

# Systematic review of evidence on the clinical effectiveness of Bowen therapy

Protocol prepared by  
Cochrane Australia

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## Contents

|                                                                                       |          |
|---------------------------------------------------------------------------------------|----------|
| Authors and contributors to the protocol                                              | 4        |
| Declarations of interest                                                              | 4        |
| Funding                                                                               | 4        |
| <b>1. Background</b>                                                                  | <b>5</b> |
| 1.1 Description of the intervention                                                   | 5        |
| 1.2 How Bowen therapy might work                                                      | 6        |
| 1.3 Description of conditions for which Bowen therapy is used                         | 6        |
| 1.4 Why it is important to do this review                                             | 6        |
| <b>2. Objectives</b>                                                                  | <b>7</b> |
| Primary objectives                                                                    | 7        |
| Secondary objectives                                                                  | 7        |
| <b>3. Methods</b>                                                                     | <b>7</b> |
| 3.1 Criteria for considering studies for this review                                  | 8        |
| 3.1.1 Types of studies                                                                | 9        |
| 3.1.2 Types of participants                                                           | 10       |
| 3.1.3 Types of interventions                                                          | 11       |
| 3.1.4 Types of outcomes                                                               | 12       |
| 3.2 Search methods for identification of studies                                      | 14       |
| 3.2.1 Electronic searches                                                             | 14       |
| 3.2.2 Selection of search terms                                                       | 14       |
| 3.3.3 Searching other resources                                                       | 14       |
| 3.3 Data collection and analysis                                                      | 15       |
| 3.3.1 Selection of studies                                                            | 15       |
| 3.3.2 Data extraction and management                                                  | 16       |
| 3.3.3 Assessment of risk of bias of included studies                                  | 18       |
| 3.3.4 Measures of treatment effect                                                    | 20       |
| 3.3.5 Unit of analysis issues                                                         | 20       |
| 3.3.6 Dealing with missing data                                                       | 21       |
| 3.3.7 Assessment of heterogeneity                                                     | 21       |
| 3.3.8 Assessment of biases due to missing results                                     | 21       |
| 3.3.9 Data synthesis                                                                  | 22       |
| 3.3.10 Summary of findings tables and assessment of certainty of the body of evidence | 23       |

|                                                                           |           |
|---------------------------------------------------------------------------|-----------|
| <b>4. References</b>                                                      | <b>26</b> |
| Appendix 1: Database and register search strategies                       | 30        |
| Cochrane Central Register of Controlled Trials                            | 30        |
| MEDLINE via Ovid                                                          | 30        |
| Embase via Ovid                                                           | 30        |
| AMED via Ovid                                                             | 30        |
| Emcare via Ovid                                                           | 30        |
| CINAHL                                                                    | 30        |
| ClinicalTrials.gov and WHO ICTRP                                          | 31        |
| Google Scholar                                                            | 31        |
| Appendix 2: Study design features checklist                               | 32        |
| Appendix 3: TIDIER domains and example of application in Bowen therapy SR | 34        |

In April 2022 Cochrane Australia was contracted by the National Health and Medical Research Council (NHMRC) to design and undertake the systematic review described in this protocol. This systematic review is one of several independent contracted evidence evaluations being undertaken to update the evidence underpinning the 2015 *Review of the Australian Government Rebate on Natural Therapies for Private Health Insurance* (2015 Review) by the Department of Health and Aged Care (Department). The design and conduct of the review will be done in collaboration with the Office of NHMRC (ONHMRC), the NHMRC's Natural Therapies Working Committee (the Committee) and Department's Natural Therapies Review Expert Advisory Panel (NTREAP).

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### Declarations of interest

All authors declare they have no financial, personal or professional interests that could be construed to influence the conduct or results of this systematic review.

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## 1. Background

In 2015, the Australian Government conducted a *Review of the Australian Government Rebate on Natural Therapies for Private Health Insurance (2015 Review)*. Underpinned by systematic reviews of evidence for each natural therapy, one of the findings from the 2015 Review was that there was insufficient scientific evidence that Bowen therapy was effective. The National Health and Medical Research Council (NHMRC) has been engaged by the Department of Health and Aged Care (Department) to update the evidence underpinning the 2015 Review. This evidence evaluation of Bowen therapy is one of a suite of independent contracted systematic reviews that will inform the *Review of the Australian Government Rebate on Private Health Insurance for Natural Therapies 2019-20 (2019-20 Review)* [1].

Developed in Australia by Thomas Bowen in the 1950's, Bowen therapy (also known as Bowen, Bowen Technique, Bowenwork® or Bowtech®) is a non-invasive form of bodywork with a primary focus on the myofascia. Bowen therapy is used for a wide range of conditions and injuries in over 30 countries [2].

In Australia, the main source of information about the rates of consultation with complementary medicine practitioners is a cross-sectional survey conducted as part of the Practitioner Research and Collaborative Initiative (PRACI) [3]. The 2017 PRACI survey of Australian adults found that about a third of all respondents (36%; 726/2025 respondents) had consulted at least one complementary therapist in the last 12 months. Bowen therapy was not among the therapies examined, and data are lacking on the prevalence and frequency of consultation with teachers of the method or routine use.

### 1.1 Description of the intervention

In a Bowen therapy session, therapists use their thumbs and fingers to apply gentle rolling movements over muscle, ligament, tendon and other connective tissues according to each patient's presentation [4]. Each set of hand movements is interspersed with rest times of a few minutes to allow for integration and adaptation by muscles, fascia and nervous system. Adequate patient hydration before, during and after treatment is considered an important aspect of Bowen therapy [2].

#### **Mode of administration and dose**

Treatment can be received through a light layer of clothing, with sessions typically ranging from 30 minutes to one hour [5]. In the Bowen Workforce Survey 2012 undertaken by the Bowen Association of Australia (369 respondents), therapists reported that 60% of their patients receive one to three treatments for each presentation [6].

#### **Practitioners of Bowen therapy and regulation**

In Australia, Bowen therapy is delivered by a trained Bowen therapy practitioner. Bowen therapy training is provided by Bowen Training Australia [7], a Registered Training Organisation licensed by the Bowen Therapy Academy of Australia [8] to provide nationally recognised Bowtech® training at either Certificate IV or Diploma level, as well as continuing education workshops. Graduates of the Certificate IV course can register as full members of the Bowen Association of Australia (BAA), while graduates of the Diploma course register with BAA as accredited members. The BAA provides professional guidance and support for Australian Bowen therapists through its Code of Conduct and Code of Ethics, certifying that members have professional indemnity insurance, and administering continuing education units (CEUs) [9]. The Bowen Therapists Federation of Australia (BTFA) is the peak industry association that sets training and professional development standards for Bowen

therapists (minimum 500 hours clinical practice and Diploma-level qualifications) and Bowen practitioners (minimum 100 hours clinical practice and Certificate-level qualifications), and also provides membership services [10].

Bowen practitioners can also register with the Australian Traditional-Medicine Society (ATMS) if they fulfil the minimum requirements (at least Certificate IV level qualifications), adhere to the ATMS Code of Professional Ethics and Code of Conduct, and meet minimum annual continuing professional requirements [11]. The practice and teaching of the Bowen therapy is not regulated by the Australian Health Practitioner Regulation National Law [12].

## 1.2 How Bowen therapy might work

How Bowen therapy might work has to date been based on clinical observation. The Bowen Therapy Association Australia suggests that Bowen therapy promotes healing by stimulating the body's nervous, endocrine and connective tissue (fascial) systems [6]. It is theorised that specific sets of movements across the soft connective tissue stimulate the autonomic nervous system, central to the stable regulation of conditions within the body. It is thought these movements lead to a shift in dominance from the sympathetic system (governing stress, or 'fight-or-flight' responses) to the parasympathetic system (which regulates 'rest and digest' functions) [13, 14]. This is said by proponents to allow for the release of emotional and physical tension, bringing the whole body into balance [2, 13].

## 1.3 Description of conditions for which Bowen therapy is used

Bowen therapy is used as a treatment or as supportive care for many health conditions. An Australian survey of 47 practitioners with a qualification in Bowen therapy reported that the conditions most frequently reported as 'often' treated were: stress (84% of practitioners), neck pain (74%), sciatica (68%), headache/migraine (62%), knee pain (57%) and sports-related injury (46%), arthritis (42%), mental illness (depression/anxiety) (40%), insomnia/sleeping disorders (36%), foot problems (32%), diabetes (15%), cancer/oncology patients (10%), and palliative care (2%) [15]

Bowen Association Australia and Bowen Training Australia suggest Bowen therapy as a treatment for chronic conditions, mental distress, musculoskeletal conditions, respiratory conditions, migraine and headache, sports injuries, menstrual/hormonal issues and for support during pregnancy. Bowen is also recommended as a therapy to retain or increase flexibility and movement in older people [16, 17].

