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**Behaviour change techniques in personalised care planning for older people:
systematic review**

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Behaviour change techniques in personalised care planning for older people: systematic review

Abstract

Background: Personalised care planning (PCP) interventions have potential to provide better outcomes for older people and are a key focus in primary care practice. Behaviour change techniques (BCTs) can maximise effectiveness of such interventions, but it is uncertain which BCTs are most appropriate in PCP for older adults.

Aim: To identify BCTs used in successful PCP interventions for older people aged 65+.

Design and setting: Systematic review.

Method: We searched 12 databases from date of inception to September 31st 2017. We identified randomised controlled trials (RCTs) of interventions involving participants aged 65+ and contextually related to PCP. Five areas of risk of bias were assessed. The Michie et al. BCT Taxonomy was used for coding.

Results: Twenty-three RCTs involving 6489 participants (average age 74) described PCP interventions targeting the general older adult population and older people with specific long-term conditions (e.g. heart disease, diabetes, stroke). Just over half of the studies were deemed low risk of bias. Eleven 'promising' BCTs were identified in five trials reporting significant improvements in quality of life (QoL). Six BCTs were reported in all five of these trials: 'goal setting', 'action planning', 'problem solving', 'social support', 'instructions on how to perform a behaviour' and 'information on health consequences'. Modes of delivery varied.

Conclusion: Future PCP interventions to improve QoL for people aged 65+ may benefit from focusing on six specific BCTs. Better reporting of BCTs would enhance future design and implementation of such interventions.

Keywords: older people, personalised care planning, behavioural change techniques, RCT

Background

Personalised Care Planning (PCP), defined as *'Explicitly engaging patients in a shared decision-making process involving both goal setting and action planning'*, (1) embodies core principles of 'person centredness' and 'shared decision making' embedded in the NHS for the past 20 years (2-6). The aim of PCP is to support individuals to self-manage their own health and wellbeing, typically using behaviour change techniques (BCTs) to help achieve collaborative outcomes. The PCP process enables linkage to additional mechanisms for improving outcomes, including improved care co-ordination, and better access to community resources (1, 7). Recognised key outcomes of PCP are improved physical and mental health, self-management capabilities, health-related behaviours and changes in health service use (1, 7).

In the UK, the publication of the 2018 Comprehensive Personalised Care Model (7) consolidated evidence demonstrating PCP as a promising approach to achieve change. This informed the 2019 NHS Long Term Plan, and the linked work programme to implement Personalised Care nationally. Alongside the action plan, the NHS England Ageing Well Programme specifies a multidisciplinary team approach to care for older people, defined as 'Anticipatory Care'. Both 'Personalised' and 'Anticipatory' Care were included in the draft 2020 Primary Care Network Direct Enhanced Service (PCN DES) specifications, but implementation was paused after the initial consultation period (8). Personalised care plans for people eligible for Anticipatory Care e.g. those with frailty, establish linkage across the individual specifications which are expected to form part of future contract negotiations.

The pause in implementation of the Anticipatory and Personalised Care elements of the PCN DES allows reflection on how PCP services could be optimally designed for older people. Use of BCTs to help support development of self-management capabilities is recognised as central to successful PCP. BCTs can maximise intervention effectiveness by

helping individuals achieve and sustain behaviour change (9), but the effectiveness of particular BCTs may vary across the life course and it is currently unclear which BCTs are most relevant and effective in PCP for older people. The Michie et al. BCT Taxonomy (10) identifies 93 BCTs, enabling accurate identification and replication of intervention components and classification and extraction of BCTs for the purpose of systematic reviews (11). The taxonomy has been utilised to identify BCTs most prevalent and effective for various population groups and behaviours, and can help develop interventions with a particular set of theoretical determinants underpinning behaviour (12). BCTs, used alone or in combination, map onto nine intervention functions (IFs) acting as broader mechanisms for change. Identifying IFs alongside BCTs indicates which behavioural change mechanisms might work best.

Healthcare and allied professionals are increasingly trained in and use BCTs and IFs to inform practice and interactions with clients (12).

How this fits in

Wider implementation of PCP is included in national policy, the linked NHS England Personalised Care and Ageing Well programmes, and is expected to be included in 2021/22 GP contract negotiations. BCTs are central to implementation of PCP, but are contextual and not all BCTs are appropriate for use with older people (13). Building on the current policy and operational focus on implementation of PCP for older people in primary care, this review supports the 'targeted intervention' component of the Comprehensive Personalised Care Model, by identifying six specific BCTs that have been successfully used in interventions to improve the quality of life for older people.

