A multicomponent educational intervention to improve general practice registrars' prescribing of benzodiazepines and related drugs: the BENEFIT study protocol for a prospective controlled study.

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32 Items from the World Health Organisation Trial Registration Data Set

Data category	Information
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Contact for Public Queries	Professor Parker Magin: parker.magin@newcastle.edu.au
Contact for Scientific Queries	Professor Parker Magin
Public Title	Evaluation of a Multicomponent educational package for GP registrars in improving guideline compliance for prescription of benzodiazepines and related drugs in general practice.
Scientific Title	Evaluation of a multicomponent educational package for GP registrars in improving guideline compliance for prescription of benzodiazepines and related drugs in general practice: a pragmatic evaluation employing a non-equivalent control groups design nested within an ongoing cohort study, and post-intervention qualitative evaluation.
Countries of Recruitment	Australia
Health Condition(s) or Problem(s) Studied	Latrogenic harm from Potentially Inappropriate prescription of benzodiazepines and related drugs by GP registrars.
Intervention(s)	Intervention name: Education package Intervention description: 1. Pre- and Post- workshop educational resources. 2. A 40 minute registrar face-to-face educational workshop 3.A 60 minute online supervisor webinar based on the face-to-face educational workshop 4. An optional joint GP registrar/supervisor educational activity Control description: 'Usual education'.

Key Inclusion and Exclusion Criteria	Inclusion: Intervention group: Registrars in Terms 1 and 2 of their vocational training program at one Regional Training Organisation (RTO) (GP Synergy). Control group: Registrars in Terms 1 and 2 of their vocational training program at two RTOs (GPTT and EVGP). Exclusion: Registrars who do not provide consent for the data they collect as part of the ReCEnT project to be used for research purposes.
Study Type	Observational with evaluation of the educational package being nested within an ongoing cohort study (ReCEnT). For the purposes of the ANZCTR format, however, we have classified the study type as Interventional. Method of allocation: Non-randomized: Masking: Not used: Assignment: Parallel Purpose: Educational/ counselling/training.
Date of First Enrolment	3/5/2018
Sample size	624
Recruitment Status	Recruiting
Primary Outcome(s)	Primary outcome [1]: The primary outcome factor will be 'frequency of benzodiazepine prescription' as measured by ReCEnT data. Time frame: two months pre-intervention in 2018. Post-intervention ReCEnT data will be collected four months post-intervention.
Key Secondary Outcomes	Secondary outcome [1] 'frequency of benzodiazepine initiation' as measured by ReCEnT data. Time frame as for Primary outcome [1]. Secondary outcome [2]: Change in anticipated prescribing behavior as measured by responses to clinical vignettes in a questionnaire. Time frame: one month pre-intervention and two months post intervention.
Ethics Review	18/04/2018 Ethics reference number: H-2009-0323
Completion date	
Summary Results	N/A
IPD sharing statement	Advice from the approving ethics committee precludes making the database publicly available. Participants in the ReCEnT study have in the past not provided explicit consent for their data to be made available in this way and some of the data analyzed in this project will be of participants who have not provided that consent. IPD will not be shared.

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Abstract

Background: There are limited evidence-based indications for use of benzodiazepines and related medicines (including Z-drugs) in general practice. These drugs are associated with frequent and serious adverse effects. Despite this, they are frequently prescribed by general practitioners (GPs), including frequent prescribing by GPs in training (in Australia termed 'registrars'). There is evidence that current educational approaches are not attenuating Australian GP registrars' prescribing of benzodiazepines and related medicines.

We aim to evaluate the effectiveness of a multi-component educational intervention designed to decrease GP registrars' prescribing of, and initiation of, benzodiazepines and related medicines.

Methods/design: We will use a pragmatic non-randomised, non-equivalent control group design nested within an ongoing cohort study of registrars' practice (the Registrar Clinical Encounters in Training study; ReCEnT) to assess the intervention's impact on benzodiazepine prescribing in patients 16 years-and-over.
The registrar educational intervention includes a face-to-face session with pre- and post-session readings, and a webinar for their supervisors, plus facilitation of the registrar-supervisor dyad in weekly one-on-one in-practice teaching meetings. The face-to-face session and webinar will focus on non-pharmacological management of anxiety and insomnia. Facilitating in-practice teaching will include provision of frameworks for case-based discussions involving non-pharmacological management of clinical scenarios that are often treated (contrary to evidence-based guidelines) in general practice with benzodiazepines. The components of the educational intervention are underpinned by the Behaviour Change Wheel (BCW) framework.
The primary outcome measure will be frequency of prescription of benzodiazepines and related drugs (including Z-drugs) by registrars. The secondary outcome will be initiation of benzodiazepines and related drugs (including Z-drugs). Further evaluation of the intervention will entail participant interviews (with registrars and supervisors) and registrars' pre- and post-intervention questionnaire responses.

Discussion: Early-career GPs are still developing their clinical practice and prescribing habits. They are an important group for educational interventions that encourage non-pharmacological management of anxiety and insomnia rather than use of benzodiazepines and related drugs.

Trial registration: Australian New Zealand Clinical Trials Registry, ACTRN12618000824268 (registered 15/05/2018).

Keywords: Benzodiazepines, Hypnotics and Sedatives, General practice, Graduate medical education, Physician prescribing patterns, Evidence-based medicine

Introduction

Background and rationale

A considerable evidence-practice gap exists in the area of the prescribing of benzodiazepines and benzodiazepine-like drugs, including the Z-drugs, by Australian GP registrars (trainees or residents in general practice).[1] There are important clinical implications for patients and health systems of a lack of adherence to evidence-based guidelines. The result is an over-reliance on pharmacotherapy for the management of anxiety and insomnia.