## 1.4 Why it is important to do this review

This systematic review will inform the Australian Government's Natural Therapies Review 2019-20, which is evaluating evidence of the clinical effectiveness of 16 therapies (including Bowen therapy). The conclusion from the evidence evaluation conducted on Bowen therapy for the 2015 Review was that "the included systematic reviews did not identify any evidence of sufficiently high quality to evaluate the effects of Bowen therapy" and therefore "[t]here is currently insufficient evidence from systematic reviews within this field to reach any conclusion regarding the effectiveness, safety, quality or cost-effectiveness of Bowen therapy" [18].

The 2015 evidence evaluation used overview methods to search for systematic reviews published between 2008 and 2013, identifying two systematic reviews. One of the systematic reviews identified 15 studies, however only one of these studies met the study design criteria for the overview, which was limited to results from randomised trials. This randomised trial was undertaken in a healthy population, and was therefore not eligible for consideration in the overview. The second systematic review searched for randomised trials or controlled studies investigating the effectiveness of CAM therapies for patients with cancer-related fatigue, however did not identify any studies of Bowen therapy in this population [18].

Since the completion of the original evidence evaluation, there have been additional published trials of Bowen therapy although the number of trials remains small. In contrast to the 2015 Bowen therapy evidence evaluation, this review will examine evidence from eligible primary studies published from database inception until the date of the last search for this systematic review.

## 2. Objectives

The overall objective of this systematic review is to examine the evidence for the clinical effectiveness of Bowen therapy in preventing and/or treating injury, disease, medical conditions or preclinical conditions [1]. The review will focus on outcomes (and underlying conditions) for which Bowen therapy is commonly sought or prescribed in Australia, and which are relevant to the 2019-20 Review of the Private Health Insurance rebate.

The specific objectives of the review follow (framed as questions). Examples of potentially relevant outcome domains and conditions are included to illustrate the breadth of questions to be addressed in the synthesis. These questions will be refined through a staged prioritisation process (Methods, Figure 1) to align with priorities for the 2019-20 Review, ensure a consistent approach across the evidence evaluations of natural therapies (where appropriate), and make best use of available evidence.

### Primary objectives

1. What is the effect of *Bowen therapy* compared to *no Bowen therapy (inactive controls)* (see section 3.1.3 Comparisons) among people with any condition, pre-condition, injury or risk factor on outcomes for which Bowen therapy is indicated? (for example, what is the effect on pain, physical function, anxiety or health-related quality of life irrespective of the underlying condition?)

### Secondary objectives

2. For each specified condition, pre-condition, injury or at-risk population, what is the effect of *Bowen therapy* compared to no Bowen therapy on outcomes for which Bowen therapy is indicated? (For example, what is the effect on pain among people with chronic musculoskeletal pain, or headache and migraine?)
3. What are the effects of *Bowen therapy* compared to *evidence-based 'gold standard' treatments*? (see 3.1.3 Types of interventions - Comparisons)
4. What evidence exists examining the effects of *Bowen therapy* compared to other active comparators? (i.e. not a 'gold standard')

## 3. Methods

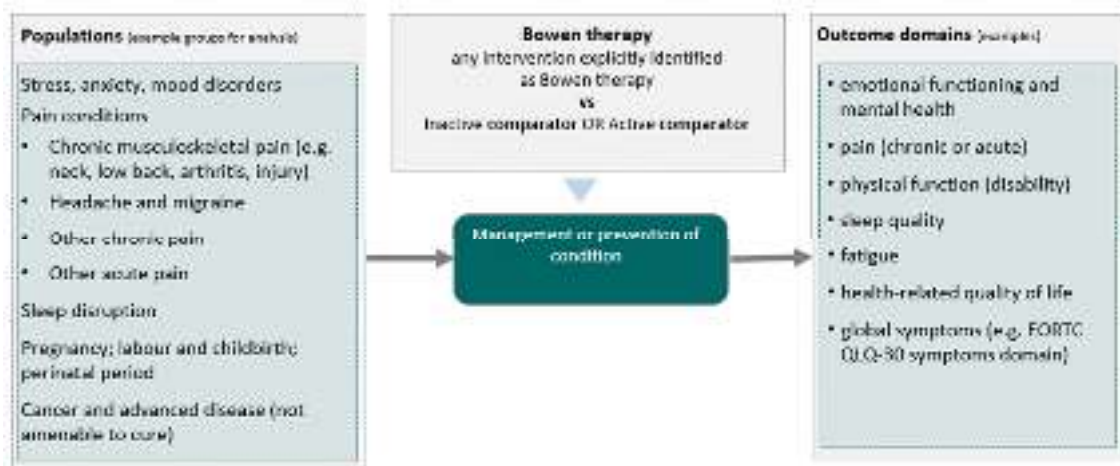
Methods reported in this protocol are based on the *Cochrane Handbook for Systematic Reviews of Interventions* [19]. The GRADE approach will be used to summarise and assess the certainty of evidence arising from this review (see Section 3.3.9 for details). GRADE methods are widely used in systematic reviews and guideline development to ensure a systematic, transparent and common approach to interpreting results [20]. The protocol is reported in accordance with the PRISMA-P statement [21, 22] with consideration given to the extensively updated guidance for reporting methods for systematic review in the PRISMA 2020 statement [23, 24]. The review has been prospectively registered on the International prospective register of systematic reviews (PROSPERO ID CRD42023467144). Any changes to the protocol (including methods not used) will be documented when reporting the methods of the completed review.

The methods for this review are designed to accommodate the breadth of evidence about the effects of the Bowen therapy relevant to the 2019-20 Review, and ensure a consistent approach with the other evidence evaluations of natural therapies (where appropriate). To achieve this, we will follow the staged approach summarised in **Figure 1** and elaborated in subsequent sections. We begin with an initial analytic framework (step 1) that will be refined through a prioritisation process. To facilitate this process, we will screen studies against the review eligibility criteria and compile an aggregate list of outcomes for each population group, derived from the included studies and organised by the initial framework (step 2). No identifying information will be included (i.e. no study-level information, results, references, number of studies etc). The NTWC and NTREAP will review the list in order to prioritise outcomes and advise on the final framework for the synthesis (step 3), which will be finalised (step 4) prior to proceeding with the review (step 5).



**Figure 1.** Staged approach for developing the analytic framework for this review

**Figure 2** shows the initial analytic framework for the review. Example populations and outcome domains are included to convey the breadth of the review, and illustrate possible population and outcome groups for synthesis. These are indicative and not intended to be exhaustive. The framework was informed by research on the outcomes (and underlying conditions) for which Bowen therapy is commonly sought or prescribed, a scoping search of studies evaluating Bowen therapy, the wider literature on Bowen therapy, and consideration of frameworks for classifying disease and outcomes [25, 26]. Details for each PICO (population, intervention, comparator, outcomes) element follow (Section 3.1).



**Figure 2.** Initial analytic framework for the review and synthesis

### 3.1 Criteria for considering studies for this review

### 3.1.1 Types of studies

Randomised controlled trials (RCTs) and non-randomised studies of interventions (NRSIs) are eligible for inclusion in the review.

*Randomised controlled trials* including individually and cluster randomised, and cross-over trials are eligible for inclusion in the review.

Controlled trials in which the allocation sequence does not include a truly random element, was predictable, or was not adequately concealed from investigators, will be considered alongside RCTs when assessing risk of bias (i.e. using the Cochrane ROB 2 tool) and in the synthesis as long as there was an attempt to have some kind of ‘randomisation’ to groups. These studies are sometimes referred to as ‘quasi-random’. Examples include studies using methods for sequence generation based on alternation, dates (of birth or admission) and patient record numbers [27]. This is to ensure a consistent approach with other natural therapies systematic reviews.

*Non-randomised studies of interventions (NRSIs)* with specific design features are eligible for inclusion in the review. In line with current Cochrane guidance, only NRSIs with design features that are suitable for estimating a causal effect will be eligible. While study design labels will be used as an aid to communicating about eligible designs and for use in the review (Table 1), eligibility decisions will be based on assessment of the specific design features of each study rather than the label used by the study authors (see checklist Appendix 2) [28, 29].

Eligible designs are those in which the following features are present.

- The intervention may be allocated to individuals or clusters. We anticipate that Bowen therapy (or the control) will be allocated to individuals in most studies, although clustering is likely in these studies given the way in which Bowen therapy lessons are delivered (i.e. the same teacher may deliver the intervention to multiple participants) [30].
- Treatment groups may be formed by some action of the researchers or in the course of usual treatment decisions (including healthcare decision makers, practitioners or participants/patients/peoples’ choices).
- Studies must include a contemporaneous control.
- There must be an attempt to control for confounding (either by using methods that control in principle for confounding or that control for observed covariates)
- The design must be suitable for estimating a causal effect.

