

Do people with existing chronic conditions benefit from telephone coaching? A rapid review

Sarah M. Dennis^{1,2} MSc, PhD, Senior Research Fellow

*Mark Harris*¹ MBBS, MD, FRACGP, Executive Director

*Jane Lloyd*¹ BAppSc, MPH, PhD, Research Fellow

*Gawaine Powell Davies*¹ MHP, Director, CEO

*Nighat Faruqi*¹ MBBS, MCommChildHealth, PhD, Research Assistant

*Nicholas Zwar*¹ MBBS, PhD, FRACGP, Director, Professor of General Practice

¹Centre for Primary Health Care and Equity, University of New South Wales, Sydney, NSW 2052, Australia.

Emails: m.f.harris@unsw.edu.au; j.lloyd@unsw.edu.au; g.powell-davies@unsw.edu.au; aarfufu@hotmail.com; n.zwar@unsw.edu.au

²Corresponding author. Email: s.dennis@unsw.edu.au

Abstract

Objective. To examine the effectiveness of telephone-based coaching services for the management of patients with chronic diseases.

Methods. A rapid scoping review of the published peer reviewed literature, using Medline, Embase, CINAHL, PsychNet and Scopus. We included studies involving people aged 18 years or over with one or more of the following chronic conditions: type 2 diabetes, congestive cardiac failure, coronary artery disease, chronic obstructive pulmonary disease and hypertension. Patients were identified as having multi-morbidity if they had an index chronic condition plus one or more other chronic condition. To be included in this review, the telephone coaching had to involve two-way conversations by telephone or video phone between a patient and a provider. Behaviour change, goal setting and empowerment are essential features of coaching.

Results. The review found 1756 papers, which was reduced to 30 after screening and relevance checks. Most coaching services were planned, as opposed to reactive, and targeted patients with complex needs who had one or more chronic disease. Several studies reported improvements in health behaviour, self-efficacy, health status and satisfaction with the service. More than one-third of the papers targeted vulnerable people and telephone coaching was found to be effective for these people.

Conclusions. Telephone coaching for people with chronic conditions can improve health behaviour, self-efficacy and health status. This is especially true for vulnerable populations who had difficulty accessing health services. There is less evidence for improvements in quality of life and patient satisfaction with the service. The evidence for improvements in health service use was limited. This rapid scoping review found that telephone-based coaching can enhance the management of chronic disease, especially for vulnerable groups. Further work is needed to identify what models of telephone coaching are most effective according to patients' level of risk and co-morbidity.

What is known about the topic? With the increasing prevalence of chronic diseases more demands are being made of limited health services and resources. Telephone health coaching for people with or at risk of chronic diseases is seen as a means of supporting people to manage their health and reducing the burden on the healthcare system.

What does this paper add? Telephone coaching interventions were effective for vulnerable people with chronic disease (s). Often the vulnerable populations had worse control of their chronic condition at baseline and demonstrated the greatest improvement compared with those with better control at baseline. Planned (i.e. weekly or monthly telephone calls to support the patients with chronic disease) and unscripted telephone coaching interventions appear to be most effective for improving self-management skills in people from vulnerable groups: the planned telephone coaching services had the advantage of regular contact and helping people develop their skills over time, whereas the unscripted aspect allowed the coach to tailor support to the patient's individual needs

What are the implications for practitioners? Telephone coaching is an effective means of supporting people with chronic diseases to manage their own health. Further work is needed to embed telephone coaching within existing services. Good linkages with the patient's general practitioner are important. This might be a regular report, updates via the patient e-health record, or provision for contact if a problem is identified or linking to the patient e-health record.

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Introduction

The prevalence of chronic diseases is rising, which places an increasing burden on the community and the health system.¹ In addition to rising rates of individual chronic diseases, there has been an increase in rates of co-morbidities. Many Australians suffer from multi-morbidity, where multiple long-term conditions occur but no single condition is the index condition. For example, 55% of those over 65 suffer from five or more long-term conditions,² and rates of multi-morbidity are increasing.³ The prevalence of chronic disease is not spread equitably. Vulnerable populations such as Aboriginal and Torres Strait Islander (ATSI) people and people who are socioeconomically disadvantaged suffer a greater burden of disease and are less likely to engage with the healthcare system.