Outside the infrequent (in general practice) indications such as acute alcohol withdrawal, guidelines and international recommendations reserve benzodiazepines for cautious short-term use in severe or disabling anxiety or insomnia. The Australian Therapeutic Guidelines: Psychotropic, state 'although commonly used to treat anxiety in the past, benzodiazepines are not recommended for the treatment of these disorders other than in exceptional circumstances…large numbers of patients develop problems of tolerance and abuse'.[2] American guidelines for management of chronic insomnia advise cognitive behaviour therapy (CBT) and discourage benzodiazepine use (as strictly second-line short-term use, if at all).[3]

Benzodiazepine acute phase withdrawal phenomena range from trivial to major in nature (e.g. seizures, psychosis).[4] Protracted withdrawal phenomena have been described by 15-44% of benzodiazepines-users following as little as 3-6 weeks use.[4] Withdrawal symptoms have been reported as lasting over a year.[4] Withdrawal attempts are thus difficult, with relapse rates of 49%-57% reported.[4] Associations of benzodiazepine use include: paradoxically worsening insomnia, Alzheimer's disease, falls and fractures, adverse drug reactions, pneumonia, and increased mortality.[5-9] Benzodiazepines are associated with overdose, especially in combination with opioids.[10, 11] Opioids and antitussives are common causes of drug interactions in benzodiazepine users.[8] The combination of benzodiazepine abuse and alcohol abuse is common and particularly problematic.[12] A recent authoritative systematic review has found benzodiazepines to be associated with markedly increased overall mortality.[13]

In recent years, the Z-drugs (zopiclone, zolpidem, zaleplon) have been promoted as hypnotics and as being safer than benzodiazepines[14] and this promotion has been successful in shaping GP attitudes.[15] Z-drugs, however,

have proven to be extremely problematic with adverse side-effect profiles comparable with benzodiazepines[16-21] and with hypnotic effects of questionable clinical significance.[22]

Most benzodiazepines are prescribed in primary care by GPs.[23] In the Registrar Clinical Encounters in Training (ReCEnT) database (now comprising over 200,000 consultations), benzodiazepines and related drugs are prescribed in 2.1% of all registrar consultations and comprise 2.2% of all prescriptions.[1] Of benzodiazepine and related drug prescriptions, 6.6% are for zopiclone or zolpidem.[24] They are prescribed most frequently for insomnia (28.2%) or anxiety (21.8%), but half are for mainly 'off-label' indications.[1] This data also demonstrates that registrars prescribe benzodiazepines mainly as maintenance therapy to patients with whom they are unfamiliar and to older patients, inconsistent with current guideline recommendations.[1] This represents problematic prescribing behaviour and a compelling target for behavioural-based education. The geographic variation in benzodiazepine prescribing between Regional Training Organisations (RTOs: the geographically defined providers of general practice training)[1] also suggests scope for behaviour change in this population of GP registrars. Educational interventions to change registrars' benzodiazepine prescribing behavior could also be informed by other findings from the ReCEnT study (such as Aboriginal and Torres Strait Islander patients being more likely to receive benzodiazepines, and male registrars being more likely to prescribe benzodiazepines).[1]

Longitudinal analyses of temporal changes in overall GP registrar benzodiazepine-prescribing in the ReCEnT study suggest there has been a modest reduction in overall registrar benzodiazepine prescribing rates over the period 2010-16, though prescribing rates remain problematically high.[24] Overall prescribing of benzodiazepines by registrars (adjusted for multiple potential confounders) reduced by a statistically significant 6% per year.[24] Longitudinal within-registrar analysis, however, shows that individual registrars' benzodiazepine prescribing does not reduce during training.[24]

Thus, this is a complex situation. One interpretation of these findings is that there has been a decrease in the benzodiazepine prescribing in the wider general practice environment which registrars enter on commencing GP training [25]. This possibly reflects an effect of health authorities' efforts to reduce benzodiazepine prescribing in the wider general practice context. This changing practice context would influence registrars who learn in an apprenticeship-like training model. Our results, however, suggest that Australian GP vocational training does not

produce any change in registrars' benzodiazepine-prescribing and, so, does not contribute to the welcome (though, thus far, insufficient) recent reduction in benzodiazepine-prescribing.

Hence, carefully designed and delivered educational interventions to promote rational prescribing of benzodiazepines in current and future cohorts of GP registrars are much needed. Registrars are at an early stage of development of clinical practices and attitudes. GP prescribing behaviours established in the early stages of their career may tend to remain consistent over time.[26]

Our qualitative data, as well as data from ReCEnT, on antibiotic prescribing for non-pneumonia respiratory tract infections suggests that structural, behavioural and educational factors in the operation of the apprenticeship-like model of vocational GP training in Australia may reduce adherence to guidelines.[27, 28] Thus, interventions to produce change in registrars' guideline adherence should address the supervisor-registrar dyad rather than just the registrar.

Objectives and hypotheses

We aim to develop and test the efficacy of an educational intervention designed to reduce prescription of benzodiazepine and related drugs (*hereafter, 'benzodiazepines'*), informed by a theoretical approach and current evidence around interventions to influence clinician behaviour.

Our research question is: does a multicomponent educational intervention focusing on providing skills in non-pharmacological management of anxiety and insomnia can decrease general practice registrars' prescribing of benzodiazepines.

Our hypotheses are:

a) For registrars' prescribing of benzodiazepines and related drugs

In registrars enrolled with one Australian Regional Training Organisation who have received a multicomponent educational intervention on benzodiazepine and related drugs use and non-pharmacological managements of anxiety and insomnia, compared to registrars at two other Australian Regional Training Organisations who have not

received the intervention, there will be, for patients aged over 16 years, a greater decrease, from pre-intervention to post-intervention, of

i) The number of benzodiazepines prescribed by registrars per 100 consultations.

ii) The number of benzodiazepines initiated by registrars per 100 consultations.

b) for 'anticipated deprescribing behaviour' assessed by questionnaire

In registrars of one Australian Regional Training Organisation who have received a multicomponent educational intervention on benzodiazepine and related drugs use and non-pharmacological managements of anxiety and insomnia, there will be an increase pre-intervention to post-intervention in the number of registrars who make appropriate responses (including non-prescription of benzodiazepines) to each of several clinical vignettes involving clinical scenarios of anxiety or insomnia.

Study design

The principal element of the **BEN**zodiazepines: **E**nhancing compliance **F**or reduced prescribing **I**n **T**raining (BENEFIT) project is a pragmatic non-randomized trial employing a non-equivalent control group design, nested within an ongoing cohort study, the Registrar Clinical Encounters in Training (ReCEnT) Study.[29]
The project design also includes a questionnaire-based pre- and post-intervention analysis and a qualitative evaluation.
The three elements of the overall project are:

i) A quantitative evaluation of change in GP registrars' behaviour regarding benzodiazepine prescribing and initiation in patients aged 16 years or older, as measured by ReCEnT data. Data for this analysis will be collected during the six-monthly rounds of ReCEnT data collection.

ii) A quantitative evaluation of change in GP registrars' attitudes and knowledge regarding benzodiazepine prescribing, as measured by questionnaire responses to clinical vignettes. Pre- and post-intervention questionnaires will elicit participants' medication management responses to a number of general practice vignettes (clinical scenarios) involving anxiety or insomnia. These clinical vignettes will be

designed to reflect situations where prescribing of benzodiazepines is neither recommended nor warranted.

iii) A qualitative evaluation (involving semi-structured interviews) of: a) GP registrars' and supervisors' opinions on what elements of the educational intervention worked well and how it could be improved; and b) how GP registrars' practices have changed and barriers to / facilitators of such change.