Aims and Objectives

The aim of the review was to identify relevant BCTs for use with older people to inform the development of the Personalised Care Planning for Older People with Frailty (PROSPER) intervention as part of a National Institute for Health Research Programme Grant for Applied Research (NIHR PGfAR) (14).

Objectives were to:

- systematically identify and describe randomised controlled trials (RCTs) evaluating PCP in older people (with or without frailty), examining health, behaviour and quality of life (QoL) outcomes.
- identify behaviour change elements in these studies exploring the potential effectiveness of BCTs in improving QoL outcomes for older people in the context of PCP.

Methods

Search strategy

This review followed PRISMA guidelines (15). A systematic search was implemented in: MEDLINE, PsycINFO, EMBASE, CINAHL, AMED, PubMed, Scopus, Applied Social Science Index, British Nursing Index, Health Technology Assessment, Cochrane central register of controlled trials, Cochrane database of systematic reviews. Databases were searched from date of inception to September 31st 2017. Search terms were developed in collaboration with an information specialist.

Eligibility criteria

This review focused on randomised controlled trials (RCTs) and cluster RCTs of interventions contextually related to PCP i.e. including 'goal setting' and 'action planning' (1). Interventions had to;

- focus on one-to-one PCP (not group education)

- incorporate active involvement of the patients in a collaborative or shared decision making process
- include collaborative 'goal setting' and 'action planning'
- include patient-based outcomes e.g. QoL and self-efficacy
- encourage patients to set their own goals or priorities and offer choices
- actively involve patients in planning treatment or care

Studies had to include participants aged 65+, or 50+ if the sample mean age was 65+.

Settings could include care homes, community and inpatient units.

Screening

All reviewers (CS, SA, GHR, AH) screened the first 40 titles and abstracts from retrieved articles to ensure consistency in applying the inclusion/exclusion criteria. The remainder of the articles were divided equally between the four reviewers. Following this, full texts of potentially eligible, relevant articles, were obtained. Full texts were divided equally between five reviewers (CS, SA, GHR, AH, MP), then screened and reasons for exclusion recorded. Papers initially selected for inclusion were screened again and consensus was reached for the final list.

Data extraction

Four reviewers extracted data (CS, SA, GHR, AH). Ten per cent of the extractions were double-checked by another member of the team. Three reviewers (CS, SA, GHR), with BCT Taxonomy coding training (2), independently coded all BCTs explicitly reported in both intervention and control conditions. Coding was reviewed by the whole team and disparities resolved by consensus. Two reviewers (AH and SA) replicated the process to code IFs. In an attempt to capture all relevant BCTs, we coded those that were definitely (++) and probably (+) present (2). We used BCT domain headings as codes where there was a lack

of information to specify a technique. Behaviour change expert, RL, provided advice and input on coding.

Using the Brown et al.. approach (16), we defined a BCT as 'promising' based on frequency (included in $\geq 25\%$ interventions) and being present in at least two *effective* interventions i.e. those which reported statistically significant differences ($p < .05$) at the latest available follow up.

Risk of bias assessment

Each reviewer assessed five areas of risk of bias using the Cochrane Collaboration Tool (17). Each entry was rated as 'low', 'high' or 'unclear' risk. Ten per cent of assessments were double-checked by a second reviewer and disagreements resolved by consensus. This assessment was not used to exclude studies or weight the findings, but to highlight where systematic error may have occurred.

Data analysis

Findings were summarised using a narrative approach.

Results

Literature search

The search identified 19,451 unique articles. Following title/abstract screening, 783 full text articles were assessed for eligibility, of which 759 were excluded. Twenty-three interventions reported in 24 articles met the criteria for inclusion (Figure 2).

Study characteristics

There were 6489 participants (mean age 74 years) across 23 studies. Eleven of the 23 studies were conducted in the US and Canada, eight in Asia, two in Europe, and two in the

UK. Most participants were female. Eleven of the studies focused on general older adult populations, six on participants with heart disease or angina, two on those with diabetes, two on stroke survivors and two on nursing home residents. Five studies focused specifically on older people with Medicare insurance. Two studies focused specifically on older people with frailty although 'frailty' was not defined.

Over half of the trials explicitly mentioned behaviour change theory (13/23), although details varied widely.

