Health coaches – do they work and what for?

Background

Health coaching is motivational coaching to inform and support service users or patients wishing to make lifestyle changes in order to improve health outcomes and prevent long term conditions, such as heart disease and diabetes, or to manage those conditions once they have occurred.

Health coaches can provide information and/or encourage behaviour change. They can address multiple health risks simultaneously.

Health coaching is closely related to 'life coaching' for health, 'mentoring' and 'motivational interviewing' in the promotion and encouragement of effective self management of long term health conditions. Health coaching can take place in person, by telephone or via the internet.

The effectiveness of health coaching may vary according to the health condition being addressed, the methods being used by the health coach and the level of need of the recipient. Those in the greatest need will generally gain the greatest benefit from the intervention.

Summary and key findings

- Evidence of the effectiveness of health coaching is mixed.
- There is widespread and robust evidence of the effectiveness of motivational interviewing (MI) as a health coaching technique.
  (Bennett J A, Butterworth, Linden, Lundahl, Pringle, Rubak)
- Evidence is weak that telephone based health coaching is effective in achieving health goals and there is little or no evidence that it is effective in reducing health service usage or costs.
  (Blackberry, Dennis, Härter, Hayashi, Hutchison, Lawson, Lin, O'Hara, Steventon, Verof, Wolever)
- There is evidence that health coaching, including web based systems, can be effective in combating obesity.
  (Anttwi, Bennett G G, Kosey, Merrill, Moore, Nishita, O'Hara)
- There is evidence that health coaching can be effective in managing diabetes, heart conditions, lifestyle choices and mental health conditions.
  (Allen, Bray, Edelman, Gilstrap, Howard-Jones, Kosey, Lawson, Moore, Nishita, O'Hara, Olsen, Selvaraj, Sieber, Thom, Vale, Wolever)
- There is no evidence (in this review) that mentoring is effective in combating social isolation in older age and is of limited effectiveness with youth.
  (Dickens, DuBois)

- As might be expected, recipients with the greatest need receive the greatest advantage from health coaching. (Dennis, Gilstrap, Jordan, Kosey, Merrill)

Review of evidence

Study	Methods	Findings
Allen J K, Nison-Himmelfarb C R, Szanton S L, Bone L, Hill M N, Levine D M, West M, Barlow A, Lewis-Boyer L, Donnelly-Strozzo M, Curtis C and Anderson K (2011) Community Outreach and Cardiovascular Health (COACH) Trial: a randomized, controlled trial of nurse practitioner/community health worker cardiovascular disease risk reduction in urban community health centers, *Circulation: Cardiovascular Quality and Outcomes* 4 (6) : 595-602	RCT of 525 patients with cardiovascular disease, type 2 diabetes, hypercholesterolemia or hypertension and levels of LDL cholesterol, blood pressure or HbA1c above national guideline levels. Assigned to nurse practitioner/community health worker teams (NP/CHW, n=261) or enhanced usual care (EUC, n=264) The sample was predominantly female (71%) and black (79%).	Compared with EUC, patients in the NP/CHW group had significantly greater 12-month improvement in total cholesterol (difference, 19.7 mg/dL), LDL cholesterol (difference,15.9 mg/dL), triglycerides (difference, 16.3 mg/dL), systolic blood pressure (difference, 6.2 mm Hg), diastolic blood pressure (difference, 3.1 mm Hg), HbA1c (difference, 0.5%), and perceptions of the quality of their chronic illness care (difference, 1.2 points). Conclusion: Nurse practitioner / community health worker interventions can improve risk factors and perceptions of chronic illness care in high risk patients.
Ammentorp J, Uhrenfeldt L, Angel F, Ehrensvärd M, Carlsen E B and Kofoed P-E (2013) Can life coaching improve health outcomes? – A systematic review of intervention studies, *BMC Health Services Research* 13:428	Systematic review of health related outcomes of life coaching. 4359 citations identified 5 studies including 2 RCTs. See: Hayashi et at 2008 / Izumi et al 2007 and Wolever et al 2010	Conclusion: The two studies investigating objective health outcomes (HbA1c) showed mixed but promising results, especially concerning the patient group that usually does not benefit from intensified interventions.

