
Incidental and Planned Exercise Questionnaire, version W (IPEQ-W) [4]	The IPEQ-W will capture physical activity / exercise behaviour during the past week via two levels of	Reported on a scale of 0–128 derived from https://neura.edu.au/resources/content/IPEQ_W.pdf; higher	ex_class_0w ex_class_length_0w home_ex_0w home_ex_length_0w	0–128	↑

	physical activity, i.e., planned activities that focus on planned exercise and planned walks (Q1–Q6) and incidental activities that focus on more casual day-to-day activities (Q7–Q10) at baseline and 13 weeks.	scores indicate higher levels of total activity.	other_exyn_0w other_ex_number_0w ipeq_other1_0w other_ex1_number_0w other2_length_0w ipeq_other2_0w other_ex2_number_0w other2_length2_0w ipeq_other3_0w other_ex3_number_0w other2_length3_0w ipeq_other4_0w other_ex4_number_0w other2_length4_0w ipeq2_0w ipeq3_0w ipeq4_0w ipeq5_0w ipeq6_0w ipeq7_0w		
Current exercise/physical activity behaviour	Bespoke question at 13 weeks: Over the past 2 weeks, how would you compare your amount of physical activity/exercise to when you started the study?	Response options on a 3 point-Likert with options Less Same More Dichotomised into 'more' and 'not more' = (less and same): see 'derived variables' section below for details.	current_ex_13w	N/A	N/A
Current weight loss behaviour	Bespoke question at 13 weeks: In the past **2 WEEKS**, did you make any effort to lose weight (e.g. diet changes)?	Response options Yes/No, reported as number and proportion per category.	current_wl_13w	N/A	N/A

Current care seeking behaviour	Four bespoke questions at 13 weeks: Since you enrolled in this study, have you consulted a health professional to discuss: a. weight loss? b. an exercise/physical activity program? c. pain relieving medication d. joint replacement surgery? For each question yes is selected participant is asked: "What type of health professional did you see?" (select all that apply) 1. General practitioner 2. Physiotherapist 3. Exercise physiologist 4. Dietician 5. Psychologist 6. Pharmacist 7. Podiatrist 8. Occupational therapist 9. Rheumatologist 10. Sports and exercise physician 11. Orthopaedic surgeon Other (specify)	Response options Yes/No. Reported as number and proportion per category. Health professional categories reported as number and proportion per category.	care_seek1_13w care_seek1b_13w care_seek1c_13_week_other care_seek2_13w care_seek2b_13w care_seek2c_13_week_other care_seek3_13w care_seek3b_13w care_seek3c_13_week_other care_seek4_13w care_seek4b_13w care_seek4c_13_week_other	N/A	N/A

Oral pain medication usage	At baseline and 13 weeks, participants will self-report the use of common oral pain-relieving medications taken at least once a week in the prior month for knee/hip pain by selecting Yes/No from options: i. oral non-steroidal anti-inflammatory drugs ii. analgesics (paracetamol combinations), iii. oral corticosteroids and iv. oral opioids	Response options Yes/No. Number and proportion of participants using any oral pain medication for hip/knee pain at least once a week in the prior month will be reported.	anti_inflam_tablets_0w analgesia_paracet_0w oral_corticosteroids_0w oral_opioids_0w	N/A	N/A

Clinical Measures					
Name	**Description**	**Scale**	**Variable label in spreadsheet**	**Range**	**Better**
Physical function	Scored using the 17 questions of the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) physical function subscale. Baseline and 13 weeks	Rated using a 5-point Likert scale with response options ranging from no dysfunction (0) to extreme dysfunction (4). Ranges from 0 (no dysfunction) to 68 (maximum dysfunction).	womaca1_0w womaca4_0w womaca7_0w womaca10_0w womaca13_0w womaca16_0w womaca2_0w womaca5_0w womaca8_0w womaca11_0w womaca14_0w womaca17_0w womaca3_0w womaca6_0w womaca9_0w womaca12_0w womaca15_0w	Each question 0-4; total 0-68 (sum of 17 questions).	Lower

			womaca1_13w womaca2_13w womaca3_13w womaca4_13w womaca5_13w womaca6_13w womaca7_13w womaca8_13w womaca9_13w womaca10_13w womaca11_13w womaca12_13w womaca13_13w womaca14_13w womaca15_13w womaca16_13w womaca17_13w		
Severity of knee/hip pain during walking	Self-reported average pain on walking in the last week. Baseline and 13 weeks	Scored on an 11-point NRS with terminal descriptors of 0=no pain and 10=worst pain possible.	nrs_walking_0w nrs_walking_13w	0-10	Lower
Weight	Self-reported Baseline and 13 weeks	Measured in kilograms	baseline_weight w13_weight	NA	NA

Process measures					
Name	**Description**	**Scale**	**Timepoint**	**Variable label in spreadsheet**	**Range/Better**
MOOC program completion	Four bespoke questions: 1. Did you complete module/week one, "Learning about osteoarthritis"?	Response options Yes/No. Reported as number and proportion per category	5 weeks (experimental group only)	mooc_module1_5w mooc_module2_5w mooc_module3_5w mooc_module4_5w	NA

