Article title
Pharmacist interventions in osteoporosis management: a systematic review

Journal name
Osteoporosis International

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Online Resource 2 Review protocol

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Systematic review

*Fields that have an **asterisk (*)** next to them means that they **must be answered**. **Word limits** are provided for each section. You will be unable to submit the form if the word limits are exceeded for any section. Registrant means the person filling out the form.*

1. * Review title.

Give the title of the review in English

Pharmacist interventions for osteoporosis management: a systematic literature review

2. Original language title.

For reviews in languages other than English, give the title in the original language. This will be displayed with the English language title.

3. * Anticipated or actual start date.

Give the date the systematic review started or is expected to start.

01/11/2021

4. * Anticipated completion date.

Give the date by which the review is expected to be completed.

31/03/2022

5. * Stage of review at time of this submission.

This field uses answers to initial screening questions. It cannot be edited until after registration.

Tick the boxes to show which review tasks have been started and which have been completed.

Update this field each time any amendments are made to a published record.

The review has not yet started: No

Review stage	Started	Completed
Preliminary searches	Yes	No
Piloting of the study selection process	No	No
Formal screening of search results against eligibility criteria	No	No
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

Provide any other relevant information about the stage of the review here.

6. * Named contact.

The named contact is the guarantor for the accuracy of the information in the register record. This may be any member of the review team.

Catherine Laird

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:
Catherine

7. * Named contact email.

Give the electronic email address of the named contact.

catherine.d.laird@student.uts.edu.au

8. Named contact address

PLEASE NOTE this information will be published in the PROSPERO record so please do not enter private information, i.e. personal home address

Give the full institutional/organisational postal address for the named contact.

Graduate School of Health
University of Technology Sydney

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

+61447148848

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.

University of Technology Sydney

Organisation web address:

11. * Review team members and their organisational affiliations.

Give the personal details and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong. **NOTE: email and country now MUST be entered for each person, unless you are amending a published record.**

Miss Catherine Laird. University of Technology Sydney

Dr Helen Benson. University of Technology Sydney

Professor Kylie Williams. University of Technology Sydney

12. * Funding sources/sponsors.

Details of the individuals, organizations, groups, companies or other legal entities who have funded or sponsored the review.

This systematic review is undertaken as part of Catherine Laird postgraduate research candidature for which she is a recipient of an Australian Government Research Training Program (RTP) Domestic Stipend Scholarship

Grant number(s)
State the funder, grant or award number and the date of award

13. * Conflicts of interest.

List actual or perceived conflicts of interest (financial or academic).

None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members. **NOTE: email and country must be completed for each person, unless you are amending a published record.**

15. * Review question.

State the review question(s) clearly and precisely. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS or similar where relevant.

The objective is to review current evidence pertaining to pharmacist interventions in the management of osteoporosis in adults.

P- adult population with or at risk of osteoporosis
I- interventions conducted by pharmacists
C- usual care
O- screening, diagnosis, treatment uptake, adherence

16. * Searches.

State the sources that will be searched (e.g. Medline). Give the search dates, and any restrictions (e.g. language or publication date). Do NOT enter the full search strategy (it may be provided as a link or attachment below.)

An extensive literature search will be undertaken utilising PubMed, EMBASE, CINAHL and International Pharmaceutical Abstracts in November 2021. This search will be from inception of each database up to November 2021. Searches will be re-run prior to the final anaylsis
Additionally, a search for grey literature will be undertaken and reference lists of included studies will be manually searched

17. URL to search strategy.

Upload a file with your search strategy, or an example of a search strategy for a specific database, (including the keywords) in pdf or word format. In doing so you are consenting to the file being made publicly accessible.

Or provide a URL or link to the strategy. Do NOT provide links to your search **results**.

Do not make this file publicly available until the review is complete

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied in your systematic review.

Osteoporosis

19. * Participants/population.

Specify the participants or populations being studied in the review. The preferred format includes details of both inclusion and exclusion criteria.

Adults (>18 yrs of age) with or at risk of osteoporosis

Adolescents and children (<18 yrs) will be excluded

20. * Intervention(s), exposure(s).

Give full and clear descriptions or definitions of the interventions or the exposures to be reviewed. The preferred format includes details of both inclusion and exclusion criteria.

Interventions carried out by a pharmacist with primary purpose to improve osteoporosis management (screening, diagnosis, treatment uptake or adherence) in any practice setting will be included.
Interventions undertaken collaboratively by health professionals will be included if it is stipulated a pharmacist is a member of the health professional team.
With respect to pharmacological treatments all treatments indicated for osteoporosis will be included: ie. antiresorptive, anabolic, Calcium and Vit D, SERMS and HRT

Interventions that do not involve a pharmacist are excluded
Interventions for which osteoporosis management is not the primary focus are excluded

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the intervention/exposure will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.

Usual care or no intervention

22. * Types of study to be included.

Give details of the study designs (e.g. RCT) that are eligible for inclusion in the review. The preferred format includes both inclusion and exclusion criteria. If there are no restrictions on the types of study, this should be stated.

RCTs will be included
Only articles published in english as full text will be included

All other study types will be excluded

23. Context.

Give summary details of the setting or other relevant characteristics, which help define the inclusion or exclusion criteria.

Studies carried out in any practice setting will be included

24. * Main outcome(s).

Give the pre-specified main (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.

In light of the array of interventions anticipated to be undertaken, outcomes do not form part of the inclusion/exclusion criteria.
It is anticipated outcomes will include: screening for osteoporosis (either BMD or completion of screening tool eg. GARVAN, FRAX)
Prescription for osteoporosis therapy
Commencement of osteoporosis therapy
Adherence to osteoporosis therapy

Measures of effect

25. * Additional outcome(s).