Antwi F A, Fazylova N, Garcon M C, Lopez L, Rubiano R and Slyer J T (2013) *Effectiveness of web-based programs on the reduction of childhood obesity in school-aged children: A systematic review*, University of York, Centre for Reviews and Dissemination 11 (6) : 1-44	Systematic review of web based interventions to reduce childhood obesity. 12 articles covering 8 interventions identified. All were RCTs or pseudo RCTs. Data heterogeneity prevented meta analysis.	Four of the eight interventions showed improvements in weight measurements. One study demonstrated a reduction in body mass index z-score at 16 weeks post intervention (F[5,60]=5.11, p=0.027). One study demonstrated a reduction in waist-hip ratio at eight-months post intervention (effect size = -0.01, p=0.02). One study demonstrated a greater loss in mean body fat in the intervention group compared to the control group (-1.12 + 0.47 vs. 0.42 + 0.47, p<0.05). One study demonstrated a reduction in body mass index (t₈₇ = 2.7, p<0.01) and body mass index z-score (T₈₇ = -3.1, p<0.01) at nine-months follow-up. Two interventions showed no difference in weight measures post intervention; two interventions showed an increase in body mass index post intervention.

Bennett G G, Herring S J, Puleo E, Stein E K, Emmons K M and Gillman M W (2010/02) Web-based weight loss in primary care: a randomized controlled trial, *Obesity (Silver.Spring)* 18 (2) : 308-313	A 12-week RCT to evaluate the short-term efficacy of a web-based weight loss intervention among 101 primary care patients with obesity and hypertension. Patients had access to a comprehensive website that used a moderate-intensity weight loss approach designed specifically for web-based implementation. Patients also participated in four (two in-person and two telephonic) counselling sessions with a health coach.	Intent-to-treat analysis showed greater weight loss at 3 months (-2.56 kg; 95% CI -3.60, -1.53) among intervention participants (-2.28 +/- 3.21 kg), relative to usual care (0.28 +/- 1.87 kg). Similar findings were observed among intervention completers (-3.05 kg; 95% CI -4.24, -1.85). High rates of participant retention (84%) and website utilization were observed, with the greatest weight loss found among those with a high frequency of website logins (quartile 4 vs. 1: -4.16 kg; 95% CI -1.47, -6.84). The intervention's approach promoted moderate weight loss at 12 weeks, though greater weight loss was observed among those with higher levels of website utilization. Conclusion: Efficacious web-based weight loss interventions can be successfully offered in the primary care setting

Bennett J A, Lyons K S, Winters-Ston K, Nail L M and Scherer J (2007) Motivational Interviewing to Increase Physical Activity in Long-Term Cancer Survivors: A Randomized Controlled Trial, *Nursing Research* 56 (1) : 18-27	To evaluate the effect of a motivational interviewing (MI) intervention on increasing physical activity (Community Healthy Activities Model Program for Seniors questionnaire) and improving aerobic fitness (6-minute walk), health (Medical Outcomes Study Short-Form 36), and fatigue (Schwartz Cancer Fatigue Scale) in cancer survivors. A secondary purpose was to evaluate whether the effect of MI on physical activities depended on self-efficacy. Fifty-six physically inactive adult cancer survivors (mean = 42 months since completion of treatment) were assigned randomly to intervention and control groups. The MI intervention consisted of one in-person counselling session followed by two MI telephone calls over 6 months. Control group participants received two telephone calls without MI content. Outcomes were measured at baseline, 3 months, and 6 months, and were analyzed using multilevel modelling.	The results of the MI intervention explained significant group differences in regular physical activities (measured in caloric expenditure per week), controlling for time since completion of cancer treatment ($p < .05$). Aerobic fitness, physical and mental health, and fatigue were not different between groups. In the intervention group, individuals with high self-efficacy for exercise at baseline increased their physical activity more than those with low self-efficacy ($p < .05$). In the control group, increases in physical activity did not depend on self-efficacy.