	2. Did you complete module/week two "Physical activity and exercise for osteoarthritis"? 3. Did you complete module/week three "Body weight and osteoarthritis"? 4. Did you complete module/week four "Additional management strategies and making a plan"?				
Perceived usefulness of MOOC modules for OA self-management	Participants will answer 5 bespoke questions: 1. How useful did you find module/week one, "Learning about osteoarthritis"? 2. How useful did you find module/week two "Physical activity and exercise for osteoarthritis"? 3. How useful did you find module/week three "Body weight and osteoarthritis"? 4. How useful did you find module/week four "Additional management	Responses collected on a 4-point Likert scale with options 1= not at all useful 2 = slightly useful 3 = moderately useful 4 = extremely useful Dichotomised into useful (slightly, moderate, extremely) and not useful (not at all useful) and reported as number and proportion of each category.	5 weeks (experimental group only)	mooc_use1_5w mooc_use2_5w mooc_use3_5w mooc_use4_5w mooc_use5_5w	NA

	strategies and making a plan"? 5. How useful did you find the course, overall?				
Engagement with the OA informational pamphlet	Participants will be asked: "Did you read the osteoarthritis pamphlet you were given as part of this study?"	Response options Yes/No. Reported as number and proportion.	5 weeks (control group only)	pamphlet_use_5w pamphlet_useful_5w	NA
Perceived usefulness of OA informational pamphlet	Participants will be asked "How useful did you find the osteoarthritis pamphlet?"	Responses collected on a 4-point Likert scale with options 1= not at all useful 2 = slightly useful 3 = moderately useful 4 = extremely useful Dichotomised into useful (slightly, moderate, extremely) and not useful (not at all useful) and reported as number and proportion of each category.	5 weeks (control group only)		NA
Use of online courses about OA	Participants will be asked: At 5 weeks: "In the past 5 weeks, have you done any online educational courses about osteoarthritis and its management that involved at least 2 hours of learning?"	The number and proportion reporting "yes" at each timepoint will be reported.	5 and 13 weeks (control group only)	course_use_5w	NA

	At 13 weeks: "In the past 8 weeks, have you done any online educational courses about osteoarthritis and its management that involved at least 2 hours of learning?"				

Baseline Descriptive Measures					
Name	**Description**	**Scale**	**Variable label in spreadsheet**	**Range**	**Better**
Study joint	Extracted during screening process	Reported as Hip or Knee; Number and proportion of participants in each category will be reported.	Derive from study_joint 1, right knee | 2, left knee | 3, right hip | 4, left hip: study_joint_bin: 1(Hip), 2(Knee)	NA	NA
Height	Self-reported	Measured in metres	baseline_height	1+	NA
Body mass index (BMI)	Calculated from height and weight (weight listed in other measures section).	Measured in kg/m^2	BMI0w = baseline_weight /baseline_height^2	1+	NA
Age	Calculated from date of birth.	Captured in years.	(date minus date_of_birth_0w)/365.25 = age0w	45+	NA
Sex	Self-reported via "What was your sex recorded at birth?" Male Female Another term (please specify)	Number and proportion of participants in each category will be reported.	sex	NA	NA

Gender	Self-reported via: "How do you describe your gender? Man or male Woman or female Non-binary I use a different term (please specify) Prefer not to answer	Number and proportion of participants in each category will be reported.	gender	NA	NA
Ethnicity	Self-reported using: Australian/New Zealander Aboriginal and Torres Strait Islander European Asian Other Oceanian North African & Middle Eastern Sub-Saharan African North American South American Other (please list)	Number and proportion of participants responding to each category will be reported.	ethnicity	NA	NA
Duration of symptoms	Participants will self-report the total duration of time since their study joint symptoms.	Captured in years	symptom_duration_years + (sx_duration_months/12)= DurationofsymtomsinYEARS	1+	NA
Geographical location	Determined based on residential postcode and classified according to the Australian Standard Geographical	Number and proportion of participants living in major cities, inner regional, outer regional, remote and very remote locations : 1, Metro | 2, Inner Regional | 3, Outer	Remoteness: =Geographicallocation0w	NA	NA

	Classification (ASGC) Remoteness Structure)	Regional | 4, Remote | 5, Very Remote			
Education level	Participants will report their education level using a categorical scale with response options Did not complete primary school Primary school Secondary school Trade or trade certificate University or tertiary institute Higher university degree Don't know/unsure	Number and proportion of participants responding to each category will be reported.	education	NA	NA
Current employment status	Self-reported current employment status in response to the question: Are you currently in paid employment (casual, part time or full time)? Response options: Yes/No	Number and proportion of participants in paid employment will be reported.	employment_status	NA	NA
Financial situation	Participants will be asked "How would you describe your financial situation?" and self-report from 1 of 6 categories: Find it a strain to get by from week to week	The number and proportion of respondents for each category will be reported.	ses	NA	NA