Methods: Participants, interventions, and outcomes

Study Setting

The intervention will be delivered during a session at a routinely-scheduled educational workshop at the RTO, GP Synergy. RTOs are government-funded, not-for-profit, geographically-defined GP vocational training organizations. There are nine RTOs covering the whole of Australia. GP Synergy is the largest, delivering education and training across the state of New South Wales and the Australian Capital Territory with an intake of approximately 500 registrars per year (approximately one-third of the entire Australian intake).

The comparator RTOs will be Eastern Victoria GP Training (covering approximately half of the state of Victoria including half of the capital city, Melbourne) and General Practice Training Tasmania (covering the whole of the state of Tasmania). The intervention and comparator RTOs cover the full range of Australian GP training settings including practices located in all rural classifications.[30] All three RTOs participate in the ReCEnT project.

Within each RTO, registrars train in accredited independent practices under the supervision of an experienced GP supervisor (trainer, preceptor). This supervision includes a weekly face-to-face one-on-one teaching session for Term 1 and Term 2 registrars (these are the first of three 6-month full-time-equivalent compulsory general practice-based terms in registrars' 3-year vocational training program). Registrars also receive structured away-from-practice teaching organized by their RTO (at least 125 hours in total in Term 1 and Term 2).

Eligibility criteria

Participants will be Term 1 and Term 2 (that is, in the first 12 months of GP training for a full-time registrar) GP registrars at the three RTOs. The intervention to GP Synergy registrars will be conducted as part of their routine training program.

Inclusion criteria

For the analysis using ReCEnT study data: The intervention group will consist of registrars in Terms 1 and 2 of their vocational training program at one RTO (GP Synergy). The comparator group will consist of registrars in Terms 1 and 2 of their vocational training program at two RTOs (General Practice Training Tasmania – GPTT: and Eastern Victoria GP Training – EVGP).

For the questionnaire-based study: Participants will be registrars in Terms 1 and 2 of their vocational training program at one RTO (GP Synergy).

For the qualitative study: Participants will be registrars in Terms 1 and 2 of their vocational training program at one RTO (GP Synergy) and supervisors of GP Synergy registrars.

Exclusion criteria

For the analysis using ReCEnT study data: Registrars who do not provide consent for the data they collect as part of the ReCEnT project to be used for research purposes.

For the questionnaire-based study: No exclusions.

For the qualitative study: registrars or supervisors who have not attended the workshop or webinar

The intervention

The educational intervention consists of several components. The first two components, a face-to-face session and associated pre-workshop readings, will be delivered to GP registrars.

The third component is a webinar for the supervisors of these registrars that will be based on the content of the face-to-face presentation. Supervisors will also be provided with pre-webinar readings.

The fourth component is an optional joint GP registrar-supervisor education activity for each registrar-supervisor dyad to use in their regular weekly one-on-one teaching meetings.

The face-to-face registrar educational session will be delivered as a 40-minute session. The supervisor educational intervention via webinar will be delivered as a one-hour session.

The first three components of the intervention will be delivered in June 2018 during General Practice Training Term 2018.1. The fourth component will be delivered at the discretion of supervisors and registrars during the first two months (July-August) of General Practice Training Term 2018.2.

Theoretical framing of intervention content

Interventions aimed at improving clinical practice often require behaviour change among health care providers. The Behaviour Change Wheel (BCW)[31] was chosen as a framework to guide intervention development as it provides a systematic approach through the steps of understanding the target behaviour, identifying relevant intervention functions and specifying intervention content. The BCW has also previously formed a basis of a benzodiazepine deprescribing intervention for older patients.[32]

Given current high levels of benzodiazepine prescribing,[1] having registrars comply with current guidelines for use of benzodiazepines will require considerable changes in behavior. The BCW consists of three layers or phases, offering a step-by-step method for designing behaviour change interventions. The first stage in the BCW theoretical guide helps researchers identify the potential predictors of the behaviour(s), known as COM-B, standing for 'capability', 'opportunity', 'motivation' and 'behaviour', which would need to change to address the core health problem(s). The second phase in the theoretical process involves the analysis of nine key intervention functions (education, persuasion, incentivization, coercion, training, restriction, environmental restructuring, modelling and enablement), depending on the particular COM-B analysis, which can facilitate a change in a behaviour.[31] It also outlines the individual behaviour change techniques (BCTs), which can best change the behaviours. In total, there are 93 BCTs within 16 groupings. The third, outer, layer (the rim of the wheel) identifies seven policy areas, which one could employ to change the behaviour. To address appropriate de-prescribing, registrars/GPs must have the appropriate capability (which can be physical or psychological) to address knowledge, skills and stamina to perform

229 the behaviour. There must also be the opportunity for the appropriate prescribing to occur, in terms of a conducive
230 physical and social environment. The capability and opportunity to do the behaviour leads to motivation, which can
231 be reflective or automatic. Registrars' 'Sources of Behaviour' ('Capability, Opportunity, and Motivation') in relation
232 to de-prescribing will be addressed by intervention elements addressing Education, Persuasion, Training,
233 Enablement, Modelling, and Environmental restructuring (six of the nine BCW 'Intervention Functions'). See Table 1.

234 PLACE TABLE 1 ABOUT HERE

235 *Components of the intervention: Workshop pre-reading*

236 Three journal papers will be made available to registrars and supervisors. These cover the areas of benzodiazepine
237 misuse and dependence [33], anxiety management [34], and non-pharmacological management of insomnia [35].

238 The pre-workshop readings will be made available to registrars and supervisors two weeks prior to the face-to-face
239 session and webinar, respectively.

240 *Components of the intervention: Educational workshop session*

241 The face-to-face workshop session will consist of a 40-minute educational presentation to approximately 450
242 registrars, scheduled as part of the standard training program for GP registrars delivered at GP Synergy RTO. The
243 face-to-face session will be led by an addictions specialist who is also a GP and supervisor of GP registrars. The
244 session will be co-delivered by an experienced clinical psychologist with particular expertise in the education of non-
245 psychologists in non-pharmacological anxiety and stress management strategies.