These increased rates of individual chronic disease and multi-morbidity coupled with the inequitable distribution of disease and inequitable access to health services provide enormous challenges to the healthcare system. Self-management (SM) has been seen as a solution to reduce the burden of chronic disease on the healthcare system. The National Chronic Disease Strategy defines SM as the active participation of the patient in their own healthcare.⁴ Behaviour change, goal setting and empowerment are essential features of SM and coaching.^{5,6} SM support is provided by healthcare professionals and equips patients with the skills and confidence they need to manage their health.⁷ Engaging health professionals and patients in SM programs has proved challenging.^{8,9} This challenge is further compounded by workforce shortages in Australia,^{10,11} especially in the primary care sector.¹¹ New ways of providing healthcare and support to people with chronic conditions are needed. Telephone coaching aims to address some of these issues by providing additional services to people with chronic diseases. A recent systematic review of telephone coaching for people with long-term conditions found that telephone coaching was becoming increasingly popular and most studies reported positive outcomes, although the description of the interventions was inadequate.¹² However, an evaluation of the Medicare Health Support Pilot Program in the USA found that telephone support by nurses did not reduce admissions or emergency department attendance and there were only modest improvements in processes of care such as blood tests for glycosylated haemoglobin (HbA1c) and lipids, eye examinations or testing for urinary protein.¹³

This rapid review examines the effectiveness of telephonic-based coaching services for the management of patients with one or more chronic diseases in terms of health and process of care outcomes, quality of life and health service use. What are the models of telephone coaching that are most effective and for whom—those with multi-morbidities, single morbidities and vulnerable populations?.

Methods

We conducted a rapid systematic review of published peer-reviewed literature, using Medline, Embase, CINAHL, PsychNet and Scopus. We used initial searches to identify key MESH terms relating to telephone coaching, and adapted terms for research design from previous systematic reviews.^{14–16} The MESH terms used in Medline, which were modified for use in the other databases, are listed in Table 1.

Table 1. Key MESH terms for Medline search strategy

Telephone coaching MESH terms	Study design terms
Telemedicine	Randomised controlled trial
Telephone	Controlled clinical trial
Patient education as a topic	Intervention studies
Self-care	Random allocation
Motivation	Evaluation studies
Health behaviour	Comparative studies
Social support	

We included studies involving people aged 18 years or over and living in the community, with one or more of the following chronic conditions: type 2 diabetes mellitus (T2DM), congestive cardiac failure, coronary artery disease, chronic obstructive pulmonary disease (COPD) and hypertension. Patients were identified as having multi-morbidity if they had more than one index condition or one of these plus another chronic condition, for example frailty, mental health or geriatric syndromes. Vulnerable populations included ATSI people, those from culturally and linguistically diverse backgrounds, low socioeconomic status and those living in rural and remote areas. Studies were included if they involved the carers of people with chronic disease as a proxy for the person with chronic disease rather than for their own needs as carers.

To be included in this rapid review, the telephone coaching had to involve two-way conversations by telephone or video phone (e.g. Skype) between a patient and a provider (including trained lay people). Behaviour change, goal setting and empowerment are essential features of coaching. We adopted Linder's definition of coaching:¹⁷

A method of patient education that guides and prompts a patient to be an active participant in behaviour change. Coaching involves an interactive approach with the patient that helps to identify impediments to behaviour change, and methods of teaching and modelling behaviour that empower the patient to achieve and maintain improved health status.^[18] Goal setting and empowerment are important features.^[5,6]

There was no minimum number of sessions required for the coaching to be included.

Studies were included if the research was from Australia, New Zealand, Canada, Europe or the USA, were written in English and were published between 1 January 2001 and 28 October 2011. Studies were excluded where:

- coaching was for primary prevention (for people at risk of a chronic disease but without a diagnosis),
- the telephone coaching was a relatively minor adjunct to a face-to-face intervention such as a non-coaching SM program or home visit program,
- the telephone intervention did not involve a two-way conversation between a patient and a provider using a method such as SMS or automated services,
- the intervention was internet or web based only, or
- the intervention involved telemedicine or remote disease monitoring only.