Blackberry I D, Furler J S, Best J D, Chondros P, Vale M, Walker C, Dunning T, Segal L, Dunbar J, Audehm R, Liew D and Young D (2013) Effectiveness of general practice based, practice nurse led telephone coaching on glycaemic control of type 2 diabetes: the Patient Engagement And Coaching for Health (PEACH) pragmatic cluster randomised controlled trial, *BMJ* 347 (f5272)	RCT of GP practices in Victoria, Australia to evaluate the effectiveness of goal focused telephone coaching by practice nurses in improving glycaemic control in patients with type 2 diabetes. Participants: 59 of 69 general practices that agreed to participate recruited sufficient patients and were randomised. Of 829 patients with type 2 diabetes (glycated haemoglobin (HbA1c) >7.5% in the past 12 months) who were assessed for eligibility, 473 (236 from 30 intervention practices and 237 from 29 control practices) agreed to participate. Intervention: Practice nurses from intervention practices received two days of training in a telephone coaching programme, which aimed to deliver eight telephone and one face to face coaching episodes per patient. Main outcome measures: The primary end point was mean absolute change in HbA1c between baseline and 18 months in the intervention group compared with the control group.	Results The intervention and control patients were similar at baseline. None of the practices dropped out over the study period; however, patient attrition rates were 5% in each group (11/236 and 11/237 in the intervention and control group, respectively). The median number of coaching sessions received by the 236 intervention patients was 3 (interquartile range 1-5), of which 25% (58/236) did not receive any coaching sessions. At 18 months' follow-up the effect on glycaemic control did not differ significantly (mean difference 0.02, 95% confidence interval -0.20 to 0.24, P=0.84) between the intervention and control groups, adjusted for HbA1c measured at baseline and the clustering. Other biochemical and clinical outcomes were similar in both groups. Conclusions A practice nurse led telephone coaching intervention implemented in the real world primary care setting produced comparable outcomes to usual primary care in Australia. The addition of a goal focused coaching role onto the ongoing generalist role of a practice nurse without prescribing rights was found to be ineffective.

Bray K, Turpin R S, Jungkind K and Heuser G (2008/04) Defining success in diabetes disease management: Digging deeper in the data. [References], *Disease Management* .11 (2)	Evaluation of the effectiveness of a diabetes life coach program emphasising lipid, blood pressure, and glycemic control, using personal coaching, group classes, reminders, and customized feedback, targeting all health plan members over age 18 with type 1 or 2 diabetes mellitus in 6 primary care practice sites in the Hampton Roads area of Virginia.. Results for 1117 participants using 7 measures including 3 American Diabetes Association (ADA) measures and 2 self-reported behavioural measures.	Statistically significant improvement at $P < 0.05$ was noted in all 7 targeted measures compared with baseline. Participants who were engaged in the life coach program were 40% less likely to experience poor control of their A1c, 50% more likely to meet the ADA A1c goal of <7%, 11% more likely to meet their blood pressure goal of <130/80 mmHg, and 7% more likely to meet their LDL-C goal of <100 mg/dL compared with those not engaged. Patients who became engaged in the program performed significantly better in the key diabetes indicators that ultimately lead to reductions in the complications of the disease over time.
Butterworth S, Linden A, McClay W, and Leo M C (2006) Effect of Motivational Interviewing-Based Health Coaching on Employees' Physical and Mental Health Status, *Journal of Occupational Health Psychology* 11 (4) : 358-365	Self-selecting (non-randomised) study of 276 health centre employees. Treatment group received a 3-month health coaching intervention by health care professional trained in motivational interviewing (MI). Evaluated using mental Composite Score (MCS) and Physical Composite Score (PCS) derived from a 12 question health status survey based on SF-36.	The treatment group scored significantly lower on both the PCS and the MCS than the control group. The treatment group improved their outcomes on both the PCS (1.69 points, p=.035) and on the MCS (4.40 points, p=.0001), while the control group showed no statistically significant change on either scale. (an alternative design to offset selection bias showed similar results.) Conclusion: MI-based health coaching is effective in improving both physical and mental health status in an occupational setting.

Dennis S M, Harris M, Lloyd J, Powell-Davies G, Faruqi N. and Zwar N (2013/06) Do people with existing chronic conditions benefit from telephone coaching? A rapid review. [Review], *Australian Health Review* 37 (3) : 381-388	A rapid review: 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. 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 the coaching. 1756 papers, reduced to 30 after screening and relevance checks.	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. Telephone-based coaching can enhance the management of chronic disease, especially for vulnerable groups. 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 Telephone coaching is an effective means of supporting people with chronic diseases to manage their own health. 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.