246 In this face-to-face session, data on GP registrars' benzodiazepine prescribing collected in the ReCEnT project will be
247 used to contextualize and reinforce the practical relevance and importance of the educational message (the ReCEnT
248 data will be that of registrars who have participated in ReCEnT during 2010 to 2017). Time will be devoted to the
249 practicalities of how to teach patients distracting, mindfulness, and relaxation / self-calming techniques within a
250 general practice setting. Collaborative models of registrars, supervisors and practices working together to
251 implement appropriate practices and policies regarding benzodiazepine use will be promoted.

Post-session supporting resources will be available as links in a post-workshop email to reinforce the workshop and provide practical resources including links to a sleep diary for patient use; patient information materials concerning sleep hygiene and management of stress and anxiety and simple Cognitive Behaviour tools for dealing with anxiety; and e-Mental Health Programs.

The workshop session content will be constructed by the research team consisting of GPs, GP vocational training educators, academic GPs, addictions specialists and a clinical psychologist. The process will be informed by the current literature in the area and our recent work in documenting GP registrars' benzodiazepine prescribing, including the prevalence and associations of this prescribing[36].

Components of the intervention: Webinar for supervisors

The webinar content will be based on the content of the registrar face-to-face session. The webinar will also emphasize the need for supervisors to work towards practice cultures where registrars' evidence-based management of anxiety and insomnia, and appropriate use of benzodiazepines is supported. The role of the supervisor and registrar working collaboratively in managing patients who may have an expectation of benzodiazepine prescription, or in managing safe withdrawal of patients from benzodiazepines, will be explored.

Components of the intervention: Joint registrar/ supervisor activity

Each registrar-supervisor dyad will be encouraged to include a case-based discussion of appropriate management of anxiety and insomnia, and of avoidance of benzodiazepine use, in their regular weekly one-on-one teaching meetings. The supervisor will be offered a set of three structured cases to include in the meeting. The supervisor and registrar will also be encouraged to perform an informal audit and notes review of patients who have received benzodiazepine prescriptions from registrar or supervisor. The joint registrar/supervisor activity will be optional as the content of registrar-supervisor weekly meetings is at the discretion of the supervisor and registrar rather than the RTO.

Rationale of intervention components

Reducing benzodiazepine prescribing involves changing clinicians' (in this case, registrars') behaviour. In keeping with the overarching theoretical framing of the intervention within the BCW, aspects of the intervention were

informed by a number of evidence sources. We have also designed our intervention components, where possible, to be consistent with modalities for which there is evidence of efficacy in changing clinician behavior. We incorporated the findings of the Cochrane Collaborations Effective Practice and Organisation of Care (EPOC) Review Group, wherever possible, in our intervention components.[37]

The rationale for supplementing the educational intervention with supervisor and joint registrar-supervisor educational activities is the registrar-supervisor relationship which is the key factor in registrar training. [38-41] Our previous research has suggested that the prescribing patterns (role-modelling) of supervisors and the 'apprenticeship' model of the registrar-supervisor relationship are drivers of inappropriate antibiotic prescribing behaviour [42-44]. It is likely that these will have similar influence on inappropriate (or appropriate) benzodiazepine prescribing.

Thus, registrars working collaboratively with supervisors within shared-care models and within supportive practice environments is likely to be an optimal approach to avoidance of inappropriate benzodiazepine prescribing. Close shared-decision making will also be vital in supporting registrars in maintaining patient safety when benzodiazepine withdrawal is indicated. In designing the various components of our intervention, we have recognized the importance of the registrar-supervisor dyad and attempted to ground our suggested strategies in an understanding of how the dyadic relationship works in practice, including the varying degrees of registrar involvement/autonomy in shared management plans and decisions [45].

Educational meetings alone or combined with other interventions, can improve professional practice [46] and we will have the registrar workshop session and supervisor webinar as central elements of our educational package. Educational meetings in isolation, however, have limited capacity to effect change in complex behaviours [46]. We will employ other strategies in addition to our workshops. We will set the scene for our educational meetings with background materials designed to suit the needs of clinicians.

Audit and feedback have been found to lead to small but potentially important improvements in professional practice [47] and feedback may be more effective when the source is a supervisor or colleague [47]. A traditional audit process is not practicable for our educational package, but we will be encouraging supervisors and registrars

to perform an informal audit of the clinical notes of patients identified as having recently received a benzodiazepine prescription. We suggest that this process should prompt joint discussion and feedback from the supervisor to the registrar.

Opinion leaders may positively influence clinicians' professional practice [48] . The main presenter at both the registrar session and supervisor webinar will be a clinician who practices both as an addictions specialist and as a GP. He is also an experienced supervisor of GP registrars, has published frequently on clinical drug and alcohol issues in journals and periodicals widely read by Australian GPs [49-52] and presented widely on these issues at GP meetings and conferences. Consistent with the EPOC group's findings,[48] we will have as a co-presenter at the supervisor webinar another 'local' opinion leader within the supervisor community – a senior GP supervisor.

'Tailored' interventions take into account determinants of the participants' target behavior. They have been found to have small to moderate effect size [53]. We will specifically address known factors in GPs' prescribing of benzodiazepines [54-56]. We will also expressly address the perception of some GPs of a lack of alternatives to benzodiazepine prescription [55] and the perceived barriers, for other GPs, to delivering or referring for non-pharmacological alternative-to-benzodiazepine therapies, despite acknowledging their appropriateness.[56]

Educational meetings are more efficacious when they are interactive [46]. We are limited by structural aspects of our face-to-face session with registrars (the size of the audience and venue) but we will encourage supervisor interaction in the webinar.

Comparator group procedures

The 'comparator group' of registrars training with two other RTOs will receive "usual education" during the study period. Usual education comprises teaching/education as scheduled by the comparator RTOs and will include some education on benzodiazepines, anxiety and insomnia. 'Usual education' will not include the supervisor webinar nor provision of materials for use in registrar-supervisor practice-located teaching sessions.

Outcomes

Primary outcomes

The primary outcome will be:

- Change in the number of benzodiazepines prescribed by registrars per 100 consultations with patients aged 16 years or older. The number of benzodiazepines prescribed per 100 consultations with patients aged 16 years and older will be calculated using prescribing data recorded in-consultation by each registrar each six-months as part of the ReCEnT cohort study.