Conceptual framework and narrative synthesis

The Kaiser Permanente Risk Pyramid (KPRP) was used to group the included papers according to the description of the included study populations and the level of care they required. The risk levels were modified to provide guidelines for the reviewers to categorise the study (see Table 2) and patients who were at level 1 or above were selected for the review. The levels of risk and associated descriptions were used to categorise the studies according to the complexity of the patients included and not the descriptions of the telephone coaching interventions. For example, many of the studies that included heart failure patients were categorised as level 3 because patients were recruited into the study following a hospital admission for an exacerbation of an index condition.

In the process of the review we developed a classification of telephone coaching services, based on an analysis of the studies rather than an *a priori* theoretical framework. The classification has two dimensions: scripted *v.* unscripted and planned *v.* reactive, as described in Table 3. We also identified common components of coaching interventions: information and education, motivation and goal setting, monitoring, SM skills, duration of the coaching relationship (including number of calls), and referral to usual healthcare provider.

We used a vote counting system to determine the effectiveness of the interventions for the model of coaching and level of care. The numerator is the number of studies reporting a significant change in favour of the intervention and the denominator is the number of studies reporting that particular outcome.^{19,20} Any significant change that is not in favour of the coaching intervention was noted and reported.

Results

The searches identified 1756 papers, which reduced to 1026 after duplicates and papers not relevant to the research questions

were removed. Two people (SD, NF) reviewed approximately half the papers each and a 20% overlapping sample of the excluded papers was reviewed by a third reviewer (JL). There were 164 papers remaining after this stage. Another duplicate and a conference abstract were removed, and full copies of the papers obtained for the 162 remaining papers. Papers were verified for inclusion (around 27 per review team member) using a checklist (Appendix S1, available online as supplementary material to this paper), leaving 73 papers for data extraction. A further 29 papers were failed to meet the inclusion criteria, leaving 44 papers reporting on 30 interventions.

Most (24/30) of the studies were undertaken in the USA, followed by Australia (2/30) and the UK (2/30) with one each from Norway and Canada. The included chronic diseases were T2DM (10/30), heart failure (8/30), coronary artery disease (6/30) and hypertension (5/30). Only one study directly targeted patients with multi-morbidity.²¹ There were four studies where many of the patients had an index chronic condition such as T2DM^{22–27} or heart failure²⁸ and several co-morbidities, but the coaching intervention only targeted the index chronic condition.

Design of the telephone coaching intervention

Most coaching was planned coaching (i.e. weekly or monthly telephone calls to support the patients with chronic disease; $n = 25$) and only five studies described reactive coaching (see Table 4).^{21,29–40} Reactive coaching (responding to data uploaded by participants) tended to focus on patients categorised as being at level 2 who were engaged in active disease management such as symptom monitoring and SM. The majority of the telephone coaching interventions ($n = 23$) targeted patients categorised as being at level 2 or level 3 of the KPRP, i.e. more complex patients with one or more chronic disease.

The components of the telephone coaching intervention and linkages between the coaching and the patients' usual providers

Table 2. Kaiser levels of risk

Kaiser level of risk	Description of characteristics of patients at this level
Level 3 Very high risk	People with complex or multi-conditions recruited following hospital or emergency department discharge. The intervention is often intensive and designed to prevent hospital re-admission. There may be a case manager for the patients.
Level 2 High risk	People with chronic condition(s) where the focus of the intervention is on active management of the condition. This may involve a multidisciplinary team. Participants are usually recruited from primary care or the community.
Level 1 Moderate risk	People with chronic condition(s) where the focus of the intervention is mainly secondary prevention such as lifestyle risk factor management. Participants are recruited from primary care or the community.

Table 3. Classification for telephone coaching

Model of telephone coaching	Description
Scripted	Coaching is part of proactive management that follows a structured script or computer algorithm (agreed protocols and pathways for managing specific disease).
Unscripted	Coaching takes a patient-centred approach that is not scripted but may still be informed by disease guidelines or protocol allowing for clinical judgement and participant goals.
Planned	Coaching services where regular telephone calls are scheduled.
Reactive	The person delivering the telephone coaching has been prompted to do so in response to clinical monitoring data, e.g. BP readings or blood sugar readings from a patient uploaded to the service or transmitted automatically.

were explored using the extracted data. Patients categorised as being at level 1 were more likely to be offered SM skills (7/7) and assistance with motivation and goal setting (4/7) than standard information and monitoring (4/7), and this was less likely to be scripted. Patients at level 2 were as likely to receive information and education (11/13) as they were to receive coaching skills in SM (11/13) and this was more likely to be scripted. This suggests that in addition to a patient-centred approach there is also a need for standard education and information about their condition(s). The complex patients at level 3 were more likely to receive education, SM support and disease monitoring as part of the intervention. Across all levels of complexity the coaching also addressed compliance both in terms of medication use and with behavioural goals or routine checks such as weight or foot checks, although only 11/30 studies reported outcomes for compliance.