Dickens A P, Richards S H, Hawton A, Taylor R S, Greaves C J, Green C, Edwards R and Campbell J L (2011) An evaluation of the effectiveness of a community mentoring service for socially isolated older people: a controlled trial, *BMC Public Health* 11 : 218	The purpose of this study was to examine the effectiveness of a community-based mentoring service for improving mental health, social engagement and physical health for socially isolated older people. This prospective controlled trial compared a sample of mentoring service clients (intervention group) with a matched control group recruited through general practice. One hundred and ninety five participants from each group were matched on mental wellbeing and social activity scores. Assessments were conducted at baseline and at six month follow-up. The primary outcome was the Short Form Health Survey v2 (SF-12) mental health component score (MCS). Secondary outcomes included the SF-12 physical health component score (PCS), EuroQol EQ-5D, Geriatric Depression Score (GDS-10), social activity, social support and morbidities.	No evidence was found that mentoring was beneficial across a wide range of participant outcomes measuring health status, social activity and depression. No statistically significant between-group differences were observed at follow-up in the primary outcome ($p = 0.48$) and in most secondary outcomes.. Conclusions: The results of this trial provide no substantial evidence supporting the use of community mentoring as an effective means of alleviating social isolation in older people.

DuBois D L H (2002) Effectiveness of mentoring programs for youth: a meta-analytic review, *American journal of community psychology* 30 (2) : 157-197	A meta-analysis of 55 evaluations of the effect of mentoring programs on youth.	Evidence of only a modest or small benefit of program participation for the average youth. Program effects are enhanced significantly however, when greater numbers of both theory-based and empirically based "best practices" are utilized and when strong relationships are formed between mentors and youth. Youth from backgrounds of environmental risk and disadvantage appear most likely to benefit from participation in mentoring programs. Outcomes for youth at-risk due to personal vulnerabilities have varied substantially in relation to program characteristics, with a noteworthy potential evident for poorly implemented programs to actually have an adverse effect on such youth.

Edelman D, Oddone E Z, Liebowitz R S, Yancy W S Jr, Olsen M K, Jeffreys A S, Moon S D, Harris A C, Smith L L, Quillian-Wolever R E and Gaudet T W (2006/07) A multidimensional integrative medicine intervention to improve cardiovascular risk, *Journal of General Internal Medicine* 21 (7) : 728-734	To determine whether personalized health planning (PHP), reduces 10-year risk of coronary heart disease (CHD). RCT of 154 outpatients age 45 or over, with 1 or more known cardiovascular risk factors. Following a health risk assessment, each subject in the intervention arm worked with a health coach and a medical provider to construct a personalized health plan. The coach then assisted each subject in implementing her/his health plan. Techniques used in implementation included mindfulness meditation, relaxation training, stress management, motivational techniques, and health education and coaching. Subjects randomized to the comparison group received usual care (UC) without access to the intervention. The primary outcome measure was 10-year risk of CHD, as measured by a standard Framingham risk score, and assessed at baseline, 5, and 10 months.	Baseline 10-year risk of CHD was 11.1% for subjects randomized to UC (n=77), and 9.3% for subjects randomized to PHP (n=77). Over 10 months of the intervention, CHD risk decreased to 9.8% for UC subjects and 7.8% for intervention subjects. Based on a linear mixed-effects model, there was a statistically significant difference in the rate of risk improvement between the 2 arms (P=.04). In secondary analyses, subjects in the PHP arm were found to have increased days of exercise per week compared with UC (3.7 vs 2.4, P=.002), and subjects who were overweight on entry into the study had greater weight loss in the PHP arm compared with UC (P=.06). Conclusions: A multidimensional intervention based on integrative medicine principles reduced risk of CHD, possibly by increasing exercise and improving weight loss