Secondary outcomes

Secondary outcomes will be:

i) Change in the number of benzodiazepines initiated by registrars per 100 consultations with patients aged 16 years or older. The number of benzodiazepines initiated per 100 consultations with patients aged 16 years and older will be calculated using prescribing data recorded in-consultation by each registrar each six-months as part of the ReCEnT cohort study.

ii) Change in 'intended' or 'anticipated' benzodiazepine prescribing as measured by responses to clinical vignettes in a questionnaire. Responses will be via multiple choice options of actions in response to each clinical vignette and will be classified as 'appropriate management (including no benzodiazepine) chosen' or 'appropriate management not chosen'. This outcome will apply only to intervention group registrars. Comparator group registrars will not participate in the questionnaire study. This outcome will be measured one-month pre-intervention and two months post-intervention.

iii) Registrars' and supervisors' experiences of undertaking the intervention as measured by semi-structured qualitative interview. This outcome will be measured two-four months post-intervention. This outcome will apply only to intervention group registrars and supervisors. Comparator group registrars or supervisors will not participate in the qualitative study.

'Benzodiazepines' (that is, 'benzodiazepines and related drugs') will be defined as International Anatomical Therapeutic Chemical codes 'N05B' and 'N05C'.

Rationale of outcomes

The ReCEnT data is a 'snap-shot' of individual consultations. We do not have data on previous or follow-up consultations and we do not have information of patients' past medical history or drug regimens. We only have data

on the conditions managed in the index consultation and the medicines prescribed in the index consultation. Without the contextual data, we are unable to ascertain the appropriateness or inappropriateness of the decision to prescribe in individual instances of benzodiazepines prescription or initiation. But given the infrequency of indication for benzodiazepines in general practice, overall prescribing and initiation data will be a robust measure of overall levels of inappropriate benzodiazepine prescribing and initiation.

The secondary analysis is of benzodiazepines initiations (newly-prescribed benzodiazepines). There will be different consultation and therapeutic dynamics operating for benzodiazepine initiation than for prescription renewal/continuance. Patient expectations of a benzodiazepine script will be different for script renewal as opposed to new management [57]. The considerable issue of potential benzodiazepine withdrawal symptoms [33] will also make benzodiazepine deprescribing more complex and difficult to negotiate than initial non-prescription. A further factor is the registrar's junior status. Just as GPs find difficulty in discontinuing inappropriate medicines initially prescribed by specialists [58], registrars may find it difficult to discontinue medicines initiated by their supervisor or another senior GP in their practice. There is certainly evidence of this pressure in registrars' prescription of antibiotics for patients for whom their supervisor or other senior GP has previously prescribed them [27].

Triangulation of findings of the secondary analysis of 'intended' or 'anticipated' prescribing (elicited in the vignette-based questionnaire) and those of the primary analysis of 'actual' prescribing (elicited via ReCEnT data) will provide evidence of the relative impact of the intervention on registrar knowledge and attitudes as opposed to impact on registrar practice. This will have implications for understanding the role of practice 'clinical milieu' versus specific educational process in registrar training and registrar behavior.

Sample size calculation

Project element 1: Primary analysis- evaluation of change in registrars' benzodiazepine prescribing

There will be approximately 450 registrars from the intervention RTO eligible to attend the face-to-face educational session and approximately 624 registrars, in all, with post-intervention data. Power-sample size calculations are based on this.

Assuming a similar pre-intervention prescribing rate in comparator and intervention consultations, and that the comparator group shows no change in prescribing rates from pre- to post-intervention, power has been estimated based on detectable differences in prescribing rates between intervention and comparator groups, post-intervention.

We have estimated the detectable effect size assuming a total sample size of 29,952 encounters with patients aged >16 years for 624 registrars, post-intervention. The intervention to comparator allocation ratio is approximately 2.7: 1. Assuming a benzodiazepine prescribing rate of 2.2 % in comparator consultations, we will have 80% power to detect a prescribing rate of 1.7 % in intervention consultations, post-intervention, at a two-sided significance level of 0.05. This corresponds with a 23% decrease in the prescribing rate (Relative risk (RR) = 0.77). Allowing for potential clustering of prescribing rates within registrars, assuming possible ICCs of either 0.01 or 0.02, we will be able to detect post-intervention prescribing rate decreases of 27% (RR=0.73) and 31% (RR=0.69). This assumes each registrar has 48 encounters, corresponding to Design Effects of 1.47 and 1.94, respectively.

Recruitment

Project element 1: Evaluation of change in registrars' actual deprescribing.

No additional recruitment will be required for this component. Participants will be Term 1 and 2 registrars enrolled in the three participating RTOs and will undertake ReCEnT project data collection as a routine part of their training programs.

Project element 2: A quantitative evaluation of change in GP registrars' attitudes and knowledge regarding medicines deprescribing, as measured by questionnaire responses to clinical vignettes

All Term 1 and Term 2 registrars at the intervention RTO will be approached by both email and post inviting them to complete the study questionnaire four weeks prior to the intervention. There will be a single follow-up email invitation to non-responders two weeks later. The sample frame will be the enrolment lists of the participating RTO. Post-intervention questionnaires will be sent to registrar participants by email and hard copy mailout two months post-intervention. A follow-up reminder email will be sent two-three weeks after distribution of the post-intervention questionnaire.

Project element 3: a qualitative evaluation of GP registrars' and supervisors' experience of the educational intervention.

All Intervention RTO registrars who have attended the face-to-face workshop session and all supervisors who have attended the webinar will be approached by both email and post inviting them to participate in either phone or Skype or Zoom interviews.

A reminder email will be sent two-three weeks following the initial invitation. The sample frame will be the attendance lists of the face-to-face workshop session and webinar.

Selection of responding registrars and supervisors for invitation will be purposive, based on age, gender, rurality of practice, place of graduation (Australian versus international). If possible, some registrar-supervisor dyads will be recruited.

Methods: Assignment of interventions (for controlled trials)

Assignment to intervention or control will not be random. Assignment will be at the level of RTO and on the basis of willingness and capacity of the intervention RTO to include the benzodiazepine prescribing intervention within their routine educational program.

A randomized control trial design is not appropriate for the BENEFIT evaluation of change in registrars' benzodiazepine prescribing. Regarding assignment to intervention or control at the level of RTO: assignment at the level of registrar or of other smaller units within the RTOs is impracticable. Registrars within each RTO share regular educational and professional contacts (for example, at RTO-delivered face-to-face educational sessions). Thus, assignment at levels less than RTO will result in risk of contamination.