Linkages between telephone coaching and usual providers (e.g. general practitioner)

There were few linkages to usual primary care providers (PCPs). Overall, 14 studies reported some linkage with PCPs, mostly for patients at level 2 (8/13) and level 3 (4/10) rather than level 1 (2/7). The types of linkages included regular reports to the patient’s usual general practitioner (GP),^{28,36,41-43} and contacting the usual primary healthcare provider when medical problems required intervention such as medication changes.^{33,43-46}

Improvements in behaviour, self-efficacy and health status

The outcomes for all studies are reported in Table 5. Overall the majority of studies measuring these outcomes reported statisti-

cally significant improvements in health behaviour, self-efficacy, health status and satisfaction with the service. The evidence for improvements in health service use was limited and in the Informatics for Diabetes and Education Telemedicine (IDEATel) study the coaching increased the use of health services.^{33,34} There was also little evidence of improvement in quality of life. Health behaviours were more likely to improve in patients receiving planned or scripted coaching. Only one⁴⁶ of seven studies using planned coaching reported improvements in adherence compared with 4/4 using reactive coaching.^{21,33,35,38-40}

Vulnerable populations

Of the 30 interventions included in the rapid review, more than a third (n = 12) targeted vulnerable groups. However, interestingly none of these targeted Indigenous populations in Australia, the USA or Canada. The majority of studies (n = 9) were from the USA,^{22-24,29,30,33,34,36-39,41,43,47-51} two were from Australia^{25-27,52,53} and one was from the UK.^{31,40} Of the 12 interventions that targeted vulnerable groups, almost all (n = 11) of the telephone calls were planned,^{22-25,27,31,40,41,43,47-49,51-53} rather than reactive^{29-31,33,34,36-40,50} (see Table 6). In addition, the majority of these planned calls (n = 8) involved unscripted conversations.^{24-27,47,51-53} It seems plausible that interventions that focus on vulnerable groups would need a greater degree of flexibility in order to focus on the patients’ priorities and motivations, their readiness for change and improving SM skills. Scripted calls would be more likely to simply provide information and education.

Telephone coaching proved to be effective for vulnerable groups (see Table 7). The effectiveness may reflect the ‘inverse

Table 4. Models of telephone coaching according to level of disease management (study counts)
A study may be reported in more than one paper

	Scripted		Unscripted		Total
	Planned	Reactive	Planned	Reactive	
Level 1	3 ^{41,49,55,60}	0	4 ^{47,51,53,59}	0	7
Level 2	6 ^{22,23,28,42,44,46,61}	2 ^{A29-31,33,34,36-40,50}	3 ^{24-27,52,62}	2 ^{32,35}	13
Level 3	5 ^{43,45,63-65}	0	4 ^{48,58,66,67}	1 ²¹	10
Total	14	2	11	3	30

^AOne was reactive and planned.

Table 5. Effectiveness of the telephone coaching models for all models of care

	Scripted		Unscripted		Total (n = 30)
	Planned (n = 15)	Reactive (n = 1)	Planned (n = 11)	Reactive (n = 3)	
Physiological measures of disease	4/7	2/2	1/5	1/1	8/15
Health behaviour	7/8	1/2	3/5	0/1	11/16
QoL	1/5	1/1	0/1	0	2/7
Adherence	1/7	2/2	0	2/2	5/11
Self-efficacy	1/1	1/1	1/2	0	3/4
Health status (including depression)	1/2	1/1	3/6	0	5/9
Functional status	0/1	0	1/1	0	1/2
Satisfaction with telephone coaching	1/2	1/2	2/2	1/1	5/7
Health service use	0/6	0/1 ^A	1/1	1/1	2/9

^AHealth service use higher with intervention.

care law' where those with the greatest need are less likely to receive services and less likely to adhere to medication or checks. If telephone coaching provides greater access to services to a group with high needs then improvements in health outcomes and behaviour are likely to result. (Summary details of all included studies can be found as an accessory publication to this paper online.)