Delivery settings included; participants' homes (n=9), hospitals (n=5), at a primary care practice (n=4) and in a nursing home (n=1). Nine interventions initiated in hospital continued in community and seven were in primary care settings. Modes of intervention delivery included online, via telephone and face-to-face. Eleven interventions utilised both face-to-face and telephone delivery. Almost half of the interventions (11/23) were delivered by nurses. Other delivery agents were GPs, occupational therapists, volunteers and researchers.

The majority of interventions aimed to improve self-care or self-management of a disease. Others aimed to improve: participants' independence in their homes; their ability to carry out activities of daily living (ADLs) or engagement in therapy. Some also aimed to reduce use of health services.

For more detailed information on study characteristics see Table S1.

Risk of bias assessment

Twelve of 23 studies scored low on the majority of the risk of bias criteria. Generally, there was insufficient information on method of randomisation, allocation concealment and

blinding, but a high risk of bias on 'Blinding of participants and personnel' (17) was observed. The Red, Amber, Green assessment of risk for each of the criterion is shown in Table S2.

Findings

Seventeen of the 23 studies reported statistically significant findings in one or more outcome measure. There were significant findings relating to mortality and disease-specific outcomes in five studies (18-22). Five studies demonstrated significant improvements in mental health outcomes (23-27). Five also showed significant improvements in behavioural outcomes such as physical activity or attendance at fitness classes (28-32) and three for quality of life outcomes (20, 25, 31).

Behaviour Change Techniques

Intervention groups

Forty-seven of the 93 BCTs in the Taxonomy were reported in the intervention groups. Table S3 summarises the BCTs used in intervention and control groups.

Control groups

Twelve BCTs were identified in the control groups, with the most common ones being 'social support' (practical), 'information about health consequences', 'credible source' and 'pharmacological support'.

Intervention functions

Six of the nine IFs were coded. Table 1 shows 'persuasion' coded for all interventions. 'Enablement' and 'education' were also prevalent. Most studies satisfied more than one IF. The mean number of IFs per study was three. 'Incentivisation', 'coercion' and 'restriction' were not coded. For more detailed intervention descriptions, including significance see Table S4.

Promising Behaviour Change Techniques in trials reporting quality of life outcomes

There were 11 trials which included QoL as an outcome. Of these, five trials reported significant improvements for QoL, either between groups (20, 23, 25, 31) or within groups over time (22). From these five trials, we identified 11 'promising' BCTs.

Of the 11 'promising' BCTs, six were present in all five of the trials. Examples of all 11 BCTs are shown in Table 2.

Discussion

Summary

We identified 23 trials involving 6489 participants which used BCTs in the context of PCP interventions with older people. Interventions differed in terms of setting, mode of delivery, intervention provider and reported outcomes.

Eleven 'promising' BCTs were identified; six were included in all five studies where QoL improved - 'goal setting', 'action planning', 'problem solving', 'social support', 'instructions on how to perform a behaviour' and 'information on health consequences'. 'Goal setting' divided into 'goal setting (behaviour)' and 'goal setting (outcome)', aligned with the BCT Taxonomy.

'Unspecified social support' was also identified as a promising BCT, typically including advice, encouragement or coaching as opposed to 'emotional social support' which was rarely identified. This could be a function of interventions being delivered by healthcare professionals (HCP) who have additional responsibilities and thus less available time to implement the 'emotional social support' BCT. Alternatively, 'emotional social support' may

not have been explicitly mentioned where it is perceived as a naturalised component of a HCPs role (33).

Many interventions provided some form of lifestyle information or education. We assumed that education provision would involve at least two BCTs; 'information about health consequences' and 'instruction on how to perform a behaviour' (9).

BCTs were also coded in the control groups, which mostly comprised usual care. There was some overlap between the BCTs in usual care and intervention arms with some BCTs e.g. 'pharmacological support' or 'credible source' being considered part of usual care.

The majority of interventions were delivered face-to-face or via telephone and face-to-face. Face-to-face delivery seemed the most acceptable mode of delivery for an older population. However, one of the significant QoL interventions was web-based. Others had elements of telephone follow-up. Flexibility in delivery mode may be useful during the current COVID19 context and emerging new ways of working.