**Table 1. Study design labels to be used in the review with indicative features**

| Study design label                    | Thumbnail sketch of indicative features (extracts from [29, 31])                                                                                                                                                                                                                                                                           |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nonrandomised controlled trial (NRCT) | Study in which allocation to intervention and comparator is not random or quasi-random (including where based on the practitioners’ or participants’ preferences) and is applied by research personnel. Participants are followed up from the start of intervention up to a later time for ascertainment of outcomes of interest [29, 31]. |
| Prospective cohort study (PCS)        | Study in which subjects are identified prospectively and classified as having received the intervention or comparator of interest on the basis of the prospectively collected information. Participants are followed up from the                                                                                                           |

|                                           |                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           | start of intervention up to a later time for ascertainment of outcomes of interest [29, 31].                                                                                                                                                                                                                                                                                    |
| Retrospective cohort study (RCS)          | Study in which subjects are identified from historic records and classified as having received the intervention or comparator of interest on the basis of the historic information. Participants are followed up from the start of intervention up to a later time for ascertainment of outcomes of interest [29, 31].                                                          |
| Controlled Interrupted time series (CITS) | Studies that “collect longitudinal data measured at an aggregate level (across participants within one or more units), with several measurement times before implementation of the intervention, and several measurement times after implementation of the intervention.” [31] Must have a contemporaneous control in which the intervention is not implemented to be eligible. |
| Controlled before-and after-study (CBA)   | “Studies in which: (i) units are non-randomly allocated to a group that receives an intervention or to an alternative group that receives nothing or a comparator intervention; and (ii) at least one measurement of the outcome variable is made in both groups before and after implementation of the intervention...” [31]                                                   |

**Exclusions.** Historical case control (no contemporaneous control), uncontrolled before-after studies (no contemporaneous control), and cross-sectional studies (not suitable for establishing a causal effect because both the outcome and exposure to the intervention are measured at the same time). Case-control studies are also ineligible because they are only suited to examining rare outcomes (which are unlikely to be among the core outcomes for the conditions for which the Bowen therapy is used) and harms (which are outside the scope of this review).

#### **Date and language restrictions.**

There are no restrictions on publication date.

Potentially eligible studies published in languages other than English will not be included in the review, but will be listed according to whether they are likely to be eligible or whether eligibility cannot be determined (see 3.3.1 Selection of studies). The impact of excluding these studies will be considered in the assessment of bias due to missing results (see 3.3.8 Assessment of reporting bias, 3.3.9 Summary of findings tables and assessment of the certainty of the body of evidence).

#### **3.1.2 Types of participants**

Studies involving participants with any disease, medical condition, injury, or preclinical condition are eligible for the review. This includes healthy participants with clearly-identified risk factors (e.g. biomedical, health behaviours, or other). There are no restrictions on age or other demographic factors.

For trials in which the Bowen therapy is used for primary or secondary prevention, participants must have a clearly-identified factor that puts them at heightened risk of the condition or injury that the intervention is intended to prevent compared to the population at large. Where possible, decisions about whether a population is at risk will be informed by evidence from a systematic review of risk factors.

We will operationalise this as follows:

Bowen therapy for any health condition: protocol for a systematic review (PROSPERO ID. CRD42023467144)

- The risk factor(s) for the condition that Bowen therapy is used to prevent must be part of the eligibility criteria for the trial or reported in the baseline data (e.g. work that involves demanding posture or repetitive movement in a trial aiming to prevent workplace-related musculoskeletal pain; a trial aiming to prevent workplace-related anxiety, and where eligible participants are those that report symptoms of burnout at baseline), and
- There must be a direct link between the risk factor and the trial outcomes (i.e. an outcome that demonstrates progression to a diagnosable condition or pre-condition; musculoskeletal pain or injury in a trial that aims to prevent injury)

We expect that studies will include participants that fall within broad population groups, such as those shown in **Figure 2**. These are indicative groups, included to illustrate the breadth of populations eligible for the review and possible groupings for synthesis. Decisions about which groups to include in the final analytic framework will be made through the prioritisation process (**Figure 1**). This process may lead to changes and additions to the population groups (i.e. broader, narrower or new groups).

**Exclusions.** Healthy populations seeking health improvement. This includes healthy participants using Bowen therapy to enhance general well-being. For borderline decisions, the NTWC will be given the study PICO, aims and any information about potential risk factors reported by the trialists (without results or information that identifies the study) and asked to adjudicate.

Studies that include both healthy participants and participants eligible for the review, will be included if separate data are available or a majority of participants meet the review eligibility criteria as per guidance in the Cochrane handbook [32]. For the latter, we will consider implications for the applicability of study findings in the GRADE assessment.

While studies involving any population will be included in the review (except for the specific exclusions above), if the number of eligible studies for synthesis is unmanageable, the synthesis may be limited to populations (conditions) most relevant to the use of the Bowen therapy in Australia. Such decisions will be made through a similar process to that outlined in Figure 1, by the NTWC without knowledge of study results or other identifying information. The decisions will be guided by data about practice in the Australian context (e.g. practitioner or patient surveys that report reasons for use in Australia). Studies excluded from the synthesis to limit scope will be included in an evidence inventory (Objective 5).

### 3.1.3 Types of interventions

For the purpose of this review, Bowen therapy is defined as “a remedial hands-on technique based on the use of gentle pressure and release of the soft connective tissue (fascia) of the body” [excerpt from [33]].

Because of the potential challenge of distinguishing Bowen therapy from related modalities, such as connective tissue manipulation (CTM), and the likelihood of identifying studies in which the defining techniques and principles of the Bowen therapy are incompletely reported, studies will be included if the therapy is described as Bowen therapy (or other synonyms). Studies that fail to mention or describe the intervention as Bowen therapy (or other synonyms) will be excluded.

Except for the specific exclusions below, Bowen therapy interventions will be eligible irrespective of the training or qualifications of the practitioner, the setting in which Bowen therapy is used, and the dose and duration of treatment. More details about each of these intervention features is considered in Section 3.3.2 Data extraction and Appendix 3.

### Comparisons

1. Bowen therapy *versus* any inactive comparator (placebo/sham, no intervention, wait list control, usual care).
2. Bowen therapy *versus* evidence-based gold standard treatment(s) (see below for selection method)
3. Bowen therapy *versus* other active comparators (for inclusion in evidence inventory only, not the synthesis – See below)

Comparisons 1 and 2 will be addressed in separate syntheses (meta-analyses). Each synthesis will address a broad outcome domain with studies grouped within by population group (where appropriate; see Figure 2 for examples). Where a study includes multiple arms, with at least one eligible comparator (e.g. a placebo control arm), we will include the eligible comparison(s). Co-interventions are eligible providing the same co-intervention is in both arms of the comparison.

For comparison 2, evidence-based gold standard treatments will be identified through the prioritisation process (Figure 1, step 3). We will provide the NTWC and NTREAP with a list of active comparators identified from included studies (step 2). Studies with active comparators will not contribute to the synthesis except in the exceptional circumstance where the NTWC considers that the comparator intervention is an accepted, evidence-based ‘gold standard’ of care for the population in the studies, and there are studies suitable for conducting a synthesis (meta-analysis) (i.e. comparable PICO criteria, low risk of bias). These judgements will be made blinded to the studies and study results, to the fullest extent possible. For studies involving other active comparators, we will provide an inventory of available evidence, tabulating a brief description of the characteristics of the Population, Intervention, Comparator, and Outcomes (PICO) for each study.

**Exclusions.** In line with the main review objective, which is to examine the effects of the Bowen therapy rather than the comparative effects of different implementations of the Bowen therapy, we will exclude head-to-head comparisons of the Bowen therapy from the review (see exceptions below). For example, we will exclude studies where the only comparator is:

- a different dose (frequency, duration, schedule or combination thereof) of the same Bowen therapy methodology (e.g. different numbers of sessions)
- where the person administering Bowen therapy has a different qualification, or level of experience (e.g. Bowen therapist versus other health professional),
- or combinations of the above.

### 3.1.4 Types of outcomes

Any study that measures a health outcome will be eligible for the review, however the synthesis will be limited to outcomes of importance for decision-makers as identified through the process in Figure 1 and detailed below. Outcomes eligible for this review are those that align with the reasons why the Bowen therapy is sought by patients and prescribed by practitioners. In principle, this may include any patient-important outcome that helps elucidate the effects of the Bowen therapy on an underlying condition or its symptoms, recovery, rehabilitation, or prevention of disease among people with specific risk factors or pre-conditions.

Example outcome domains are shown in Figure 2. The example outcome domains are intended to illustrate the breadth of outcomes likely to be important for understanding the effects of Bowen therapy across conditions, as identified from the background literature on the Bowen therapy.

The grouping of related outcomes within each domain (Figure 2) is based on ICD11 codes and the COMET outcome taxonomy[25, 26]. These systems provide a widely agreed and understood structure for categorising different outcomes

*Prioritisation and selection of outcomes for summary and synthesis*

**Outcome prioritisation.** To accommodate the breadth of relevant outcomes, the outcome domains and population-specific outcomes for inclusion in the synthesis will be determined through the prioritisation process (Figure 1).