Important components of telephone coaching

It is not clear what is the appropriate number of telephone calls in a telephone coaching intervention, the appropriate duration of the intervention and whether a maintenance phase is required. In the pro-active call centre treatment support (PACCTS) trial in the UK,^{31,40} acceptability was measured by a purposely designed questionnaire and was administered to the intervention group after the patient had received at least three proactive calls. Ninety percent of participants agreed that PACCTS was an acceptable intervention. Factors that made the service acceptable related to friendliness, helpfulness, convenient call scheduling and duration, knowledgeable staff, personally relevant call content and useful personally tailored advice. However it is also important to note that in the same study 8.2% of the patients in the intervention arm of the trial left the study: their stated reasons were that they could not cope with the number of telephone calls. However, this may reflect deeper issues, such as having other more pressing priorities or the intervention not addressing the participants' needs, rather than simply the number of telephone calls.

Discussion

Most of the studies described telephone coaching for one particular chronic condition and only one study included people with multi-morbidity. Because of this we have chosen to use the

levels of risk in the KPRP to frame our results and to highlight differences in the interventions as patients become more complex in their healthcare needs. Planned and scripted telephone coaching models seem to be more effective for patients at moderate risk (level 1). The planned and scripted calls had a focus on SM and motivational interviewing and there were improvements in physiological measures of disease and health behaviour. Scripted models of telephone coaching services are more effective in providing health education, i.e. increasing knowledge but not necessarily changing behaviour. This is presumably because the scripted nature increases the likelihood that the intended content will be delivered. This model is appropriate where the aim is primarily to provide information and increase knowledge and education. For patients at level 2 and 3 the emphasis of the coaching models seems to shift more to SM and monitoring of chronic disease. Reactive telephone coaching tended to be targeted at the more complex patients and seems to be effective for level 2 patients to improve their physiological measures of diseases, such as blood pressure (BP) or HbA1c. The benefits of reactive telephone coaching are less clear for more complex patients at level 3. Telephone coaching overall did not improve patient adherence to treatment. There were insufficient data to explore the effectiveness of telephone coaching for people with multi-morbidity.

Telephone coaching interventions seemed to be more effective for vulnerable people with chronic conditions. Often the vulnerable populations had worse control of their chronic condition at baseline and demonstrated the greatest improvement compared with those with better control at baseline. Planned and unscripted telephone coaching interventions appear to be most effective for improving SM skills in people from vulnerable groups. The planned telephone coaching services have the advantage of regular contact and helping people progress skills over time. The unscripted aspect allows the coach to tailor support to the individual patients' needs and appears to be appropriate for people from vulnerable populations. Telephone coaching services can be designed to address problems of access in vulnerable populations or problems of capacity or suitability of available services such as primary care services. To be successful, such telephone coaching models need to clearly identify the nature of the need in the target population and design services to address these needs. This at times requires providing services that go beyond telephone coaching alone, reinforcing the need for an

Table 6. Models of telephone coaching for vulnerable people (study counts)

Note: a study may be reported in more than one paper

	Scripted	Unscripted	Total
Planned	3 ^{22,23,43,49}	8 ^{23-27,48,51-53}	11
Reactive	1 ^{29,31,33,34,36-40,50}	0	1
Total	4	8	12

Table 7. Effectiveness of interventions that target vulnerable groups

Measures of effectiveness	Studies reporting significant improvements	Examples
Physiological measures of disease	4/7	Improvements in HbA1c
Health behaviour	5/6	Improvement in diet and exercise
Adherence	4/5	Medication use increase. More uploads resulted in greater reduction in HbA1c
Satisfaction	4/4	Found it convenient and improved their problem solving skills
Access	2/2	Acceptability
Quality of life	2/2	
Health service use	1/1	Higher Medicare claims
Self-efficacy	0/1	
Health status	0/1	

unscripted approach. The challenge is to encourage vulnerable people to take up the offer of telephone coaching although recent data from the evaluation of the NSW Get Healthy Service suggest that vulnerable people will access telephone coaching services for disease prevention.⁵⁴