Cluster randomization at the RTO level is also not viable. There are only three RTOs participating in the ReCEnT cohort study in which BENEFIT is nested. With a major reorganization of Australian vocational training in 2016 there are now only nine RTOs covering the whole of Australia.

Finally, the educational programs in which the intervention is to be included are crowded, with multiple topics competing for inclusion (necessitating considerable negotiation to justify a regular teaching place for a new session).

These are, furthermore, set up to 12 months in advance. Randomization of teaching sessions within their educational programs is not acceptable to RTOs.

The non-random allocation will be considered during analyses via multivariable analyses utilizing the large number of potential confounding variables measured in ReCEnT.

Independent variables measured in the ReCEnT project

Independent variables relate to registrar, patient, practice and consultation factors.

Registrar factors will be age, gender, training term at the time of the intervention (Term 1 or Term 2), place of basic medical qualification (dichotomized as Australia or international), if the registrar worked at the practice during a previous term, the RTO with which the registrar is enrolled, registrars' year of medical graduation, duration of pre-GP training time spent in hospital practice, and registrars' full-time/part-time status.

Patient factors will be age, gender, Indigenous (Aboriginal or Torres Strait Islander) status, non-English-speaking background, if the patient is a new patient to the practice and if the patient is new to the registrar.

Practice factors will be level of rurality of the practice location, practice size (number of full-time equivalent GPs dichotomized to 'large' (greater than five full-time equivalent GPs) or 'small' (less than six full-time equivalent GPs), socio-economic status of the practice location, and if the practice routinely bulk bills (that is, patients pay no fee for the consultation). Practice postcode is used to define the Australian Standard Geographical Classification-Remoteness Area (ASGC-RA[59]) classification (the degree of rurality) of the practice location and to define the practice location's Socioeconomic Index for Area (SEIFA[30]) Relative Index of Disadvantage.

Consultation factors will be duration of consultation (in minutes), the number of diagnoses/problems dealt with in the consultation, if the diagnosis/problem was new or was existing, if the problem/diagnosis was a chronic disease (classified according to an existing classification system), if pathology test/s was/were ordered, if imaging test/s was/were ordered, if follow-up was organized, if specialist referral was made, if the registrar sought clinical information during the consultation from a specialist or from electronic or hard-copy resources, and if the registrar generated a learning goal related to the problem/diagnosis.

Methods: Data collection, management, and analysis

Data collection

Project element 1: Evaluation of change in registrars' actual deprescribing.

No data will be collected beyond data already routinely collected in ReCEnT.

ReCEnT is an ongoing prospective multi-site cohort study of GP registrars/registrars' consultations. From 2010 to 2015 it was conducted in five of Australia's then 17 GP Regional Training Providers (RTPs) [60, 61] and from 2016 it has been conducted in three of Australia's nine RTOs (following the 2016 major restructure of Australia's general practice vocational training program).

ReCEnT longitudinally documents the nature and association of consultation-based clinical and educational experiences of GP registrars. Registrars record details of 60 consecutive consultations at approximately the midpoint of three six-month (full-time equivalent) terms based in general practices. Details are recorded on paper-based Case Report Forms and include patient demographics, diagnoses/problems managed, medications prescribed, medications ceased, investigations ordered, referrals made, follow-up arranged, information/assistance sought during the consultation (including supervisor advice and recourse to other sources of information – hard copy, electronic, specialist doctor), and learning goals generated. Only data of office-based consultations (not home visits or nursing home visits) are recorded.

Registrar characteristics and the characteristics of the practice they are currently training in are also documented via paper-based questionnaires.

ReCEnT is an integrated part of the registrars' training program and includes reflection on practice and future training directions via detailed feedback [60, 61]. The majority of GP registrars consent to the data also being used for research purposes. As a result, participation and retention rates are singularly high for studies of GPs – greater than 95%.

Project element 2: A quantitative evaluation of change in GP registrars' attitudes and knowledge regarding benzodiazepine prescribing, as measured by questionnaire responses to clinical vignettes

Term 1 and Term 2 registrars at the intervention RTO will complete pre- and post-intervention questionnaires. Participants will have the option of completing the questionnaire as a hard-copy or electronically via REDcap, a web application for managing online surveys.

The questionnaire will contain several clinical vignettes consistent with clinical presentations of patients in registrars' practice, comprising scenarios where benzodiazepine prescribing would be inappropriate. Registrars will be asked to respond to multiple choice options as to how they would manage these vignettes.

The questionnaire responses will be linked to the registrar's ReCEnT data via a unique identifier which will enable us to use demographic data collected during ReCEnT.

Participant retention and follow-up will be promoted through articles in the GP Synergy monthly Training Update newsletter (delivered electronically to all registrars monthly).

Project element 3: A qualitative evaluation of GP registrars' and supervisors' experience of the educational intervention.

Data collection will employ one-on-one interviews conducted by phone or Skype or Zoom (as elected by the participant registrar or supervisor). Interviews will be informed by an interview schedule based on the study aims and the literature but will be informant-led as much as possible and themes emerging from the interviews will iteratively inform revisions of the interview schedule.

Recruitment will continue until thematic saturation is deemed to have occurred (no new themes are emerging from the interviews).

Project documents

The ReCEnT Case Report Form, registrar demographics form, and practice characteristics form; BENEFIT pre- and post-intervention questionnaires; and BENEFIT qualitative study interview guide can be found at the BENEFIT project page in the GP Synergy NSW and ACT Research and Evaluation Unit sub-website at: https://research.gpsynergy.com.au/

Data management

Project element 1

All ReCEnT data collected is de-identified. Each GP registrar is allocated a unique numerical code to protect privacy which will be used on all survey forms instead of names. The de-identified ReCEnT data is entered at GP Synergy's premises into a Heroku secure on-line international computer database which is run by a USA-based organization. The list linking GP registrars name and ID number is stored separately in a password protected computer file at GP Synergy which is only accessible by specified members of the research team.

Project element 2

Electronic questionnaire data will be collected and managed using REDcap electronic data capture tools [62] hosted at Hunter Medical Research Institute (HMRI) in Newcastle, Australia. Any paper questionnaires will be transferred to the REDcap database, at which time the paper copy will be destroyed. Participant email addresses will be stored in a REDcap project "Participant list" module intended for sending emails and tracking responders/non-responders. Questionnaire responses are stored on a separate module. This means that at no stage will the participants' email addresses be directly linked to the survey responses. The ability to join these two modules is restricted and accessible only by authorized users. The REDcap participant list and survey responses will be stored on a password-protected server at HMRI with access permitted only by project personnel or HMRI authorised staff directly involved in the project. Research-related datasets are stored indefinitely by HMRI unless requested to archive by the study Chief Investigator or expire in a set timeframe.