Gilstrap L G F (2012) Community-based, primary prevention programs improve psychological and cardiovascular health, *Journal of the American College of Cardiology* Conference (var.pagings) : E1752	Based on a suggested relationship between psychosocial factors and cardiovascular health an effect which may be greatest among low income and minority patients, sixty-four low-income and minority women with at least two pre-existing cardiovascular risk factors were enrolled in a community-based, lifestyle intervention program - The HAPPY Heart Program. Patients were cared for over two years by a multidisciplinary team including: primary physician, cardiologist, nutritionist, physical therapist and health coach. Using validated psychological tools, STAI (anxiety), CESD-10 (depression) and PSS (stress), the levels of each were measured and baseline, year 1 and 2. Changes in psychological stress were then compared to changes in cholesterol and insulin resistance (HbAlc and BMI).	Women enrolled in the lifestyle intervention program saw significant decreases in anxiety (p=0.004), depression (p=0.032) and stress (p=0.006) at year 1. By year 2, the levels decreased further: anxiety (p=0.0003), depression (p=0.006) and stress (p=0.0015). Further analysis revealed that higher baseline levels of anxiety (0.024/p=0.06), depression (=0.26/p=0.04) and stress (=0.28/p=0.03) were associated with higher baseline LDL levels. In addition, higher baseline depression (=0.33/p=0.03) and stress (=0.42/p=0.004) scores were associated with less improvement in HbAlc during the first year of follow up. However, improvement in anxiety levels over time, were significantly associated with deceases in HbAlc (=0.34/p=0.02) and BMI (=0.45/p=0.002) over the same time period. Conclusion: In this "high risk," low income, minority population of women, a comprehensive, lifestyle intervention program significantly decreased levels of anxiety, depression and stress.
Härter M, Dwinger S, Seebauer L, Simon D, Herbarth L, Siegmund-Schultze E, Temmert D, Bermejo I and Dirmaier J (2013) Evaluation of telephone health coaching of German health insurants with chronic conditions, *Health Education Journal* 72 (5) : 622-634	This study aimed to investigate how patients with chronic conditions evaluate telephone health coaching provided by their health insurance company. A retrospective survey was conducted among coaching participants (n=834). Outcomes included the general evaluation of the coaching, the evaluation of process and effects and the impact on patient-physician communication.	The majority (78.3%) of the insured persons were satisfied with the coaching and 82.3% would recommend it to others. More than half of the participants (53.3%) had learned about new options to influence their health condition.

Hayashi A, Kayama M, Ando K, Ono M, Suzukamo Y, Michimata A Akiyama M O, Fukuhara S and Izumi S-I (2008) Analysis of subjective evaluations of the functions of tele-coaching intervention in patients with spinocerebellar degeneration., *NeuroRehabilitation* 23 : 159-169 / Izumi S, Ando K, Ono M, Suzukamo Y, Michimata A and Fukuhara S (2007) Effect of coaching on psychological adjustment in patients with spinocerebellar degeneration: a pilot study., *Clinical Rehabilitation* 21 (11) : 987-996	RCT to examine effect of coaching intervention on psychological adjustment to illness and health-related QOL (HRQOL) in patients with spinocerebellar degeneration. Twelve independently living patients with spinocerebellar degeneration aged 20—65 years old, without cognitive impairment or psychiatric disorder received coaching intervention, which was postponed in another 12 (control). Three physician coaches telephoned assigned patients for 15—30 minutes in each of 10 weekly coaching sessions over three months. Main outcome measures: HRQOL (SF-36) and psychological adjustment to illness (Nottingham Adjustment Scale, Japanese version; NAS-J).	Two-way analysis of variance (group × time) showed statistically significant main effects of time for vitality ($F = 5.00$; $P = 0.036$), anxiety/depression ($F = 5.15$; $P = 0.033$), and locus of control ($F = 5.58$; $P = 0.027$), indicating improvement of scores over time in both coaching and control groups. No main effect of group or interaction was seen. However analysis of covariance with baseline scores as the covariate showed the coaching group to have better self-efficacy scores than controls at follow-up (least-square mean, experimental group, 65.1; control group, 52.7; $P = 0.037$). Conclusion: Carefully structured telephone coaching can improve self-efficacy in patients with spinocerebellar degeneration.
Howard-Jones G, Wagland R (2013/01) Assessing the effectiveness of health coaching for cancer survivors, *Psycho-Oncology* Conference (var.pagings) : January	A systematic review to examine the effectiveness of health coaching using personal goal setting, to enhance the health of cancer survivors. Of the 3,666 papers examined 2 met inclusion criteria	There was low to moderate quality evidence that health coaching resulted in improved physical health, low to moderate quality evidence indicated that psychological health increased with coaching and low quality evidence indicated that health coaching had positive effects on lifestyle behaviours.