To prioritise the most important outcomes for this review:

- We will compile a list of specific outcomes from included studies and example outcome measures (without results or identification of studies).
- Outcomes in the list will be categorised by the outcome domains and population groups in Figure 2. Outcomes that fall outside the proposed outcome domain will also be listed.
- The NTWC will be asked to indicate whether each of the listed outcome domains (or specific outcomes) is critical, important or of limited importance for understanding the effects of the Bowen therapy on each population group. Only critical and important outcomes will be considered in the review.

**Outcome selection.** From each study, we will select only one outcome per outcome domain for data extraction (results), risk of bias assessment and inclusion in the summary and synthesis. The exception is for timeframe of measurement (see below).

For each outcome domain, we anticipate that there may be considerable multiplicity of results arising as follows.

- (1) Across studies, both the specific outcomes and methods used to measure each outcome will vary.
- (2) Within studies, results may be reported for multiple outcomes within a domain (e.g. pain intensity overall, pain on walking), multiple measures (e.g. visual analogue scale; overall and subscale scores from the Western Ontario and McMaster Universities Osteoarthritis Index), at multiple timepoint, or combinations of all three.

We will address this by using the following approach to select one outcome per domain from each study and by using the standardised mean difference (SMD) to quantify the effects of the Bowen therapy. Using the SMD enables results to be combined for meta-analysis irrespective of the measure used, thus ensuring that any study that reports an outcome within a domain can be included in the analysis (see 3.3.9).

- An initial hierarchy of population-specific outcomes and measures will be presented to the NTWC for discussion and approval (e.g., a hierarchy of pain outcomes and measures for osteoarthritis).
- Where possible, the initial hierarchy will be based on outcome hierarchies used in published Cochrane reviews, systematic reviews of measures that provide evidence of the relevance and validity of measures, and core outcome sets.
- We will also seek advice on the most relevant time point for outcome measurement. This is likely to be at the end of the intervention period.

- We will follow the agreed hierarchy of population-specific outcomes measures and timepoints to select the most relevant and valid measure of each outcome domain available from each study for inclusion in the synthesis.

Exclusions:

- experience of care (e.g., satisfaction),
- safety,
- quality, and
- economic outcomes.

Studies will not be excluded from the review based on outcome, except where it is possible to confirm unequivocally (e.g., from a registry record or a priori protocol) that the study only measured experience of care, safety, quality, or economic outcomes.

## 3.2 Search methods for identification of studies

### 3.2.1 Electronic searches

We will conduct searches of the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE (via PubMed), Embase, Emcare, AMED, CINAHL and Europe PMC (for preprints). Details of completed or ongoing studies will be sought from ClinicalTrials.gov and the WHO International Clinical Trials Registry Platform. Searches will not be limited by date, language, or format of publication.

### 3.2.2 Selection of search terms

Bowen therapy is a subject heading in Embase and Emcare but not the other databases. In MEDLINE, Bowen Therapy does not automatically translate to other MeSH terms since it is not listed as an entry term.

We investigated potential MeSH terms by looking at a sample of 13 MEDLINE records with Bowen therapy or Bowen technique in the title. This revealed a lack of appropriate terms applied to this intervention. The two most common MeSH terms were Massage and Musculoskeletal Manipulations. However, these terms capture a much broader scope of interventions than just Bowen therapy, and when combined with the randomised trial filter, retrieve over 4000 records. Hence our MEDLINE search does not contain any MeSH terms.

We looked at the one systematic review of Bowen therapy [2], as well as its included studies, to identify potential search terms or combinations of terms. Bowen therapy is referred to in several ways in the literature, including Bowen technique, Bowenwork® and Bowtech®; this is reflected in our single line textword search that uses a proximity operator. The search is designed to avoid retrieving records relevant to Bowen's Disease and Bowen's Family Systems Theory.

Given the relatively small number of records we are likely to retrieve (~200) we decided not to include study design terms in any of the search strategies. (See Appendix 1 for proposed search strategies.)

Our rationale for only selecting terms specifically related to Bowen therapy (or its variants) is that research studies conducted to evaluate this therapy will use the term Bowen in the title and/or abstract of the record rather than non-specific or generic descriptions of techniques that may or may not be classified as Bowen therapy.

### 3.3.3 Searching other resources

The 2015 overview of Bowen therapy only identified one systematic review that included any relevant studies. The one RCT and 2 quasi-experimental studies from this review will be added to the records

we screen. We will also look at studies included in any systematic reviews of Bowen therapy published since 2014 that our searches identify.

We will screen studies provided by the public and key stakeholders (via Department of Health and Aged Care), NTREAP and NTWC for eligibility. Where these groups recommend particular systematic reviews, we will examine the references to identify potentially eligible studies.

We will examine the reference lists of all included studies to identify additional trials or studies, and conduct forwards citation searching (i.e. looking for studies that have cited included studies) using Citation Chaser (<https://estech.shinyapps.io/citationchaser/>).

We plan to search Google Scholar using the terms "bowen therapy", "bowen technique", "bowen treatment", "bowen practice", bowenwork, and bowtech.

For studies included in the review, we will conduct supplementary searches to check whether any are listed as fraudulent or retracted, or have errata and comments associated with them. This will involve retrieving the PubMed record linked to each study and checking for the following Publication Types: Retracted Publication, Retraction of Publication, Expression of Concern, Published Erratum, and Comment. For reports of studies not indexed in PubMed, we will check the source database. We will also search the Retraction Watch Database (<http://retractiondatabase.org/>) using the term bowen. As appropriate, we will consult Chapter 4 (section 4.4.6) of the Cochrane Handbook and section 3.9 of Technical Supplement for additional guidance.

### 3.3 Data collection and analysis

#### 3.3.1 Selection of studies

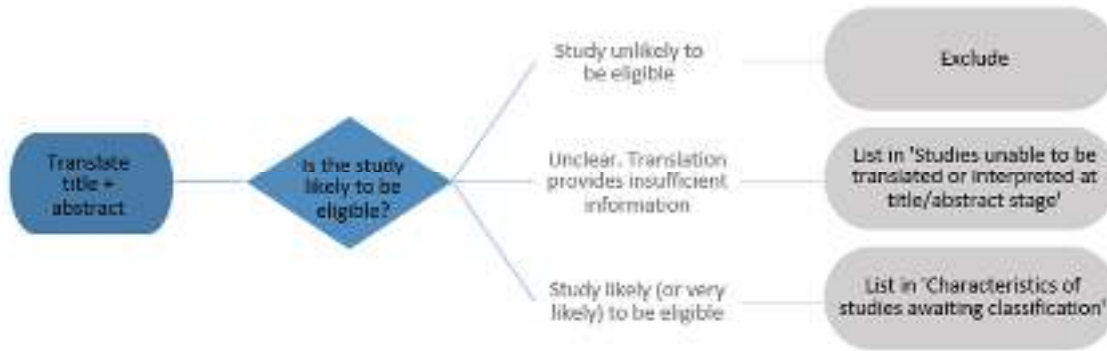
Records from the database and register searches will be imported into EndNote and duplicates removed. All remaining records will be imported into Covidence for screening. Records submitted through the Department, NTREAP or the Committee will be screened to confirm that the type of study is eligible, then non-duplicate records will be imported into Covidence for screening alongside other studies.

We will pilot guidance for title and abstract screening on a sample of 50 records to ensure the eligibility criteria are being applied consistently by three reviewers (SB, MM, SM). If needed, we will amend the screening guidance (but not the eligibility criteria) to enhance consistency. All records at title and abstract stage will be independently screened by at least two reviewers. All records selected for full-text screening will be reviewed independently by two reviewers. Disagreements at either stage of screening will be resolved by consensus among members of the review team. Where disagreement cannot be resolved, advice will be sought from the NTWC (which will be provided with PICO characteristics for the de-identified study).

Studies confirmed as meeting the eligibility criteria, but for which results are not available in a published report, will be included in a list of 'ongoing studies'.

The following will be included in a list of 'studies awaiting classification'.

- Studies that are only published as abstracts or for which a full report is not available (i.e. we will not seek further information from study authors to confirm eligibility).
- Studies identified by, or submitted to, the review team after the date of the last search.
- Studies confirmed as likely to be eligible, but for which no English language translation of the full-text publication is available. Studies for which eligibility cannot be confirmed following translation of the title and abstract using Google translate, will be listed separately (Figure 3).



**Figure 3.** Flowchart showing handling of studies in languages other than English (reproduced from NHMRC framework for natural therapies systematic reviews [34]).

Studies that do not meet the eligibility criteria will be excluded and the reason for exclusion will be recorded at full-text screening. These studies will be included in a ‘Characteristics of excluded studies’ table in which the reason for exclusion is reported.

The search and study selection steps will be summarised in a PRISMA flow diagram.

For studies that originated from the call for evidence, NTREAP, or the Committee, we will record and report exclusion decisions irrespective of whether the study was excluded during title and abstract screening or full text review. We will document the flow of these studies through the review in the PRISMA flow chart and annotate tables with the source.