Project element 3

Any information collected by the researchers which might identify participants will be removed from the interview transcripts. The transcripts will be stored securely. The transcript can only be accessed by the researchers. Interview data will be analysed and themes that emerge will be reported in an aggregated format and individuals will not be identified/identifiable in any findings reported. The data will be stored securely for at least five years on GP Synergy's password protected computer system prior to being destroyed in accordance with State and Commonwealth legislation.

Statistical methods

Analysis of benzodiazepine prescribing behaviour (Project element 1)

Change in GP registrars' benzodiazepine prescribing behaviour will be assessed via ReCEnT data pre- and post-intervention. The changes in GP registrars' prescribing will be compared with the changes of GP registrars of the two RTOs who are not receiving the intervention (comparator group). Analysis will employ ReCEnT data 2010-2018. Analyses will employ univariate and multivariable logistic regression within the Generalised Estimating Equation (GEE) framework to account for repeated measures within registrars. The unit of analysis will be consultations involving patients over 16 years and the outcome factor will be benzodiazepines prescribed (dichotomous yes/no). Independent variables in the model will be treatment group (intervention/comparator), time (before/after) and an interaction term of treatment group by time. The p-value of the interaction term will be used to determine statistical significance. 'Intention to treat' and 'as treated' analyses (all intervention registrars, and workshop attendees only, respectively) will be conducted.

Due to the high participation and retention rates in ReCEnT it is not anticipated that imputation will be required in the analyses.

Analysis of 'anticipated benzodiazepine prescribing behaviour' questionnaire-based evaluation (Project element 2)

McNemar's test will be used to assess changes in registrars' questionnaire responses to each clinical vignette pre- and post-intervention.

Analysis of qualitative evaluation (Project element 3)

Thematic analysis will be employed [63].

Data collection and analysis will be iterative and concurrent. Inductive thematic analysis will employ a process of constant comparison with emerging themes being identified for further exploration in subsequent interviews. Analyses will consider commonalities and differences in registrar and supervisor responses. If interviews have been conducted with both parties of a registrar-supervisor dyad, this relationship will be considered in analysis. Independent coding will be conducted by two researchers - the principle qualitative researcher (who will have conducted the interviews) and a further study investigator. Differences in researcher perspective in interpretation of the transcripts will be resolved by negotiation.

From this process of coding and negotiation a codebook will be developed. The codebook will be iteratively revised as new transcripts are analyzed. The resultant codes will be mapped and organized into second order 'themes' and named and applied to the transcripts.

Methods: Monitoring

The nature of the study is of an evaluation of a discrete educational package nested in an ongoing cohort study. Thus, interim analyses and stopping guidelines are not appropriate and a separate Data Monitoring Committee is not required.

Discussion

The evidence for most benzodiazepine prescription in general practice being inappropriate is strong. Thus, reduction of GPs' benzodiazepine prescribing rates has been a priority in Australia [64].

Despite the compelling evidence supporting reduction of benzodiazepines prescribing (both initiation and ongoing prescription), considerable barriers exist to reducing benzodiazepine prescription in general practice. These barriers are particularly problematic in the practice of early-career, less experienced, GPs and registrars. Our ReCEnT data suggests benzodiazepine prescribing by GP registrars is relatively common and does not reduce with time in training (that is, with moving from Term 1 to Term 2 to Term 3). This suggests current educational strategies in Australian GP vocational training relating to benzodiazepine prescription are not having the desired effect. In turn, this suggests current educational strategies have not overcome the identified barriers to evidence-based use of benzodiazepines in general practice.

In this study we aim to address the evidence-practice gap of abundant evidence for the harms of benzodiazepines yet common prescription of these medicines by GP registrars. We will do this via a multicomponent educational intervention that aims to decrease registrars' benzodiazepine prescribing. The intervention will include 'positive' components (providing registrars with practical non-pharmacological skills for managing anxiety, stress and insomnia) as well as commonly employed strategies that may be considered, in isolation, 'negative' (education regarding the harms of benzodiazepines).

In the proposed study we target educational interventions to early-career GPs who may be thought to be establishing prescribing behaviours likely to persist into later practice. This is also an efficient process – the intervention is delivered within the context of an existing educational program and the infrastructure to deliver the intervention already exists. The efficacy of the educational intervention will be evaluated utilizing ReCEnT study data, thereby allowing an efficient integration with a concurrent education and research project[19].

The concurrent evaluation of change in registrars' anticipated (vignette-based) benzodiazepine prescribing and actual (ReCEnT-measured) prescribing will provide insights into limitations of the translation of educational changes in knowledge and attitudes to clinical behaviours. Together with our qualitative evaluation this will facilitate iterations to the educational package in annual delivery to future GP registrar cohorts. It will also have implications for clinical educational practice more generally.

Limitations of the project

In our non-randomized trial, inferences of causality will be less strong than for an RCT. An RCT, however, is impractical for this research question. Individual RTOs will only participate if it is practicable to introduce the intervention into existing educational programs. Initially, for this educational intervention, this is only practicable for GP Synergy. We will, however, adjust for the non-randomized design with multivariable analyses. The large set of independent variables recorded in ReCEnT allows for fine-grained adjustment for confounding in these analyses. We are confident that our design is the most robust approach to the research question in the context of Australian GP vocational training and we have used this methodology previously with interventions addressing other GP registrar clinical behaviours.[44, 65]

Further implications

We will introduce an educational innovation within the singular setting of GP training and the registrar-supervisor dyad. If the intervention is successful, the multicomponent model developed for the BENEFIT study could also be used as a basis of interventions for testing in trials targeting established GPs.

Declarations

Ethics approval and consent to participate

Ethical approval for the RecEnT and BENEFIT projects has been granted by the Human Research Ethics Committee from the University of Newcastle (reference, H-2009-0323).

Consent

Benzodiazepine prescribing behaviour (Project element 1): Registrars complete ReCEnT as an integral part of their education and training program. They may choose to provide informed written consent for the data collected to also be used for research purposes.

'Benzodiazepine prescribing behaviour' questionnaire-based evaluation (Project element 2): potential participants will be provided with an appropriate Information Statement accompanying their invitation to participate. Return of a completed questionnaire will be deemed to constitute consent to participate. Participants will have the option of linking their questionnaire data to their ReCEnT data in lieu of providing demographic data within the questionnaire.