Hutchison A J and Breckon J D (2011) A review of telephone coaching services for people with long-term conditions, *Journal of Telemedicine and Telecare* 17 (8) : 451-458	A literature search retrieved 41 articles which reported on the development and the efficacy of 34 separate telephone coaching interventions for LTC management. Twenty-seven (79%) of the studies reported on randomised designs involving at least one control or comparison group/condition. Of the 34 interventions reviewed, 17 (50%) were aimed at diabetes management and 17 (50%) were designed to manage chronic cardiovascular conditions.	Most studies (32 or 94%) reported outcomes in favour of the telephone coaching intervention, although few (15%) employed any form of cost-benefit analysis (CBA).
Jordan M (2013/05) Health Coaching for the Underserved, *Global Advances* 2 (3) : 75-82	Twelve individuals (four homeless, two formerly homeless, and six low-income) received 12 weeks of free health coaching, an intervention normally undertaken by clients who pay $40 to $200 out of pocket for coaching services. The health coaching relationships were conducted with protocols developed for managing executive health at a Fortune 100 firm.	This case report illustrates how the motivational power of coaching conversations was a modestly useful methodology in breaking through the social isolation and loneliness of street-dwelling adults with chronic health problems. It also was a useful methodology for developing capacity for accomplishing short-term goals that were self-identified. Additionally, health coaching presented an opportunity for transitioning poverty-level individuals from passive recipients using public health sector services to more empowered actors with first-stage awareness who initiated preventive health actions

Kosey J, Simmons L, Perlman A, Smith L and Wolever R (2012) Integrative Health Coaching: The accumulating research at Duke IM, *BMC Complementary and Alternative Medicine* Conference (var.pagings) : 12	To evaluate the effectiveness of Integrative Health Coaching (IHC) as a method to make and sustain behavioural changes to combat chronic conditions, including cardiovascular disease (CVD), diabetes, and obesity, Duke Integrative Medicine (IM) has completed 3 RCTs, a rigorous observational study, and a large program evaluation utilizing IHC.	In the first RCT, targeting CVD prevention, IHC improved 10 year CVD risk scores (Framingham) faster and more substantially than did usual care (UC). IHC patients also increased exercise and reduced their blood pressure, and the overweight IHC patients had greater weight loss. In a second RCT, patients with type 2 diabetes received 6 months of IHC. Compared to UC, the IHC group improved medication adherence, patient activation, exercise frequency, social support and benefit-finding. Those with baseline HbA1c > 7.0 also improved glycemic control. Subsequently, when the UC group also received IHC, additional improvements were captured including mood, perceived stress, and health-related quality of life. A third RCT examined the effects of mindfulness-based experiential education paired with IHC compared to an attention, education support control on weight loss maintenance. While both groups maintained significant weight loss eighteen months post-baseline, those in the IHC group lost additional weight. In a fourth study, a 3-day immersion with 8 months of IHC follow-up reduced 5 year stroke and diabetes risk through small improvements in multiple parameters (e.g., exercise behavior, resting pulse, BMI, waist circumference, and cholesterol). Finally, results from a health promotion program utilizing IHC showed a decline in inpatient admissions for those receiving IHC.