### Dealing with duplicate and companion publications

Multiple publications to the same study (e.g. protocols, trial registry entries, trial reports) will be identified and linked using Excel prior to the data extraction stage. Each study will be given a unique identifier and all linked records cited in the final report. Records will be matched using trial registry numbers. Where these are not available, we will consider author names, trial name, trial location(s) and number of participants.

### 3.3.2 Data extraction and management

Three authors (MM, SB or SM) will pre-test the data extraction and coding form on 3-5 studies (as needed to achieve consistent coding) using REDCap electronic data capture tools hosted at Monash University [35, 36]. These studies will be purposefully selected from the included studies to cover the diversity of data types anticipated in the review. One author (SB) will review the extracted and coded pilot data for completeness, accuracy and consistency. Where needed, advice will be sought from a clinical advisor and biostatistician (JM) to ensure data are extracted as planned. Revisions to the data extraction form and guidance will be made as required to maximise the quality and consistency of data collection.

For each included study, one review author (MM, SB, or SM) will extract study characteristics and quantitative data using a pre-tested data extraction and coding form, with a 10% random sample extracted by a second author (with further sampling if needed until 80% agreement is achieved). For studies extracted by a single author, a second author (MM, SB, or SM) will independently verify the quantitative data. Discrepancies will be resolved through discussion, and advice sought from a third reviewer, the biostatistician (JM), if agreement cannot be reached or for more complex scenarios. NTWC will be asked to adjudicate on borderline decisions (e.g. whether an otherwise healthy population has ‘risk factors’).

We will extract information relating to the characteristics of included studies and results as follows.

#### 1. Study identifiers and characteristics of the study design

- Study references (multiple publications arising from the same study will be matched to an index reference; code as index paper, protocol, registry entry, results paper 1, 2, ...)
- Study name, location, commencement date, and trial registration number
- Study design (categorised as randomised trial ['individually randomised', 'cluster randomised', 'cross-over', or 'other'] or non-randomised study of intervention ['non-randomised controlled trial', 'prospective cohort study', 'retrospective cohort study', 'controlled interrupted time series study', or 'controlled before-after study']).
- Funding sources and funder involvement in study.
- Financial and non-financial interests declared by investigators.

#### 2. Study design

- Study design label: coded according to the design identified after applying the checklist of design features (Appendix 2)
- Detailed coding of design features of each study using the checklist of design features (Appendix 2)

#### 3. Characteristics of each intervention group (including comparator groups)

- Characteristics of the intervention structured by domains of the Template for Intervention Description and Replication (TIDIER) checklist [37] (see Appendix 3 for TIDIER domains, codes and an example of coding for Bowen therapy).
- Number of participants: randomised to each group, at follow up for selected outcome, and included in analysis and reasons for loss to follow-up
- For NRSIs, details of the methods used to collect information on the intervention allocated or received by each participant (i.e. the information used to classify intervention status)

#### 4. Characteristics of participants

- Participant eligibility criteria (verbatim or precis)
- Age (mean, range)
- Sex
- Population group: coded using categories specified in the final analytic framework for the review (e.g. stress, anxiety and mood disorders, chronic musculoskeletal pain (low back pain/neck pain/arthritis), headache, migraine, other chronic pain, pregnancy, labour and childbirth)
- Condition: specific underlying condition as described in study (e.g. asthma, depression), ICD11 code, information about severity (if relevant)
- Other characteristics of importance within the context of each study

#### 5. Outcomes assessed and results

Bowen therapy for any health condition: protocol for a systematic review (PROSPERO ID. CRD42023467144)

- Outcomes measured (a list of all outcomes, categorised according to the broad domains specified in the final analytic framework for the review, or as ‘other’ if none of the outcome domains apply)
- For outcomes selected for inclusion in the summary and synthesis of results:
  - Outcome domain: categorised according to the broad domains specified in the final analytic framework for the review (e.g. pain, physical function (disability), sleep, health-related quality of life, emotional functioning / mental health, global symptoms)
  - Outcome as described in the included study (verbatim or precis)
  - Measurement method (e.g. Asthma Control Questionnaire (ACQ) or Asthma Control Test (ACT)), information required to interpret measures (scale range and direction, minimally important difference) and time point (exact, and time-frame categorised as ‘immediate’ or ‘longest follow-up’)
  - Results including: summary statistics by group (means and standard deviations, or number of events for cognitive outcomes that have been dichotomised, and sample size), estimates of intervention effect (e.g. mean differences (or adjusted mean differences for NRSIs), confidence intervals, t-values, p-values, or risk ratios/odds ratios for binary outcomes). For adjusted estimates, we will extract information on the analysis method, how confounding was adjusted, and which confounders were adjusted for (applies primarily to NRSIs).
  - Data required to support risk of bias judgements (see Section 3.3.3) [27, 38-40]

### 3.3.3 Assessment of risk of bias of included studies

#### Assessment of risk of bias in RCTs

We will assess the risk of bias in included studies using the revised Cochrane ‘Risk of bias’ tool (RoB 2) for randomised trials [27, 40] or the ROBINS-I tool for non-randomised studies of interventions [31, 38, 39]. The assessment will be made for each critical (or important) outcome included in the synthesis. Our assessment will be based on the effect of assignment to the intervention.

RoB 2 addresses five domains:

1. bias arising from the randomisation process;
2. bias due to deviations from intended interventions;
3. bias due to missing outcome data;
4. bias in measurement of the outcome;
5. bias in selection of the reported result.

For cluster trials and cross-over trials, we will use the variants of the RoB 2 tool specific for each design [27, 30]. Non-randomised clinical trials that do not include the study design features that we have specified for a ‘randomised’ trial will be assessed with ROBINS-I.

ROBINS-I addresses seven domains:

1. bias due to confounding

2. bias in selection of participants into the study
3. bias in classification of interventions
4. bias due to deviations from the intended intervention
5. bias due to missing data
6. bias in measurement of outcomes
7. bias in the selection of the reported result

In assessing risk of bias due to confounding (domain 1), we will answer the optional question about the predicted direction of bias (to determine whether residual confounding favours the control, thus lessening concerns that any observed beneficial effects are due to bias). In our overall judgement for domains 1 and 2, we will consider whether large effects or a dose response mitigate concerns about bias due to confounding or selection of participants into the study [39, 41].

To promote concordance, the assessment will be piloted by three review authors (MM, SB, SMc) on 3-5 studies until consistent judgments are achieved across a range of scenarios. One review author (MM, SB or SMc) will then apply the tool to the selected results from each study following the RoB 2 or ROBINS-I guidance [27, 39], and a second author will verify the assessments (SB or SMc). Supporting information and justifications for judgements for each domain (i.e. for ROB 2: low, some concerns, high risk of bias; for ROBINS-I: low, moderate, serious, critical risk of bias) will be recorded. We will derive an overall summary of the risk of bias from each assessment, following the algorithm in the RoB 2 guidance [27] and in a forthcoming revision of guidance to ROBINS-I. Disagreement between review authors will be resolved through discussion, and a third review author (SB, SM or JM) will adjudicate where agreement cannot be reached.

For NRSIs, if we judge a result to be at “critical” risk of bias on the first domain (bias due to confounding), we will not assess other domains, since the overall risk of bias for the result would be “critical” by default. Results judged to be at “critical” risk of bias overall will be excluded from the summary and syntheses of results, and will not contribute to our conclusions.

***Selection of effects for ROB assessment and synthesis.*** When multiple effects of the intervention using different approaches are presented in a study report, we will select one effect for inclusion in the meta-analysis and for RoB assessments. For randomised trials, the selected effect will be chosen according to the following hierarchy, which orders the approaches from (likely) least to most biased for estimating the *effect of assignment to the intervention*: 1. the effect that corresponds to a full intention-to-treat analysis, where missing data have been multiply imputed, or a model-based approach has been used (e.g. likelihood-based analysis, inverse-probability weighting); 2. the effect corresponding to an analysis that adheres to intention-to-treat principles except that the missing outcome data are excluded; 3. the effect that corresponds to a full intention-to-treat analysis, where missing data have been imputed using methods that treat the imputed data as if they were observed (e.g. last observation carried forward, mean imputation, regression imputation, stochastic imputation); or 4. the effect that corresponds to an 'as-treated' or 'per-protocol' analysis, or an analysis from which eligible trial participants are excluded [27, 40]. For NRSIs, the selected effect will be the estimate adjusted for critical confounding domains.

### **Pre-specification of confounding factors and co-exposures**

Confounding domains are “prognostic variables (factors that predict the outcome of interest)” that also predict whether an individual receives one or the other interventions of interest [31]. ROBINS-I defines important confounding domains as those “for which, in the context of [a specific] study,

adjustment is expected to lead to a clinically important change in the estimated effect of the [exposure]”. It is recommended that users applying ROBINS-I should consider in advance the confounding factors and co-interventions that have the potential to lead to bias in included studies. Due to the diversity of conditions and outcomes eligible for this review, confounding domains and co-exposures will be identified after the prioritisation process (Figure 1) but prior to assessment of studies.