Strengths and limitations

This review focuses on BCTs within PCP interventions specifically for older adults (aged 65 and over). The findings add value to the self-management approach outlined in the CPC Model as they pertain to the specific needs of older adults who fall within the 30% of the population with long-term physical or mental health conditions (including frailty) who need targeted interventions. They can be easily adopted by health and social care professionals working with this population to enhance existing health coaching skills. We anticipate that review findings will be especially useful in any future implementation of Personalised and Anticipatory Care. The focus on BCTs that improve quality of life in older age is aligned with the growing recognition of this as an important outcome for older people.

The review has limitations. All interventions used multiple BCTs, but it was not possible to assess the impact of individual BCTs on outcomes. We attempted to mitigate this by focusing on BCTs which occurred in all five studies with significant improvements in QoL.

The heterogeneity of interventions precluded meta-analysis and lack of follow-up data meant we were unable to assess long-term effectiveness. Assessing risk of bias was also problematic as un-blinding of participants and delivery staff is almost inevitable in PCP.

We only included RCTs in this review as we wanted to examine BCTs that had been utilised and tested for effectiveness and acceptability using the same design as our own intervention evaluation. Although this potentially missed studies including alternative BCTs, the robust evaluation design increases confidence in review findings.

Comparison with existing literature

We used the pragmatic assumptions of Brown et al. (16) to define 'promising' BCTs enabling us to focus the BCT Taxonomy (10) and identify BCTs that are most useful for use in PCP for older people. This is particularly important as techniques appropriate for younger adults may not be effective for older adults (13).

Implications for research and practice

Consistent use of the BCT taxonomy when reporting interventions in research studies would enable researchers to identify specific BCTs for use with specific target populations. More widespread inclusion of mediation analysis in RCTs of PCP interventions in older age would help inform which individual BCTs are most effective.

The review findings are especially relevant for the current English primary care context, as they can be used to inform operational implementation of the proposed PCN DES Personalised and Anticipatory care service specifications.

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Ethical approval

This study was approved by Bradford Leeds Research Ethics Committee 18/10/2018 (18/YH/0294).

Competing interests

The authors have no financial/non-financial, personal or non-personal competing interests.

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Figure 1 BCT within the CPC model

Figure 2: PRISMA flow-diagram

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INTERVENTIONS

OUTCOMES

Specialist (5%)

Targeted (for older adults with LTC inc. frailty (30%))

Universal (100%)

Health coaching

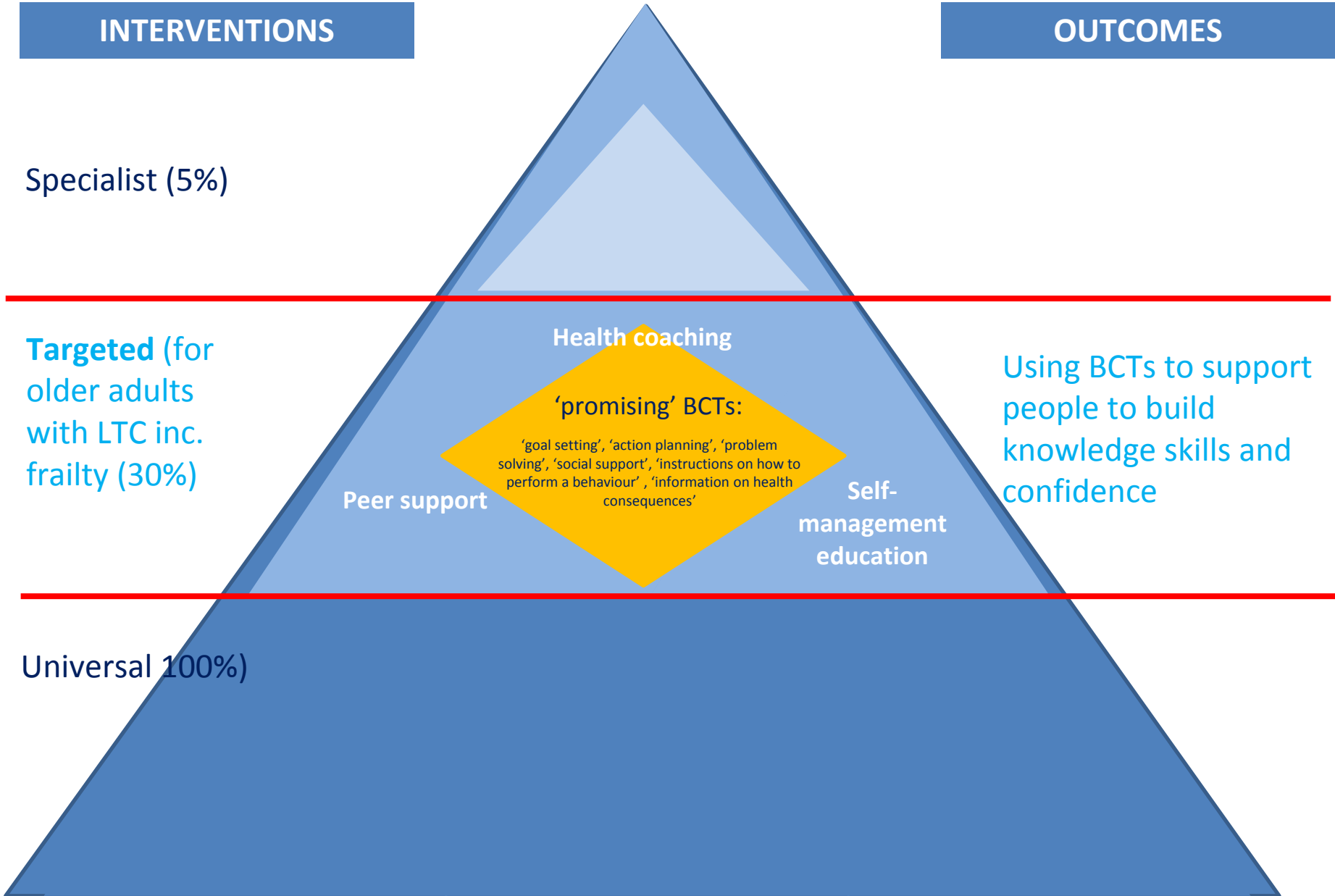
'promising' BCTs:

'goal setting', 'action planning', 'problem solving', 'social support', 'instructions on how to perform a behaviour', 'information on health consequences'

Peer support

Self-management education

Using BCTs to support people to build knowledge skills and confidence



Identification

Records identified through database searching
(n = 25,220)

Additional records identified through other sources
(n = 0)

Screening

Records after duplicates removed
(n = 19,451)

Records screened
(n = 19,451)

Records excluded
(n = 18,668)

Eligibility

Full-text articles assessed for eligibility
(n = 783)

Full-text articles excluded with reasons
(n = 759)

- Not a personalised care plan (n = 295)
- Not a randomised controlled trial (n = 74)
- Sample not suitable (n = 310)
- Other (n = 80)

Included

Studies included in synthesis
(n = 23 **studies**, (24 papers))

Table 1: Frequency of intervention functions

Intervention Functions	Frequency of Use
Persuasion	23
Enablement	17
Education	17
Training	9
Environmental Restructuring	7
Modelling	3

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Table 2: Promising Behaviour Change Techniques

	Behaviour Change Technique	Example	Interventions (n)	Controls (n)
1.4	Action planning	Agreeing to eat three light meals a day with at least one hot meal. Action planning needs to include thought around when, where and how the behaviour will take place.	23	0
1.3	Goal setting (outcome)	Goals generally need to be Specific Measurable Achievable Relevant and Time bound (SMART) and the result of shared decisions. For example, getting to the shops and home on my own.	21	0
3.1	Social support (unspecified)	Getting a 'blue badge' to allow the person to go to the shops alone.	21	2
1.2	Problem solving	Working to identify the barriers preventing individuals from engaging in behaviours and identifying 'enablers'. For example not being able to get to a social group due to lack of transport; problem solving should address how they might access the group.	19	0
5.1	Information about health consequences	General education: information about the benefits of drinking enough water (hydration), or dis-benefits of consumption of sugary foods if they have diabetes.	19	6
9.1	Credible source	Using information from a well-known and respected source e.g. British Heart Foundation chair based exercises.	15	4

11.1	Pharmacological support	Using pharmacologic, including appetite-stimulating, to improve appetite in patients with weight loss.	14	4
4.1	Instruction on how to perform the behaviour	Advising how to use on-line services from the Council.	13	1
15.1	Verbal persuasion about capability	Focusing on an individual's abilities and assets, and providing verbal encouragement.	12	0
1.7	Review outcome goals	Checking if goals have been achieved and exploring barriers to achievement.	9	0
2.6	Biofeedback	Breathing exercises and monitoring with spirometer.	4	0

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