Lawson K L, Jonk Y, O'Connor H, Riise K S, Eisenberg D M and Kreitzer M J (2013) The impact of telephonic health coaching on health outcomes in a high-risk population, *Global Advances In Health and Medicine* 2 (3) : 40-47	High-risk health plan enrollees were invited to participate in a telephonic health coaching intervention addressing the whole person and focusing on motivating health behaviour changes. Outcomes of self-reported lifestyle behaviours, perceived health, stress levels, quality of life, readiness to make changes, and patient activation levels were reported at baseline and upon program completion. Less than 7% of the 114 615 potential candidates self-selected to actively participate in health coaching, those with the highest chronic disease load being the most likely to participate. Of those participating 16% fully completed pre and post health inventories and 8% completed a Patient Activation Measure (PAM).	The conditions most often represented in the active participants were depression, congestive heart failure, diabetes, hyperlipidemia, hypertension, osteoporosis, asthma, and low back pain. In 6 months or less, 89% of participants met at least one goal. Significant improvements occurred in stress levels, healthy eating, exercise levels, and physical and emotional health, as well as in readiness to make change and PAM scores.
Lin W-C, Chien H-L, Willis G, O'Connell E, Rennie K S and Bottella H (2012) The effect of a telephone-based health coaching disease management program on Medicaid members with chronic conditions, *Medical Care* .50 (1)	To determine the effect of a telephone-based health coaching disease management program on Medicaid members aged 18 to 64 with a diagnosis of qualifying chronic conditions and 2 acute health service events of hospitalizations and/or ED visits within a 12-month period. By considering differences between the treatment and control group before and after treatment, hospitalizations, emergency department (ED) visits, ambulatory care visits, and Medicaid expenditures among program members for 1 year before and 2 years after their enrollment were compared with a matched comparison group.	Changes in acute hospitalizations, ambulatory care visits, and Medicaid expenditures before and after program enrollment were similar between the 2 study groups. However, during the second year after enrollment, program members had a significantly smaller decrease in ED visits than the comparisons (8% in program members and 23% in comparisons, P value = 0.03). Conclusions: Compared with a matched comparison group, the telephone-based health coaching disease management program did not demonstrate significant effects on healthcare utilization and expenditures in Medicaid members with chronic conditions.

Linden A, Butterworth S W and Prochaska J O (2010) Motivational interviewing-based health coaching as a chronic care intervention, *Journal of Evaluation in Clinical Practice* 16 (1) : 166-174	To evaluate the impact of motivational interviewing-based health coaching on a chronically ill group of participants compared with non-participants. One hundred and six chronically ill programme participants completed a health risk survey instrument prior to enrolment and again at approximately 8 months. Outcomes were compared with 230 chronically ill non-participants who completed the survey twice over a similar time frame.	Compared with non-participants, programme participants improved their self-efficacy (P = 0.01), patient activation (P = 0.02), lifestyle change score (P = 0.01) and perceived health status (P = 0.03). Fewer participants increased their stages of change risk over time than non-participants (P < 0.01), and more participants decreased their stages of change risk over time than non-participants (P = 0.03). Conclusion: These results support motivational interviewing-based health coaching as an effective chronic care management intervention.
Lundahl B W, Kunz C, Brownell C, Tollefson D and Burke B L (2010) A Meta-Analysis of Motivational interviewing: Twenty-five years of empirical studies, *Research on Social Work Practice* 20 : 137-160	A total of 119 studies were subjected to a meta-analysis. Targeted outcomes included substance use (tobacco, alcohol, drugs, marijuana), health-related behaviours (diet, exercise, safe sex), gambling, and 'engagement in treatment' variables.	Judged against weak comparison groups, MI produced statistically significant, durable results in the small effect range (average g =0.28). Judged against specific treatments, MI produced non-significant results (average g =0.09). MI was robust across many moderators, although feedback (Motivational Enhancement Therapy [MET]), delivery time, manualization, delivery mode (group vs. individual), and ethnicity moderated outcomes.

Merrill R M A (2010) Employee weight management through health coaching, *Eating and Weight Disorders* 15 (1-2) : e52-e59	A study to evaluate the effectiveness of an interactive health coaching intervention at lowering weight. The study involved 5405 overweight or obese employees aged 18-85, who entered the program sometime during 2001-2008.	Average body mass index (BMI) significantly decreased from 32.1 at baseline to 31.4 at 3 months, 31.0 at 6 months, and 30.6 at 12 months. Decreasing BMI was more pronounced in older age groups and among women, those using weight loss medication, those with higher BMI, and those with higher motivation and confidence to make behaviour changes. When the effects of these variables on the decreasing trend in BMI were simultaneously estimated, only baseline classifications of BMI, health status, and confidence remained significant. Change in BMI through 12 months was -0.7% for those with normal weight, -2.0% for overweight, -3.6% for obese, and -7.1% for morbidly obese individuals at baseline. Among morbidly obese individuals, decrease in BMI through 12 months was -7.6% for those with "high" confidence to lose weight at baseline vs -4.4% for those with low confidence. Better health status at baseline was also related to more pronounced weight loss.
Moore C (2013) Case report of hemoglobin A1c and weight reduction in integrative health coaching, *Global Advances In Health and Medicine* 2 (3) : 87-89	An individual case report in which Integrative health coaching (IHC) offered significant health improvement in biometric measures without pharmaceuticals. This intervention included a client self-assessment and 14 in-person health coaching sessions over 11 months.	In this case of newly diagnosed impaired glucose tolerance (IGT) with obesity, IHC used the patient's strengths to reverse IGT, prevent frank diabetes, and reduce weight by 40 lbs or 21% of her original weight.