### 3.3.4 Measures of treatment effect

We anticipate that many of the outcomes will be continuous (e.g. pain, physical function), and that varying measurement instruments will be used to measure the same underlying construct across the studies. For this reason, we will quantify the effects of Bowen therapy using the standardised mean difference (SMD) (implementing the Hedges’ adjusted  $g$  version). In trials where a continuous measure has been dichotomised (e.g. a continuous pain scale is dichotomised into improvement or no improvement) and analysed as binary outcomes, we will re-express reported, or calculated, odds ratios as SMDs [42]. For dichotomous (e.g. experienced a fall), count (e.g. number of falls in a period of time) and time-to-event (e.g. time to first fall) outcomes, we will quantify the effects of Bowen therapy using risk ratios (RR), rate ratios, and hazard ratios, respectively, where possible.

**Thresholds for interpreting the effects.** Following the GRADE minimally contextualised approach for interpreting findings, all interpretations will be based on where the combined estimate of effect (point estimate) lies in relation to a pre-specified threshold for an important effect (i.e. whether an important effect is observed or not) and the direction of effect (beneficial or harmful) [43]. Given the wide range of conditions, outcomes and measurement methods expected in this review, it is not possible to specify thresholds for interpreting the size of effect for each outcome measure. We, therefore, plan to use Cohen’s guiding rules for interpreting SMDs (0.2 represents a small effect, 0.5 a moderate effect, and 0.8 a large effect) [44]. In practice, our interpretation will be based on whether there was an important effect or not [43, 45, 46], with an SMD of 0.2 standard units set as the threshold for an important difference. If the SMD falls within the prespecified range of -0.2 to 0.2 (i.e. within both thresholds), the effect of Bowen Therapy will be considered to be no different from control. An SMD above 0.2 or below -0.2 will be interpreted as an important effect. Where a valid and reliable minimal important difference (MID) is available for a familiar and commonly used measure of relevance to the population groups in the meta-analysis, we will re-express the SMD in units of the measure and interpret the effect in relation to the MID if feasible to do so [44]. For dichotomous outcomes, we will use a relative risk increase of 25% (or above) and a relative risk reduction of 20% as the thresholds for an important effect. We will also express relative effects in absolute terms, and consider whether the absolute risk difference with intervention still indicates an important effect, seeking advice from the NTWC if decisions are borderline.

### 3.3.5 Unit of analysis issues

In this review, unit of analysis issues may arise from non-standard designs (cluster trials, cross-over trials) or from trials with more than two eligible intervention groups. In the following we outline the methods for making adjustments when necessary. Any adjustments will be documented (e.g. assumed intra-cluster correlation and average cluster size). We will also report when necessary adjustments were unable to be made due to missing information.

For cluster randomised trials that have not appropriately accounted for correlation in observations within clusters, we will attempt a re-analysis. We will do this by inflating the variance of the intervention estimates by a design effect (DEFF). The DEFF is calculated from two quantities – an intra-cluster correlation (ICC) and the average cluster size. Estimates of ICC will be imputed from other cluster trials included in the review, where possible, or by using external estimates from empirical

research (e.g. Bell 2013 [47]). The average cluster size will be calculated from reported information in the trial.

For cross-over trials where an appropriate paired analysis is not available, we will attempt to approximate a paired analysis by imputing missing statistics (e.g. correlation). Estimates of the missing statistics will be imputed from other cross-over trials included in the review, where possible, or by using external estimates from empirical research (e.g. Balk 2012 [48]).

For trials where more than one comparison from the same trial is eligible for inclusion in the same meta-analysis (e.g. instructors with different training in the Bowen therapy; different numbers of lessons), we will combine intervention groups, where it makes sense to do so; otherwise, we will appropriately reduce the sample size so that the same participants do not contribute more than once.

### **3.3.6 Dealing with missing data**

We will not contact trial authors to obtain missing information (e.g. study characteristics, description of conduct of the study) or aggregate level statistics (e.g. missing standard deviations). However, we will attempt to calculate statistics necessary for meta-analysis using algebraic manipulation of reported statistics (e.g. computing the standard error for the treatment effect from a reported p-value). When standard deviations cannot be calculated from available statistics, but interquartile ranges or ranges are reported, we will use the formula in Wan et al [49] to estimate approximate standard deviations. When neither of the above methods are possible, we will impute the standard deviation using the average standard deviation across trials included in the same meta-analysis that have used the same measurement tool. When means are missing, but medians are reported, we will use the formula in Wan et al [49] to estimate approximate means.

Our approach for dealing with missing outcome data within the primary trials will be through sensitivity analyses, where trials judged to be at a high or unclear risk of bias will be excluded (Section 3.3.9 Data synthesis). Risk of bias 'due to missing outcome data' is considered within the overall bias judgement for a trial. A similar approach will be taken with NRSI, excluding studies judged to be at serious risk of bias.

### **3.3.7 Assessment of heterogeneity**

We will assess statistical heterogeneity of the intervention effects visually by inspecting the overlap of confidence intervals on the forest plots, formally test for heterogeneity using the  $\chi^2$  test (using a significance level of  $\alpha=0.1$ ), and quantify heterogeneity using the  $I^2$  statistic [50].

### **3.3.8 Assessment of biases due to missing results**

We will use a framework for assessing risk of bias due to missing results in which an assessment is made for each meta-analysis regarding the risk and potential impact of missing results from studies (termed 'known-unknowns') and the risk of missing studies (termed 'unknown-unknowns') [51]. We will use this framework to guide our assessments of whether there is 'undetected' or 'suspected' reporting bias for each of the comparisons in our GRADE assessment (Section 3.3.10 Summary of findings tables and assessment of certainty of the body of evidence).

In assessing 'known-unknowns', we will determine what studies meeting the inclusion criteria for the particular meta-analysis have missing results through examination of the publication's methods section, trial registry entry (if available), and trial or study protocol (if available). We will make an assessment as to whether the missing result was potentially due the result itself (e.g. 'not statistically significant'), and whether inclusion of the result could lead to a notable change in the meta-analysis (e.g. if the missing result is from a large trial). We will also assess the impact of missing results from studies reported in languages other than English that were judged as being likely to meet the

eligibility criteria for each synthesis (see Section 3.1.1 Types of studies; Section 3.3.1 Selection of studies).

In assessing ‘unknown-unknowns’, we will judge whether the studies not identified were likely to have results eligible for inclusion (e.g. for broad outcome domains such as ‘pain’, it is likely that for particular conditions, missing studies would have been eligible for inclusion). We will use funnel plots and contour enhanced funnel plots to examine whether there is evidence of small study effects [52]. If there is funnel plot asymmetry, we will undertake a sensitivity analysis to compare the combined effect estimated from the random-effects model (primary analysis) with that estimated from a fixed (common) effect model. If the random-effects estimate is importantly larger than the fixed-effect estimate, with no explanation for the difference (e.g. differences in clinical populations or intensity of the delivery of intervention between small and large trials, differences in risk of bias between small and large trials), then we will downgrade for ‘suspected’ reporting bias.

### **3.3.9 Data synthesis**

#### **Meta-analysis**

Separate comparisons will be set up based on outcome domains agreed in the final framework (see Figure 2). These comparisons will be stratified in two ways. First, by the population groups in the final framework (see Figure 2 and 3.1.2 Types of participants for indicative groupings). This approach to structuring the meta-analysis will yield an overall estimate of the effect of Bowen therapy for the outcome (review objectives 1, 2 and 4), as well as estimates within each population group (review objective 2). Subgroup analysis by population group will allow examination of whether these population groups explain any observed statistical heterogeneity in the intervention effects (Section 3.3.9 Subgroup analysis). Second, by study design, where we will separately combine estimates from randomised trials and non-randomised studies. We will not calculate an overall estimate of the effect of Bowen therapy across these study design strata.

We will combine the effects using a random effects meta-analysis model, since we expect there to be clinical and methodological diversity across the trials that may lead to statistical heterogeneity. These analyses will use the restricted maximum likelihood estimator (REML) of between trial heterogeneity variance and the Hartung-Knapp-Sidik-Jonkman confidence interval method.

Forest plots will be used to visually depict the intervention effect estimates and their confidence intervals. Forest plots will be stratified by condition and risk of bias (within population group).

#### **Summary and synthesis when meta-analysis is not possible**

Available effect estimates (95% confidence intervals, p-values), details of scales (direction and range), risk of bias assessments, and intervention characteristics will be tabulated. Tables will be ordered by outcome domain, population group and risk of bias assessment.

For a particular comparison, if we are unable to analyse most of the effect estimates (due to incomplete reporting of effects and their variances, variability in the effect measures across the studies), we will consider alternative synthesis methods, such as calculating summary statistics of the effect estimates, combining p-values, or vote counting based on the direction of effect [53]. Our choice of method will be determined by the available data (e.g. summary statistics if data permit; other methods if the data are more limited).