	Have to be careful with money Able to manage without much difficulty Quite comfortably off Very comfortably off Prefer not to answer				
Comorbidities	Reported using the Self-Administered Comorbidity Questionnaire [13].	The number and proportion of participants reporting each comorbidity will be reported.	The number and proportion of participants reporting at least 1 comorbidity aside from OA (item 11) will be derived.	NA	NA
Confidence using technology in day-to-day life	Rated using a 4-point Likert scale with options of not at all confident, somewhat confident, moderately confident, and extremely confident.	The number and proportion of participants selecting each response option will be reported. Participants will be dichotomised into less confident (not at all and somewhat confident) and more confident (moderately and extremely confident).	tech_confidence	NA	NA
Perceived OA knowledge	Participants will be asked: "How much knowledge do you think you have about osteoarthritis and its management?"	Responses will be captured via a 4-point Likert: 0=None 1=A little 2=Some 3=A lot The number and proportion of participants selecting each response option will be reported.	oa_knowledge	NA	NA
The Health Literacy Questionnaire (HLQ)	44 items, 9 domains: 1. Feeling understood and supported by healthcare providers	Nine individual scores ranging between 1 to 4 (for first 5 scales) and 1 to 5 (for scales 6 to 9) with higher scores	See derived section below.	Scores range between 1 to 4 (for first 5 scales) and 1	NA

	2. Having sufficient information to manage my health 3. Actively managing my health 4. Social support for health 5. Appraisal of health information 6. Ability to actively engage with healthcare providers 7. Navigating the healthcare system 8. Ability to find good health information 9. Understand health information well enough to know what to do	indicating greater health literacy. No overall total score will be derived.		to 5 (for scales 6 to 9).	
Current OA management strategies	Two bespoke questions: For your osteoarthritis, are you currently making efforts to; a. lose weight (e.g. dietary changes)? b. increase the amount and/or intensity of physical activity	Each statement rated as Yes/No. Reported as number/proportion of each response.	wl_efforts ex_effort	NA	NA

	and/or exercise you do?				
Past care seeking	Participants will be asked: Have you ever sought care for your knee or hip pain from any health professional before?	Rated as Yes/No. Reported as number/proportion of each response.	past_care	NA	NA
Current care seeking	Participants will be asked: "In the past month, have you seen a health professional for advice about your osteoarthritis? Yes/No Those selecting "yes" will be asked to select all that apply from: 1. General practitioner 2. Physiotherapist 3. Exercise physiologist 4. Dietician 5. Psychologist 6. Pharmacist 7. Podiatrist 8. Occupational therapist 9. Rheumatologist	Reported as number/proportion for each response.	current_care_1 current_care current_care_1b	NA	NA

	10. Sports and exercise physician 11. Orthopaedic surgeon 12. Other [specify]				

Appendix 2

DEFINITIONS OF DERIVED VARIABLES IN THE DATA SET

Name	Description	Calculation	Variable label in spreadsheet	Range	Better
Primary Outcome					
Knee/Hip Osteoarthritis Knowledge Scale (KOAKS/HOAKS)[3]	Scored using 11 statements regarding - osteoarthritis disease knowledge - principles of management - treatment approaches of exercise, physical activity, weight loss, surgery. Baseline, 5 and 13 weeks	Each statement rated using a 5-point Likert scale (False (1), Possibly False (2), Unsure (3), Possibly True (4), or True (5)) Items 1,2, 3, 4, 7, and 11 scored in reverse. All item scores are added for a total score range of 11 to 55. Higher scores indicate more accurate knowledge about osteoarthritis.	see previous section	11-55	↑
Arthritis Self-Efficacy Scale (Pain subscale)[10]	Scored from 5 questions relating to the level of certainty that one can function despite pain. Baseline, 5 and 13 weeks	Each statement rated using an 10-point Numerical Rating Scale (NRS) where 1=Very uncertain and 10=Very certain. Scores are the mean of all the items in the subscale (range 1-10). Higher scores indicate greater self-efficacy.	see previous section	1-10	↑
Change in (follow up minus baseline) Knee/Hip Osteoarthritis Knowledge Scale (KOAKS/HOAKS)[3]	Baseline, 5 and 13 weeks	Change in (each follow up timepoint minus baseline)	see previous section- "D" prefix	11-55	↑
Change in (follow up minus baseline) Arthritis Self-Efficacy Scale (Pain subscale)[10]	Baseline, 5 and 13 weeks	Change in (each follow up timepoint minus baseline)	see previous section- "D" prefix	1-10	↑