The impact of telephone coaching on health service use is unclear. Overall, telephone coaching did not significantly reduce health service use^{21,41,43,55} and in some, health service use was increased with the intervention.^{33,34} The increase in health service use was reported in the IDEATel study where there were higher Medicare claims and more referrals to other health providers for those in the intervention group.^{33,34} Some of this increase in health service use may be related to improved quality of care because the patient's usual PCP was notified about scheduled tasks such as HbA1c or podiatry and ~23% of nurse calls resulted in a need to contact patients' providers.³³ When the cost of providing the intervention is included the costs can be greater for the intervention group.^{44,55} These findings are reinforced by the results of the Medicare Health Support Pilot Program, where there was no reduction in health service use with telephone coaching.¹³ The programs in that study recruited patients whose Medicare claims were 35% larger than the population average and the companies providing the coaching were aiming to offset the costs of providing the coaching with the cost savings from a reduction in hospital admission. Only one of the companies managed to significantly reduce hospital admissions. A review of the literature of the cost effectiveness of telephone disease management programs (DMPs) in the USA found that only those targeting heart failure seemed to offer cost savings⁵⁶ although most of these involved structured remote monitoring or telemonitoring, as opposed to coaching of people with heart failure. A Cochrane review of telemonitoring and telephone support reported a modest reduction in all-cause hospital admission (OR 0.92 95% CI 0.85, 0.99) and heart failure-related admission (OR 0.77 95% CI 0.68, 0.87) although the included studies tended to offer telephone support as opposed to coaching.⁵⁷

Most of the telephone coaching models identified had a focus on the management of one chronic condition. Further research is needed to determine the effectiveness of a more generic telephone coaching service for patients trying to manage multi-morbidity and what model of telephone coaching would be most appropriate. Further research is required to identify the effectiveness of telephone coaching for ATSI Australians, people with low levels of health literacy, refugees, people living in rural and remote areas and people with intellectual or physical disability.

There were 13 studies that described linkages with the patients' PCPs such as information sharing, alerts that further medical attention may be required or regular reports on progress. There was not enough information to determine whether the presence of these linkages was associated with better outcomes for the patients, although nine of the studies did report an improvement in at least one outcome measure. Only one of the studies that described linkages between PCPs and the telephone coaching reported an improvement in hospital admission for heart failure.⁵⁸ The linkages included guidelines for the nurses and the patients telling them when to contact their physician. There was an example of a negative impact of linkages: the PACCTS study used information from the patients' e-health records to trigger telephone calls.⁴⁰ Patients would visit their GP

and have HbA1c tests and if the results were above 9% they received a monthly call and this reduced to three monthly if HbA1c was 7%. Patients may not have been aware that this information had triggered the telephone calls and 8.2% withdrew because they could not cope with the calls. Reactive coaching may be less bothersome if patients upload their own data and then they are aware that if they have a high reading it will trigger a call, as was the case in the IDEATel study. McCall¹³ suggested that poor linkages had had a negative impact on the success of the programs in the USA. Further research is needed to determine the importance of good linkages between the program and PCPs.

Limitations of the review

The initial timescale and deadline for delivery of the literature search meant that the list of search terms was truncated. The search terms combined three groups: telephone interventions, health coaching and motivational interviewing and terms for study design. The reference lists of the included studies were not searched to identify further studies. This means that some papers inevitably will have been missed. For example the Cochrane review of telephone support for patients with heart failure⁵⁷ did not list MESH terms for patient education, self-care or terms related to motivational interviewing, and was not identified in the search strategy. This review, for example, identified more than 8000 papers, which would have been impossible for the team to screen in one week. A decision was made during the early scoping of the literature to exclude some of the text word searches to decrease the specificity and sensitivity of the search.

The experimental literature contained few details of barriers and facilitators to effective telephone coaching or detailed information about implementation and reach. This type of information may be available in descriptive or qualitative research papers or evaluation reports and would require a different database and website literature search.

More research is needed to understand and inform the most appropriate approach for people with multi-morbidities. More research is needed to understand whether telephone coaching might be effective for ATSI people and what model of coaching might be most appropriate.

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