#### **Subgroup analysis and investigation of heterogeneity**

We will undertake a subgroup analysis to examine whether population group explains any observed statistical heterogeneity in the intervention effects (see Figure 2 and 3.1.2 Types of participants for indicative population groupings).

### Sensitivity analyses

We plan to undertake and report sensitivity analyses examining if the meta-analysis estimates are robust to the:

- *meta-analysis model*. In addition to fitting a random-effects model, we will fit fixed effect models. This analysis will be undertaken to investigate the impact of any small-study effects.
- *inclusion of trials judged to be at an overall high or unclear risk of bias*. We will exclude trials judged to be at an overall high or unclear risk of bias.

Results of the sensitivity analyses will be tabulated, including the meta-analysis estimate (and its confidence interval), along with details of the original and sensitivity analysis assumptions.

### 3.3.10 Summary of findings tables and assessment of certainty of the body of evidence

We will prepare GRADE summary of findings tables for each of the main comparisons, reporting results for critical and important outcome domains (up to seven). For each result, one author (SB) will use the GRADE approach to assess our confidence in where the effect lies relative to our threshold for a small effect (the certainty of evidence) (see 3.3.4 Measures of treatment effect). In accordance with detailed GRADE guidance [41, 46, 54], an overall GRADE of high, moderate, low or very low certainty will be reported for each result based on whether there are serious, very serious or no concerns in relation to each of the following domains.

1. Risk of bias. We will assess the overall risk of bias across all studies contributing to each synthesised result, considering the weight studies rated at high risk of bias contribute to the analysis. Serious, very serious or extremely serious concerns are more likely if studies at risk of bias contribute considerable weight in the analysis and sensitivity analyses indicate that removing these studies changes the size of the effect (see 3.3.9 Sensitivity analyses) [41, 54].
2. Inconsistency. We will assess whether there is important, unexplained inconsistency in results across studies considering the overlap of confidence intervals (non-overlap indicating potentially important differences in direction or size of effect), statistical measures that quantify and test for heterogeneity (I<sup>2</sup> statistic,  $\chi^2$  test), results of subgroup analyses (see 3.3.7 Assessment of heterogeneity), and where the point estimates lie in relation to the threshold for an important effect (if all to one side of a threshold, we were less concerned) [55]. To enhance our interpretation of whether inconsistency is important, we will also examine the prediction interval, considering whether it included values that lead to a different conclusion than an assessment based on the confidence interval [56]. Where a result is based on a single study, inconsistency will not be rated.
3. Imprecision. We will assess whether the confidence interval for each pooled effect estimate crosses our threshold for an important effect (e.g. including a small effect and little or no difference, which would lead to different interpretations) and, for large effects, whether the sample size meets the optimal information size (based on number of events for binary outcomes; sample size for continuous outcomes). In judging imprecision, we will use our thresholds for a small but important effect as specified in 3.3.4 Measures of treatment effect. We will rate down for serious imprecision when the confidence interval crosses one threshold, very serious when two thresholds are crossed, and extremely serious when the confidence interval is so wide that the estimate is considered uninterpretable [43, 45].

4. Indirectness. We will assess whether there are important differences between the characteristics of studies included in each synthesis and the question we are seeking to address, such that the effects observed may not apply to our question (i.e. the applicability of the evidence). For example, differences between the delivery of the Bowen therapy in the study compared to Australia that are likely to influence the size of effect.
5. Publication bias. Our judgement of suspected publication bias will be based on assessment of bias due to missing results (see 3.3.8). In these assessments, we will also consider the potential impact on each synthesised result of excluding studies in languages other than English.
6. Upgrading domains (large effect size, dose response gradient, opposing plausible residual confounding). For NRSIs, we will consider large effects, any dose response, and opposing residual confounding as part of the ROBINS-I assessment (judging whether any of these factors mitigate concerns that observed effects are due to residual confounding) [41]. For this reason, upgrading of NRSIs will not be considered. There is no precedent for rating up the evidence from randomised trials, however in principle, these domains apply to any body of evidence so are included here for completeness.

Using GRADE decision rules, we will derive an overall GRADE for the certainty of evidence for each result included in the summary of findings table [20, 54]. A result from a body of evidence comprised of randomised trials begins as 'high' certainty evidence (score=4), and can be rated down (-1 or -2) for serious or very serious concerns on any GRADE domain that reduces confidence that the Bowen therapy has at least a small effect (as determined by the pre-specified thresholds) [20, 44, 54]. A result from a body of evidence comprised of NRSIs will also begin as 'high' certainty, with the same rules for rating down used as for randomised trials. The option to rate down by -3 may be considered if there are extremely serious concerns about risk of bias (especially for NRSIs) or imprecision (where results are compatible with both important benefit and important harm) [43, 57].

Summary of findings tables will be prepared using the GRADEpro GDT software ([www.grade-pro.org](http://www.grade-pro.org)). The tables will include:

- estimates of the effects of the Bowen therapy reported as standardised mean differences, and for binary outcomes relative and absolute effects
- the overall GRADE (rating of certainty) and an explanation of the reason(s) for rating down (or up) [58]
- the study design(s), number of studies and number of participants contributing data
- a plain language statement interpreting the evidence for each comparison and outcome, following GRADE guidance for writing informative statements [59].

Where results for a comparison and outcome from both randomised trials and NRSIs are available, these will be presented in the same row of the summary of findings table providing that the certainty of evidence available from randomised trials is not lowered by inclusion of NRSIs at higher risk of bias than the trials [60]. This approach will enable an overall conclusion to be drawn from the body of evidence where appropriate to do so. Doing so may also ameliorate concerns about indirectness (if direct evidence is available from NRSIs) and imprecision (if high or moderate certainty evidence is available from NRSIs). If the certainty of evidence is lowered by inclusion of NRSIs at higher risk of bias than RCTs, or if results from NRSIs and RCTs are not coherent (i.e. both leading to an interpretation of a small but important improvement), then we will report the results in separate rows with separate GRADEs and interpretations.

We will present the four levels of certainty of evidence in summary of findings tables with the following symbols and interpretations.

- High ( $\oplus\oplus\oplus\oplus$ ): further research is very unlikely to change the confidence in the estimate of effect
- Moderate ( $\oplus\oplus\oplus\ominus$ ): further research is likely to have an important impact in the confidence in the estimate of effect
- Low ( $\oplus\oplus\ominus\ominus$ ): further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate
- Very low ( $\oplus\ominus\ominus\ominus$ ): any estimate of effect is very uncertain

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## Appendix 1: Database and register search strategies

### Cochrane Central Register of Controlled Trials

| # | Search strategy                                                                                                              |
|---|------------------------------------------------------------------------------------------------------------------------------|
| 1 | ((bowen NEAR/1 (therap* or technique* or treat* or practice* or practitioner* or fascia*)) or bowtech or bowenwork):ti,ab,kw |

### MEDLINE via Ovid

| # | Search strategy                                                                                                                       |
|---|---------------------------------------------------------------------------------------------------------------------------------------|
| 1 | ((bowen adj1 (therap* or technique* or treat* or practice* or practitioner* or fascia*)) or bowtech or bowenwork).af. [af=all fields] |

### Embase via Ovid

| # | Search strategy                                                                                                                       |
|---|---------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Bowen Therapy/                                                                                                                        |
| 2 | ((bowen adj1 (therap* or technique* or treat* or practice* or practitioner* or fascia*)) or bowtech or bowenwork).af. [af=all fields] |
| 3 | or/1-2                                                                                                                                |

### AMED via Ovid

| # | Search strategy            |
|---|----------------------------|
| 1 | bowen*.af. [af=all fields] |

### Emcare via Ovid

| # | Search strategy                                                                                                                       |
|---|---------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Bowen Therapy/                                                                                                                        |
| 2 | ((bowen adj1 (therap* or technique* or treat* or practice* or practitioner* or fascia*)) or bowtech or bowenwork).af. [af=all fields] |
| 3 | or/1-2                                                                                                                                |

### CINAHL

| # | Search strategy                                                                                                  |
|---|------------------------------------------------------------------------------------------------------------------|
| 1 | TX (bowen W1 (therap* or technique* or treat* or practice* or practitioner* or fascia*)) or bowtech or bowenwork |

### Europe PMC

| # | Search strategy                                                                                                                                                                                                  |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | (TITLE:"bowen technique") OR (ABSTRACT:"bowen technique") OR (TITLE:"bowen therapy") OR (ABSTRACT:"bowen therapy") OR (TITLE:"bowenwork") OR (ABSTRACT:"bowenwork") OR (TITLE:"bowtech") OR (ABSTRACT:"bowtech") |

**ClinicalTrials.gov and WHO ICTRP**

Bowen (limited to Intervention/treatment in ClinicalTrials.gov) and Bowen (not limited to any specific field in WHO ICTRP)

**Google Scholar**

Advanced search options (phrase in title): "bowen therapy", "bowen technique", "bowen treatment", "bowen practice", bowenwork, bowtech

## Appendix 2: Study design features checklist

The following checklist is from Reeves et al [29]. The checklist is intended to be used as a tool for confirming eligibility of studies for the review and describing the design features of each included study. In this case, it is used to indicate how studies will be labelled in the review.