Name	Description	Calculation	Variable label in spreadsheet	Range	Better

Secondary Outcomes					
Brief fear of movement for OA scale[14]	Scored from 6 statements regarding fear of injury/re-injury due to movement. Baseline, 5 and 13 weeks	Each statement rated using a 4-point Likert scale from 1=Strongly disagree to 4=Strongly agree. All item scores are added for a total score range of 6 (minimal fear) to 24 (maximal fear).	see previous section	6-24	↓
Self-efficacy for Exercise Scale[12]	Scored using a nine-item scale that assesses self-efficacy expectations about ability to continue exercising in the face of perceived barriers. Baseline, 5 and 13 weeks	Items are scored on an 11-point NRS from "not confident" to "very confident". Total scores range from 9 to 90, higher scores indicating higher self-efficacy.	see previous section	0-90	↑
Brief Illness Perceptions Questionnaire (B-IPQ)[1]	Scored from eight items that assess dimensions of: Identity, Timeline, Consequences, and Cure-Control. We will not capture item 9 of the B-IPQ which is an open-ended question related to causes of illness. For each item, 'Illness' will be replaced with 'osteoarthritis'. Baseline, 5 and 13 weeks	Each item is scored on a Likert scale from 0 to 10. An overall score will be computed which represents the degree to which the illness is perceived as threatening or benign. To compute the score, score items 3, 4, and 7 will be reversed and added to items 1, 2, 5, 6, and 8. Higher scores represent a more threatening view of the illness.	see previous section	0-80	↓
Incidental and Planned Exercise Questionnaire, version W (IPEQ-W) [4]	The IPEQ-W will capture physical activity / exercise behaviour during the past week via two levels of physical activity, i.e., planned activities that focus on planned exercise and planned walks (Q1–Q6) and incidental activities that focus on more casual day-to-day activities (Q7–Q10) at baseline and 13 weeks.	Reported on a scale of 0–128; higher scores indicate higher levels of activity.	see previous section	0–128	↑

Current exercise/physical activity behaviour	Bespoke question at 13 weeks: Over the past 2 weeks, how would you compare your amount of physical activity/exercise to when you started the study?	Response options on a 3 point-Likert with options Less Same More Dichotomised into 'more' and 'not more' = (less and same)	see previous section	N/A	N/A
Oral pain medication usage	At baseline and 13 weeks, participants will self-report the use of common oral pain-relieving medications taken at least once a week in the prior month for knee/hip pain by selecting Yes/No from options: i. oral non-steroidal anti-inflammatory drugs ii. analgesics (paracetamol combinations), iii. oral corticosteroids and iv. oral opioids	Response options Yes/No. Number and proportion of participants using any oral pain medication for hip/knee pain at least once a week in the prior month will be reported.	see previous section	N/A	N/A
At least 1 medication at baseline and 13 weeks (each timepoint separately)	0,1	At least 1 of anti_inflam_tablets_0w analgesia_paracet_0w oral_corticosteroids_0w oral_opioids_0w	Atleastonemed0 Atleastonemed13	NA	NA
Change in (follow up minus baseline) Brief fear of movement for OA scale[14]	Baseline, 5 and 13 weeks	Change in (each follow up timepoint minus baseline)	see previous section- "D" prefix	6-24	↓
Change in (follow up minus baseline) Self-efficacy for Exercise Scale[12]	Baseline, 5 and 13 weeks	Change in (each follow up timepoint minus baseline)	see previous section- "D" prefix	0-90	↑
Change in (follow up minus baseline) Brief Illness Perceptions Questionnaire (B-IPQ)[1]	Baseline, 5 and 13 weeks	Change in (each follow up timepoint minus baseline)	see previous section- "D" prefix	0-80	↓

Change in (follow up minus baseline) Incidental and Planned Exercise Questionnaire, version W (IPEQ-W) [4]	Baseline and 13 weeks	Change in (each follow up timepoint minus baseline)	see previous section- "D" prefix	0–128	↑

Name	Description	Calculation	Variable label in spreadsheet	Range	Better
Clinical Measures					
Physical function	Scored using the 17 questions of the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) physical function subscale. Baseline and 13 weeks	Rated using a 5-point Likert scale with response options ranging from no dysfunction to extreme dysfunction. Ranges from 0 (no dysfunction) to 68 (maximum dysfunction).	See previous section	0-68	↓

Name	Description	Calculation	Variable label in spreadsheet	Range	Better
Process measures					
Perceived usefulness of MOOC modules for OA self-management	5 weeks (experimental group only) Participants will answer 5 bespoke questions: 1. How useful did you find module/week one, "Learning about osteoarthritis"? 2. How useful did you find module/week two "Physical activity and exercise for osteoarthritis"? 3. How useful did you find module/week three "Body weight and osteoarthritis"? 4. How useful did you find module/week four "Additional management strategies and making a plan"?	Responses collected on a 4-point Likert scale with options 1= not at all useful 2 = slightly useful 3 = moderately useful 4 = extremely useful Dichotomised into useful (slightly, moderate, extremely) and not useful (not at all useful) and reported as number and proportion of each category.	see previous section	NA	NA