List the pre-specified additional outcomes of the review, with a similar level of detail to that required for main outcomes. Where there are no additional outcomes please state 'None' or 'Not applicable' as appropriate to the review

Not applicable

Measures of effect

26. * Data extraction (selection and coding).

Describe how studies will be selected for inclusion. State what data will be extracted or obtained. State how this will be done and recorded.

Results of literature search will be screened in a two stage process (title and abstract followed by full-text) independently by 2 authors, with any disagreements resolved firstly through discussion, and if required involvement of the third author. A customized excel sheet will be utilized to record reason for exclusion of articles at both stages of the screening process.
Two reviews will independently assess the quality of the selected studies utilizing CASP checklist, whilst risk of bias will be assessed utilized the Cochrane Risk of Bias tool.
Data extraction will be undertaken by two authors utilizing a customized excel sheet. Data extraction tables will be matched to confirm main findings are documented. Any disagreements will be resolved by involvement of the third author. The customized excel sheet will include: research design, setting, patient inclusion criteria, patient recruitment, pharmacist training, intervention details and outcomes

27. * Risk of bias (quality) assessment.

State which characteristics of the studies will be assessed and/or any formal risk of bias/quality assessment tools that will be used.

Risk of bias will be assessed utilizing the Cochrane Risk of Bias tool relevant for study type

28. * Strategy for data synthesis.

Describe the methods you plan to use to synthesise data. This **must not be generic text** but should be **specific to your review** and describe how the proposed approach will be applied to your data.

If meta-analysis is planned, describe the models to be used, methods to explore statistical heterogeneity, and software package to be used.

In light of the anticipated heterogeneity of both interventions and reporting of outcomes, a narrative review of studies is planned

29. * Analysis of subgroups or subsets.

State any planned investigation of 'subgroups'. Be clear and specific about which type of study or participant will be included in each group or covariate investigated. State the planned analytic approach.

Analysis of subgroups will be context dependent

30. * Type and method of review.

Select the type of review, review method and health area from the lists below.

Type of review

Cost effectiveness	No
Diagnostic	No
Epidemiologic	No
Individual patient data (IPD) meta-analysis	No
Intervention	Yes
Living systematic review	No
Meta-analysis	No
Methodology	No
Narrative synthesis	Yes
Network meta-analysis	No
Pre-clinical	No
Prevention	No
Prognostic	No

Prospective meta-analysis (PMA)	No
Review of reviews	No
Service delivery	No
Synthesis of qualitative studies	No
Systematic review	Yes
Other	No

Health area of the review

Alcohol/substance misuse/abuse	No
Blood and immune system	No
Cancer	No
Cardiovascular	No
Care of the elderly	No
Child health	No
Complementary therapies	No
COVID-19	No
Crime and justice	No
Dental	No
Digestive system	No
Ear, nose and throat	No
Education	No

Endocrine and metabolic disorders	No
Eye disorders	No
General interest	No
Genetics	No
Health inequalities/health equity	No
Infections and infestations	No
International development	No
Mental health and behavioural conditions	No
Musculoskeletal	Yes
Neurological	No
Nursing	No
Obstetrics and gynaecology	No
Oral health	No
Palliative care	No
Perioperative care	No
Physiotherapy	No
Pregnancy and childbirth	No
Public health (including social determinants of health)	No
Rehabilitation	No
Respiratory disorders	No

Service delivery	No
Skin disorders	No
Social care	No
Surgery	No
Tropical Medicine	No
Urological	No
Wounds, injuries and accidents	No
Violence and abuse	No

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error.

English

There is not an English language summary

32. * Country.

Select the country in which the review is being carried out. For multi-national collaborations select all the countries involved.

Australia

33. Other registration details.

Name any other organisation where the systematic review title or protocol is registered (e.g. Campbell, or The Joanna Briggs Institute) together with any unique identification number assigned by them.
If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

If the protocol for this review is published provide details (authors, title and journal details, preferably in Vancouver format)

No I do not make this file publicly available until the review is complete

35. Dissemination plans.

Do you intend to publish the review on completion?

Yes

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords help PROSPERO users find your review (keywords do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

osteoporosis, pharmacist, intervention

37. Details of any existing review of the same topic by the same authors.

If you are registering an update of an existing review give details of the earlier versions and include a full bibliographic reference, if available.

38. * Current review status.

Update review status when the review is completed and when it is published.
New registrations must be ongoing so this field is not editable for initial submission.

Review_Ongoing

39. Any additional information.

Provide any other information relevant to the registration of this review.

40. Details of final report/publication(s) or preprints if available.

Leave empty until publication details are available OR you have a link to a preprint (NOTE: this field is not editable for initial submission).
List authors, title and journal details preferably in Vancouver format.

Protocol amendments

Amendment	Reason for amendment	Stage of the review process at which amendment implemented
Review question PICO C- usual care Changed to C-usual care or alternative intervention	To broaden the number of pharmacist interventions evaluated in this review	During abstract screening
Data extraction and quality appraisal changed from being completed by two authors, to being completed by one author	Due to the personal circumstances of one author, time limitations would have prevented the review from being completed in a timely manner.	During full-text screening
Anticipated completion date: extended from March 2022 to June 2022	Considering time taken to complete the review was greater than that originally planned. The literature search was re-ran to ensure no articles published between the original search and completion of the review were omitted	Data synthesis
Title changed from "interventions in osteoporosis" to "interventions for osteoporosis"	Grammatical correction	Data synthesis