- Responses for each design were completed for this systematic review (not taken from the paper) to indicate the minimum features required for inclusion of each type of study (labelled 'Yes').
- Alternatives to these minimum features are labelled 'Possible'.
- In most cases, the combination of features labelled 'Yes' distinguishes the type of study (i.e. NRCT versus cohort).

| Study design feature                                                                                        | Feature of           |                    |                      |                |          |
|-------------------------------------------------------------------------------------------------------------|----------------------|--------------------|----------------------|----------------|----------|
|                                                                                                             | NRCT                 | Prospective cohort | Retrospective cohort | Controlled ITS | CBA      |
| 1. Was the intervention/comparator (answer 'yes' to more than one item, if applicable):                     |                      |                    |                      |                |          |
| • allocated to (provided for/administered to/chosen by) individuals?                                        | Yes (or clusters)    | Yes                | Yes                  | Possibly       | No       |
| • allocated to (provided for/administered to/chosen by) clusters of individuals?                            | Possibly             | No                 | No                   | Yes            | Yes      |
| • clustered in the way it was provided (by practitioner or organizational unit)?                            | Possibly             | Possibly           | Possibly             | Possibly       | Possibly |
| 2. Were outcome data available (answer 'yes' to only one item):                                             |                      |                    |                      |                |          |
| • after intervention / comparator only (same individuals)?                                                  | Yes                  | Yes                | Yes                  | No             | No       |
| • after intervention/comparator only (not all same individuals)?                                            | No                   | No                 | No                   | No             | No       |
| • before (once) AND after intervention/comparator (same individuals)?                                       | Possibly             | Possibly           | Possibly             | No             | Possibly |
| • before (once) AND after intervention/comparator (not all same individuals)?                               | No                   | No                 | No                   | No             | Yes      |
| • multiple times before AND multiple times after intervention/comparator (same individuals)?                | Possibly             | Possibly           | Possibly             | Possibly       | No (ITS) |
| • multiple times before AND multiple times after intervention/comparator (not all same individuals)?        | No                   | No                 | No                   | Yes            | No (ITS) |
| 3. Was the intervention effect estimated by (answer 'yes' to only one item):                                |                      |                    |                      |                |          |
| • change over time (same individuals at different time-points)?                                             | No                   | No                 | No                   | No             | No       |
| • change over time (not all same individuals at different time-points)?                                     | No                   | No                 | No                   | No             | No       |
| • difference between groups (of individuals or clusters receiving either intervention or comparator)?       | Yes                  | Yes                | Yes                  | Yes            | Yes      |
| 4. Did the researchers aim to control for confounding (design or analysis) (answer 'yes' to only one item): |                      |                    |                      |                |          |
| • using methods that control in principle for any confounding?                                              | No                   | No                 | No                   | Yes            | No       |
| • using methods that control in principle for time invariant unobserved confounding?                        | No                   | No                 | No                   | No             | Yes      |
| • using methods that control only for confounding by observed covariates?                                   | Yes [exclude if not] | Yes                | Yes                  | Possibly       | Possibly |

| Study design feature                                                                                                                      | Feature of |                    |                      |                |          |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|----------------------|----------------|----------|
|                                                                                                                                           | NRCT       | Prospective cohort | Retrospective cohort | Controlled ITS | CBA      |
| 5. Were groups of individuals or clusters formed by (answer 'yes' to more than one item, if applicable):                                  |            |                    |                      |                |          |
| • <i>randomization?</i>                                                                                                                   | No         | No                 | No                   | No             | No       |
| • <i>quasi-randomization?</i>                                                                                                             | No         | No                 | No                   | No             | No       |
| • some other action of researchers?                                                                                                       | Yes        | Possibly           | Possibly             | Possibly       | No       |
| • <i>time differences?</i>                                                                                                                | No         | No                 | No                   | Yes            | No       |
| • location differences?                                                                                                                   | Possibly   | Possibly           | Possibly             | Possibly       | Possibly |
| • healthcare decision makers/practitioners?                                                                                               | Possibly   | Possibly           | Possibly             | Possibly       | Yes      |
| • participants' preferences?                                                                                                              | Possibly   | Yes                | Yes                  | No             | Possibly |
| • on the basis of outcome? e                                                                                                              | No         | No                 | No                   | No             | No       |
| • some other process? (specify)                                                                                                           | Possibly   | Possibly           | Possibly             | Possibly       | Possibly |
| 6. Were the following features of the study carried out after the study was designed (answer 'yes' to more than one item, if applicable): |            |                    |                      |                |          |
| • characterization of individuals/clusters before intervention?                                                                           | Yes        | Yes                | Possibly             | Possibly       | Possibly |
| • actions/choices leading to an individual/cluster becoming a member of a group?                                                          | Yes        | Yes                | Possibly             | Possibly       | Possibly |
| • assessment of outcomes?                                                                                                                 | Yes        | Yes                | Possibly             | Possibly       | Possibly |
| 7. Were the following variables measured before intervention (answer 'yes' to more than one item, if applicable):                         |            |                    |                      |                |          |
| • potential confounders?                                                                                                                  | Yes        | Yes                | Yes                  | Possibly       | Possibly |
| • outcome variable(s)?                                                                                                                    | Possibly   | Possibly           | Possibly             | Yes            | Yes      |

NRCT: non-randomised controlled trial; ITS: interrupted time series; CBA controlled before-after studies

### Appendix 3: TIDIER domains and example of application in Bowen therapy SR

| Characteristic    | Description                                                                                                                    | Standard headings (bolded) and codes illustrated with an example*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Brief name        | Name or phrase                                                                                                                 | Bowen therapy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Why               | Rationale, theory or goal of essential elements                                                                                | Relief of chronic pain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| What              | Procedures, activities or processes including enabling/supporting activities                                                   | Basic relaxation procedures were applied in each session as a common baseline treatment. Bowen moves were applied to both the left and right sides of the body as a pair with a 2–5 min pause between a set of moves. Each set was composed of 2–8 Bowen procedures. The moves consisted of four steps of patterned manoeuvres. The fingers were located onto the starting point with minimum pressure, and then the skin was engaged laterally or medially. Following this, downward pressure was applied to sink the tissue and held for 3–4 s to challenge the target tissue. Finally, the fingers were moved across the target tissue while maintaining pressure to disturb the underlying tissues.                                                                                          |
|                   | Materials (physical or informational)                                                                                          | <b>CO-INTERVENTIONS (code all that apply):</b> written information leaflet, educational material, other [specify], none reported**<br><b>Aids could include:</b> Standardized instructions were given to the participants before and following each session. Participants were encouraged to walk, drink plenty of fluids, and avoid strenuous resistance exercise after the treatment. Hot sauna or spas up to 24 h before and after treatment were discouraged.                                                                                                                                                                                                                                                                                                                                |
| When and how much | Number of times delivered, over what period of time, number of sessions, their schedule, and their duration, intensity or dose | 3 x 45-60 minute weekly sessions, followed by 3 x 45-60 minute fortnightly sessions, over 8 weeks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| How               | Modes of delivery ( )                                                                                                          | <b>CODE</b> (choose all that apply): individual, group; in person, online, other [specify]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Who provided      | Intervention provider by category and their expertise, background and training                                                 | <b>Administered by a provider:</b> [Y/N] <b>Self-administered:</b> [Y/N]<br><b>Provider</b> (as identified by authors, code all that apply)<br><ul style="list-style-type: none"> <li>○ Bowen therapists</li> <li>○ Other natural therapist [specify]</li> <li>○ Nurse (clinically qualified)</li> <li>○ Allied Health [specify e.g. physiotherapist]</li> <li>○ General practitioner/ physician [specify]</li> <li>○ Research staff</li> <li>○ Other [specify]</li> <li>○ Not reported</li> </ul> <b>Highest level of training</b> (for health-care providers only): postgraduate, bachelor, diploma, certificate, other [specify], not reported<br><b>Trained in Bowen therapy?</b> [Y/N/not reported] <b>Details:</b> registered Bowen therapy practitioners with minimum 1 year's experience |
| Where             | Type of location where intervention occurred                                                                                   | University campus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Tailoring         | If personalised, titrated or adapted describe what, why, when and how                                                          | additional procedures were chosen based on the presenting symptoms of the participant on the day                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Modifications     | Not collected. Any modifications are likely to be part of protocol (i.e. tailoring)                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| How well          | Not collected. Used for questions about <i>adherence</i> to intervention (not assignment to intervention)                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

\* Example from doi: 10.1016/j.jbmt.2020.06.025; Australian New Zealand Clinical Trials Registry (#12615000364572; <http://www.anzctr.org.au>) \*\* Codes highlighted in grey are the codes that apply to this example