	5. How useful did you find the course, overall?				
Perceived usefulness of OA informational pamphlet	5 weeks (control group only) Participants will be asked "How useful did you find the osteoarthritis pamphlet?"	Responses collected on a 4-point Likert scale with options 1= not at all useful 2 = slightly useful 3 = moderately useful 4 = extremely useful Dichotomised into useful (slightly, moderate, extremely) and not useful (not at all useful) and reported as number and proportion of each category.	see previous section	NA	NA

Name	Description	Calculation	Variable label in spreadsheet	Range	Better
Baseline Descriptive Measures					
Body mass index (BMI)	Measured in kg/m^2	Calculated from height and weight (weight listed in other measures section).	BMI0w	1+	NA
Age	Captured in years.	Calculated from date of birth.	See previous section	45+	
Duration of symptoms	Participants will self-report the total duration of time since their study joint symptoms.	Captured in years	See previous section	1+	
Confidence using technology in day-to-day life	Rated using a 4-point Likert scale with options of not at all confident, somewhat confident, moderately confident, and extremely confident.	The number and proportion of participants selecting each response option will be reported. Participants will be dichotomised into less confident (not at all and somewhat confident) and more confident (moderately and extremely confident).	see previous section	NA	
The Health Literacy Questionnaire (HLQ)	44 items, 9 domains: 1. Feeling understood and supported by healthcare providers 2. Having sufficient information to manage my health 3. Actively managing my health	Nine scores range between 1 to 4 (for first 5 scales) and 1 to 5 (for scales 6 to 9) with higher scores	Each scales score is an average of the items within the scale- see	Scores range between 1 to 4 (for first 5 scales)	

	4. Social support for health 5. Appraisal of health information 6. Ability to actively engage with healthcare providers 7. Navigating the healthcare system 8. Ability to find good health information 9. Understand health information well enough to know what to do	indicating greater health literacy. 1. Feeling understood and supported by healthcare providers hlq_1_2 hlq1_2_8 hlq1_3_17 hlq1_4_22 2. Having sufficient information to manage my health Hlq_1_1 Hlq1_2_10 Hlq1_3_14 Hlq1_4_23 3. Actively managing my health Hlq_1_6 Hlq1_2_9 Hlq1_3_13 Hlq1_3_18 Hlq1_4_21 4. Social Support for health Hlq_1_3 Hlq_1_5 Hlq1_2_11 Hlq1_3_15 Hlq1_4_19 5. Appraisal of health information Hlq_1_4 Hlq1_2_7 Hlq1_2_12 Hlq1_3_16 Hlq1_4_20 6. Ability to actively engage with healthcare providers Hlq2_1_2 (this is question 25) Hlq2_1_4 (this is question 27)	also previous section: hlq1-hlq9	and 1 to 5 (for scales 6 to 9).	

		Hlq2_2_7 (this is question 30) Hlq2_3_15 (this is question 38) Hlq2_4_20 (this is question 43) 7. Navigating the healthcare system Hlq2_1_1 (this is question 24) Hlq2_2_8 (this is question 17) Hlq2_3_11 (this is question 34) Hlq2_3_13 (this is question 36) Hlq2_4_16 (this is question 39) Hlq2_4_19 (this is question 42) 8. Ability to find good health information Hlq2_1_3 (this is question 26) Hlq2_2_6 (this is question 29) Hlq2_2_10 (this is question 33) Hlq2_3_14 (this is question 37) Hlq2_4_18 (this is question 41) 9. Understanding health information well enough to know what to do Hlq2_1_5 (this is question 28) Hlq2_2_9 (this is question 32) Hlq2_3_12 (this is question 35) Hlq2_4_17 (this is question 40) Hlq2_4_21 (this is question 44)			

Appendix 3

LIST OF TABLES/FIGURES/LISTINGS

Number	**Title – analysis set**
Table 1	Baseline characteristics of participants by group.
Table 2	Mean (SD) scores on continuous outcome measures across time, by group.
Table 3	Change in continuous outcome measures within groups and between groups over time.
Table 4	Binary secondary outcomes and adjusted relative risks.
Table 5	Process measures.
Table 6	Clinical measures.
Appendix 1	Baseline characteristics and outcomes of participants who did and did not complete both primary outcomes at 5 weeks, reported as mean (standard deviation) unless otherwise stated.
Appendix 2	Health professional care seeking behaviours: intention to see a health professional at 5 weeks and health professional consulted at 13 weeks.
Other appendices	For any outcomes where >5% of outcome data is missing, analysis results for missing not at random (MNAR) data using multiply-imputed data with the pattern mixture method.
Other appendices	For outcomes not analysed using the cLDA model, if primary results use multiply imputed data, analysis results using complete case data.

Appendix 4

Table 1. Baseline characteristics of participants by group, reported as mean (standard deviation) unless otherwise stated.