Qualitative evaluation (Project element 3): Potential participants will be provided with an appropriate Information Statement and will provide written consent.

Confidentiality

Benzodiazepine prescribing behaviour (Project element 1) and 'Anticipated benzodiazepine prescribing behaviour' questionnaire-based evaluation (Project element 2): All data is and will be de-identified with each registrar having a unique identifier number. The participant list and de-identified data will be stored in separate password-protected computer locations.

Qualitative evaluation (Project element 3): Audio recordings of interviews will be transcribed by a transcribing service, and names of participants will be replaced by numerical codes. Transcript content which might identify participants will be removed from the transcripts. The data will be stored securely on a password protected computer system.

Declaration of interests

All investigators declare no financial or other competing interests.

Access to data

The database for the study will be available to the study investigators.

Dissemination policy

Findings from the study will be communicated to participants via routine communications from their RTO, for example the GP Synergy Training Updates for registrars and supervisors.

There will be no restrictions on publication or presentation to disseminate study findings to health care professionals and the public.

There will be no use of professional writers for publications reporting study findings.

Advice from the approving ethics committee precludes making the database publicly available. Participants in the ReCEnT study have in the past not provided explicit consent for their data to be made available in this way and some of the data analyzed in this project will be of participants who have not provided that consent.

Administrative information

Protocol version

Protocol version 1, dated 1/5/18. Important protocol modifications (e.g. changes to eligibility criteria, outcomes, analyses) will be reported to relevant parties (e.g., investigators, HREC, ANZCTR, RACGP grant regulators, journals).

Trial registration

The intervention is registered in the Australian New Zealand Clinical Trials Registry (ACTRN12618000824268).

Funding

The ReCEnT cohort study in which the principle element of this project is nested was funded until 2015 by the participating educational organizations: General Practice Training Valley to Coast, the Victorian Metropolitan Alliance, General Practice Training Tasmania, Adelaide to Outback GP Training Program, and Tropical Medical Training, all of which were funded by the Australian Government. From 2016, ReCEnT is funded by an Australian Department of Health commissioned research grant and supported by the GP Synergy Regional Training Organisation.

The BENEFIT project is funded by a competitive Educational Research Grant of the Royal Australian College of General Practitioners (ERG-02). GP Synergy, the Regional Training Organisation delivering general practice education and training in New South Wales and the Australian Capital Territory, is delivering the educational intervention as part of the GP Synergy educational program.

The funders had and will have no role in study design; collection, management, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication.

Roles and responsibilities

PM is the chief investigator responsible for overall conduct of the study. PM conceived of the study. PM, SH, AD, MvD coordinated design of intervention. BB provided expertise in behavior change. SH, MvD, BB, AD, AnD, MN, AT, KF, NS provided methodological and clinical input into quantitative study design and analysis. MvD will provide oversight of qualitative study and analysis. AT is responsible for data management and conduct of in-house statistical analyses. EH is providing overall supervision of statistical analyses. MvD will provide assistance in conduct of qualitative study. KP is the overall project manager. IP and DQ are responsible for day-to-day running of the project, development of study and regulatory documents and construction of REDcap survey tools. All authors contributed to refinement of the study protocol and approved the final manuscript.

The funders had and will have no role in study design; collection, management, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication.

Composition, roles and responsibilities of the steering committee, management team, and working group

Principal investigator

Design and conduct of BENEFIT

Preparation of protocol and revisions

Preparation of study documents

Organising steering committee meetings

Managing Regulatory requirements (Ethics, ANZCTR)

Publication of study reports / papers

668 Steering committee (SC)

669 (see title page for members)

670 Agreement of final protocol

671 Recruitment of participants and liaising with RTO study sites

672 Reviewing progress of study and if necessary agreeing changes to the protocol to facilitate the smooth running of

673 the study.

674 Project management committee

675 Study planning

676 Day to day governance of project management

677 Organisation of SCMs

678 Responsible for study master file

679 Budget administration and contractual issues

680 Assistance with regulatory documents: Ethics and ANZCTR

681 Assistance with regulatory reporting (RACGP ERG reports)

682 Project working group

683 Design of educational intervention: Workshop / online module/ webinar/ Supervisor-Registrar activity

684 Development of questionnaires

685 Development of case studies

686 Selection/ development of supporting material

687 Data manager

688 Development/Maintenance of study IT system and data entry

689 Data verification

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Sources of behaviour	Intervention functions	Intervention component	Aim	Intervention component content
Capability Motivation	Education Persuasion	Pre and post workshop resources	Increase motivation and capability to reduce prescription and initiation of benzodiazepines by changing knowledge and attitudes	Background information on the harms, addictive qualities and limited value of benzodiazepines. Evidence of benefits of reduced benzodiazepine prescribing. Non-pharmacological management of anxiety and insomnia
Capability Motivation	Education Persuasion Feedback	Face-to-face workshop (addiction specialist-led	Increase motivation and capability to reduce prescription and initiation of benzodiazepines and to improve patient management of anxiety and insomnia through non-pharmacological methods by changing knowledge and encouraging reflection	Expert opinion on benzodiazepines and addiction. ReCEnT data on registrars' prescribing and initiation of benzodiazepines will be used to contextualize and reinforce practical relevance. The 'how to' of non-pharmacological management of anxiety and insomnia within the environment of everyday general practice.
Capability Motivation Opportunity	Education Persuasion Modelling Enablement Environmental restructuring	Supervisor webinar	Increase registrar capability and motivation through empowerment	Succinct overview of harms of benzodiazepines and imperative to reduce their use in the community. Provision of potential models of supervisor-registrar collaboration and reciprocity in reducing benzodiazepine prescriptions. Discussion of processes for reducing prescriptions and improving management of anxiety and

				insomnia using non-pharmacological means.
Capability Motivation Opportunity	Education Persuasion Training Modelling Enablement Environmental restructuring	Supervisor/Registrar teaching activities	Increase registrar capacity to reduce repeat prescribing of benzodiazepines and initiation of such treatment and to improve patient management of anxiety and insomnia through non-pharmacological methods, by augmenting self-efficacy. Drive opportunities to discuss and initiate deprescribing	Registrar and supervisor encouraged to review anxiety and insomnia cases, and clinical notes. Supervisor gives registrar 'license' to manage patients without recourse to benzodiazepines. Encouraged to use non-pharmacological strategies.

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