Domain	Group 1 [N = xxx]	Group 2 [N = xxx]
Age (years)		
Sex, n (%)		
Male		
Female		
Another term		
Gender, n (%)		
Man or male		
Woman or female		
Non-binary		
Prefer not to answer		
I use a different term		
Height (m)		
Body mass index (kg/m^2), median (IQR)		
Study joint, n (%)		
Hip		
Knee		
Ethnicity, n (%)		
Australian/New Zealander		
Aboriginal and/or Torres Strait Islander		
European		
Asian		
Other Oceanian		
North African & Middle Eastern		
Sub-Saharan African		
North American		
South American		
Other		
Duration of symptoms (years), median (IQR)		
Geographical location~, n (%)		
Major city		
Inner regional		
Outer regional		
Remote		
Very remote		
Highest education level, n (%)		
Primary school		
Secondary school		
Trade or trade certificate		
University or tertiary institute		
Higher university degree		
Don’t know/unsure		

Currently in paid employment, n (%)
Financial situation, n (%)
  Find it a strain to get by from week to week
  Have to be careful with money
  Able to manage without much difficulty
  Quite comfortably off
  Very comfortably off
  Prefer not to answer
Comorbid conditions, n (%)
  ≥1 Comorbid condition^
    Heart disease
    High blood pressure
    Lung disease
    Diabetes
    Ulcer or stomach disease
    Kidney disease
    Liver disease
    Anaemia or other blood disease
    Cancer
    Depression
    Osteoarthritis
    Back pain
    Rheumatoid arthritis
    Other
Confidence using technology in day-to-day life, n (%)
  Not at all/somewhat confident
  Moderately/extremely confident
Perceived OA knowledge*, n (%)
  None
  A little
  Some
  A lot
The Health Literacy Questionnaire, median (IQR)
  1. Feeling understood and supported by healthcare providers
  2. Having sufficient information to manage my health
  3. Actively managing my health
  4. Social support for health
  5. Appraisal of health information
  6. Ability to actively engage with healthcare providers
  7. Navigating the healthcare system
  8. Ability to find good health information
  9. Understand health information well enough to know what to do
Current OA management strategies, n (%)
  Efforts to lose weight
  Efforts to increase amount/intensity of physical activity/exercise

Past care seeking from a health professional for hip/knee OA, n (%)	
Current care seeking for OA, n (%)	
General practitioner	
Physiotherapist	
Exercise physiologist	
Dietician	
Psychologist	
Pharmacist	
Podiatrist	
Occupational therapist	
Rheumatologist	
Sports and exercise physician	
Orthopaedic surgeon	
Other	

IQR = interquartile range (25th to 75th percentile); OA = osteoarthritis.

˜Based on residential postcode, in accordance with Australian Statistical Geography Standard.

^Excludes osteoarthritis.

*Participants were asked: "How much knowledge do you think you have about osteoarthritis and its management?"

Table 2. Mean (SD) scores on continuous outcome measures across time, by group.

	Baseline		5-weeks^		13-weeks^^	
	Group 1 (n=xxx)	Group 2 (n=xxx)	Group 1 (n=xxx)	Group 2 (n=xxx)	Group 1 (n=xxx)	Group 2 (n=xxx)
Primary outcomes						
Knee/Hip Osteoarthritis Knowledge Scale (OAKS)						
Arthritis Self-Efficacy Scale (Pain subscale) (ASES)						
Secondary outcomes						
Brief fear of movement for OA scale (BFMS)						
Self-efficacy for Exercise Scale (SEE)						
Brief Illness Perceptions Questionnaire (B-IPQ)						
Incidental and Planned Exercise Questionnaire, version W (IPEQ-W)			——	——		

SD = standard deviation; OAKS range 11-55, higher scores represent more accurate knowledge about OA, increase indicates improvement; ASES pain subscale range 1-10, higher scores represent greater pain self-efficacy, increase indicates improvement; OA = osteoarthritis; BFMS range 6-24, higher scores represent more fear, increase indicates worse; SEE range 0-90, higher scores represent higher self-efficacy, increase indicates improvement; B-IPQ range 0-80, higher scores represent a more threatening view of OA, increase indicates worse; IPEQ-W range 0-128, higher scores represent higher levels of total activity, increase indicates improvement.

^ Correlation of 5 week scores with baseline continuous outcome scores:

- Group 1
- Group 2

^^ Correlation of 13 week scores with baseline continuous outcome scores:

- Group 1
- Group 2

Table 3. Change in continuous outcome measures within groups and between groups over time.

	Mean (SD) change within groups 5-weeks minus baseline		Difference in change between groups at 5-weeks [a] Group 1 vs Group 2		Mean (SD) change within groups 13-weeks minus baseline		Difference in change between groups at 13-weeks [a] Group 1 vs Group 2	
	Group 1 (n=xxx)	Group 2 (n=xxx)	Mean (95% CI) (n=xxx)	P-value	Group 1 (n=xxx)	Group 2 (n=xxx)	Mean (95% CI) (n=xxx)	P-value
Primary outcomes								
Knee/Hip Osteoarthritis Knowledge Scale (OAKS) [b]								
Arthritis Self-Efficacy Scale (Pain subscale) (ASES) [b]								
Secondary outcomes								
Brief fear of movement for OA scale (BFMS) [c]								
Self-efficacy for Exercise Scale (SEE) [b]								
Brief Illness Perceptions Questionnaire (B-IPQ) [c]								
Incidental and Planned Exercise Questionnaire, version W (IPEQ-W) [b]	———	———	———	———				

SD = standard deviation; CI = confidence interval; OAKS range 11-55, higher scores represent more accurate knowledge about OA, increase indicates improvement; ASES pain subscale range 1-10, higher scores represent greater pain self-efficacy, increase indicates improvement; OA = osteoarthritis; BFMS range 6-24, higher scores represent more fear, increase indicates worse; SEE range 0-90, higher scores represent higher self-efficacy, increase indicates improvement; B-IPQ range 0-80, higher scores represent a more threatening view of OA, increase indicates worse; IPEQ-W range 0-128, higher scores represent higher levels of total activity, increase indicates improvement.

[a] Mean (95% CI) difference in change scores between groups, adjusted for the outcome at baseline and stratifying variable (hip or knee), estimated using separate models for each outcome. Multiplicity adjusted two-sided 95% confidence intervals and p-values for the primary outcomes at 5 weeks are presented. An available case analysis was used for handling missing data for outcomes with two follow-up periods and multiple imputation for outcomes with one follow-up period.

[b] For change within groups, positive changes indicate improvement. For difference in change between groups, positive differences favor Group 1.

[c] For change within groups, negative changes indicate improvement. For difference in change between groups, negative differences favor Group 1.

Table 4: Binary outcomes and adjusted relative risks.

	Group 1 n/Total (%)	Group 2 n/Total (%)	Relative risk* (95% CI)	P-value
5-weeks				
Management intentions for:				
1. Increasing physical activity/exercise in the next 2 months				
2. Reducing time spent being sedentary in the next 2 months				
3. Efforts to lose weight in the next 2 months				
4. Having joint replacement surgery in the next 2 years				
Intention to seek care from a health professional in the next 2 months for:				
1. weight loss				
2. an exercise/physical activity program				
3. pain relieving medication				
4. joint replacement surgery				
13-weeks				
Current exercise/physical activity behaviour[a]				
Current weight loss behaviour[b]				
Current care seeking behaviour for:				
1. weight loss				
2. an exercise/physical activity program				
3. pain relieving medication				

4. joint replacement surgery

Oral pain medication usage[c]

CI=confidence intervals. The counts and proportions are based on the available (observed data).

[a] Participants were asked "Over the past 2 weeks, how would you compare your amount of physical activity/exercise to when you started the study?". Rated using 3-point scale of less, same, more, with those indicating less and same classified as "not more". Risk of "more" reported.

[b] Participants were asked "In the past 2 WEEKS, did you make any effort to lose weight (e.g. diet changes)?" with response options yes/no. Risk of "yes" reported.

[c] Self-reported use of common oral pain-relieving medications taken at least once a week in the prior month for knee/hip pain. Baseline oral pain medication usage, n/Total (%):

- Group 1:
- Group 2:

Table 5. Process measures.

Measure	Intervention	Control
eLearning modules completed, n (%)		
Week 1: Learning about OA		——
Week 2: Physical activity and exercise for OA		——
Week 3: Body weight and OA		——
Week 4: Additional management strategies and making a plan		——
Perceived usefulness of elearning modules for OA self-management, n (%)		
Week 1 useful		——
Week 2 useful		——
Week 3 useful		——
Week 4 useful		——
Overall found course useful		——
Used OA informational pamphlet [a]	——	
Perceived usefulness of OA informational pamphlet		
Useful	——	
Used an online course about OA[b]		
5 weeks	——	
13 weeks	——	

OA = osteoarthritis.

[a] Participants were asked "Did you read the osteoarthritis pamphlet you were given as part of this study?"

[b] Participant were asked at 5 weeks: "In the past 5 weeks, have you done any online educational courses about osteoarthritis and its management that involved at least 2 hours of learning?" and at 13 weeks: "In the past 8 weeks, have you done any online educational courses about osteoarthritis and its management that involved at least 2 hours of learning?"

Table 6. Clinical measures, presented as mean (SD).

	Baseline		13-weeks	
	Group 1	**Group 2**	**Group 1**	**Group 2**
	(n=xxx)	**(n=xxx)**	**(n=xxx)**	**(n=xxx)**
Physical function subscale (WOMAC)				
Severity of knee/hip pain during walking (NRS)				
Weight (kgs)				

SD=standard deviation; WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index, range 0-68, higher represents greater dysfunction, increase indicates worse; NRS = numerical rating scale, range 0-10, higher scores represent worse pain, increase indicates worse.

^A negative change within groups is an improvement.

^^A negative mean (SD) difference in change between groups favours Group 1.

Appendix 1. Baseline characteristics of participants who did and did not complete both primary outcomes, reported as mean (standard deviation) unless otherwise stated.

Domain	Incomplete one or both primary outcomes [n = xxx]	Completed both primary outcomes [n = xxx]
Group, n (%)		
Group 1		
Group 2		
Age (years)		
Sex, n(%)		
Male		
Female		
Another term		
Gender, n (%)		
Man or male		
Woman or female		
Non-binary		
Prefer not to answer		
I use a different term		
Height (m)		
Body mass index, (kg/m^2)		
Study joint, n (%)		
Hip		
Knee		
Ethnicity, n (%)		
Australian/New Zealander		
Aboriginal and/or Torres Strait Islander		
European		
Asian		
Other Oceanian		
North African & Middle Eastern		
Sub-Saharan African		
North American		
South American		
Other		
Duration of symptoms (years)		
Geographical location~, n (%)		
Major city		
Inner regional		
Outer regional		
Remote		
Very remote		
Highest education level, n (%)		
Primary school		
Secondary school		

- Trade or trade certificate
- University or tertiary institute
- Higher university degree
- Don’t know/unsure

Currently in pain employment, n (%)

Financial situation, n (%)
- Find it a strain to get by from week to week
- Have to be careful with money
- Able to manage without much difficulty
- Quite comfortably off
- Very comfortably off
- Prefer not to answer

Comorbid conditions, n (%)
- ≥1 Comorbid condition^
  - Heart disease
  - High blood pressure
  - Lung disease
  - Diabetes
  - Ulcer or stomach disease
  - Kidney disease
  - Liver disease
  - Anaemia or other blood disease
  - Cancer
  - Depression
  - Osteoarthritis
  - Back pain
  - Rheumatoid arthritis
  - Other

Confidence using technology in day-to-day life, n (%)
- Not at all confident
- Somewhat confident
- Moderately confident
- Extremely confident

Perceived OA knowledge*, n (%)
- None
- A little
- Some
- A lot

The Health Literacy Questionnaire, median (IQR)
- 1. Feeling understood and supported by healthcare providers
- 2. Having sufficient information to manage my health
- 3. Actively managing my health
- 4. Social support for health
- 5. Appraisal of health information
- 6. Ability to actively engage with healthcare providers
- 7. Navigating the healthcare system
- 8. Ability to find good health information

9. Understand health information well enough to know what to do	
Current OA management strategies, n (%)	
Efforts to lose weight	
Efforts to increase amount/intensity of physical activity/exercise	
Past care seeking from a health professional for hip/kneeOA, n (%)	
Current care seeking for OA, n (%)	
General practitioner	
Physiotherapist	
Exercise physiologist	
Dietician	
Psychologist	
Pharmacist	
Podiatrist	
Occupational therapist	
Rheumatologist	
Sports and exercise physician	
Orthopaedic surgeon	
Other	
Knee/Hip Osteoarthritis Knowledge Scale (OAKS)	
Arthritis Self-Efficacy Scale (Pain subscale) (ASES)	
Brief fear of movement for OA scale (BFMS)	
Self-efficacy for Exercise Scale (SEE)	
Brief Illness Perceptions Questionnaire (B-IPQ)	
Incidental and Planned Exercise Questionnaire, version W (IPEQ-W)	
Oral pain medication usage[c], n (%)	

IQR = interquartile range (25th to 75th percentile); OA = osteoarthritis; OAKS range 11-55, higher scores represent more accurate knowledge about OA, increase indicates improvement; ASES pain subscale range 1-10, higher scores represent greater pain self-efficacy, increase indicates improvement; BFMS range 6-24, higher scores represent more fear, increase indicates worse; SEE range 0-90, higher scores represent higher self-efficacy, increase indicates improvement; B-IPQ range 0-80, higher scores represent a more threatening view of OA, increase indicates worse; IPEQ-W range 0-128, higher scores represent higher levels of total activity, increase indicates improvement.

~Based on residential postcode, in accordance with Australian Statistical Geography Standard.

^Excludes osteoarthritis.

*Participants were asked: "How much knowledge do you think you have about osteoarthritis and its management?"

[c] Self-reported use of common oral pain-relieving medications taken at least once a week in the prior month for knee/hip pain.

Appendix 2. Health professional care seeking behaviours: intention to see a health professional at 5 weeks and health professional consulted at 13 weeks.

Behaviour	Group 1 [N = xxx]	Group 2 [N = xxx]
Intention to see a health professional at 5 weeks, n (%)		
General practitioner		
Physiotherapist		
Exercise physiologist		
Dietician		
Psychologist		
Pharmacist		
Podiatrist		
Occupational therapist		
Rheumatologist		
Sports and exercise physician		
Orthopaedic surgeon		
Other		
Health professional consulted at 13 weeks, n (%)		
General practitioner		
Physiotherapist		
Exercise physiologist		
Dietician		
Psychologist		
Pharmacist		
Podiatrist		
Occupational therapist		
Rheumatologist		
Sports and exercise physician		
Orthopaedic surgeon		
Other		