Nishita C, Cardazone G, Uehara D L and Tom T (2013) Empowered diabetes management: life coaching and pharmacist counseling for employed adults with diabetes, *Health Education & Behavior* 40 (5) : 581-591	A randomized controlled trial examining the effect of a participant-driven, multi-component intervention on 190 employed adults with diabetes, 36% of whom were Asian and 35% of whom were Native Hawaiian or Pacific Islander. The treatment group was provided an intervention that paired each participant with a life coach and a pharmacist counsellor with whom they worked to achieve collaboratively chosen goals.	Repeated-measures analysis of covariance analyses indicate that the intervention had a significant positive effect on participants' diabetes self-efficacy, quality of life, and body mass index but not on haemoglobin A1c levels. Analysis examining just the treatment group indicated a dosage effect, with body mass index and quality of life outcomes optimized among participants who engaged in a greater number of sessions with life coaches and pharmacists.
O'Hara B J, Phongsavan P, Venugopal K, Eakin E G, Eggins D, Caterson H, King L, lman-Farinelli M, Haas M and Bauman A E (2012) Effectiveness of Australia's Get Healthy Information and Coaching Service: translational research with population wide impact, *Preventive Medicine* 55 (4) : 292-298	Evaluation of the Australia's, telephone based, Get Healthy Information and Coaching Service, to improve lifestyle behaviours. Using a pre-post design, New South Wales participants who completed telephone-based coaching between February 2009 and December 2011 were included. Outcomes comprised self-reported weight, waist circumference, height, physical activity and dietary behaviours. Matched pair analyses and multivariate modelling were performed to assess behavioural changes.	Participants (n=1440) reported statistically significant improvements in weight (-3.9 kg (5.1)); waist circumference (-5.0 cm (6.0)); and Body Mass Index (-1.4 BMI units (1.8)); number of walking and moderate-vigorous physical activity sessions of >30 min per week; number of vigorous physical activity sessions of >20 min per week and servings of vegetables; fruit; take-away meals and sweetened drinks (all $p<0.001$). Improvements in weight, waist, moderate physical activity, fruit and vegetable and take-away meals consumption remained significant after adjusting for socio-demographic characteristics.

Olsen J M and Nesbitt B J (2010) Health coaching to improve healthy lifestyle behaviours: an integrative review, *American Journal of Health Promotion* 25 (1) : 1-12	A search of electronic databases for articles on the use of health coaching to improve healthy lifestyle behaviours yielded 15 documents	All 15 studies utilized non-probability sampling, 7 (47%) with randomized intervention and control groups. Significant improvements in one or more of the behaviours of nutrition, physical activity, weight management, or medication adherence were identified in six (40%) of the studies. Common features of effective programs were goal setting (73%), motivational interviewing (27%), and collaboration with health care providers (20%).

Pringle A, Cooke C, Gilson N, Marsh K and McKenna J (2010) Cost-effectiveness of interventions to improve moderate physical activity: A study in nine UK sites, *Health Education Journal* 69 (2) : 211-224	This study measured change in moderate physical activity (MPA) in seven community-based intervention types, costs and cost-effectiveness of the interventions, and possible explanations for cost variation. MPA was collected using self-report measures. MPA categories (sedentary, lightly, moderately, highly active) were assigned at pre- and post-intervention. Differences between pre- and post-intervention scores identified MPA change (median metabolic equivalent (MET)-minutes/week) in completers. Cost, attendance and activity data were combined to estimate the average monthly implementation cost, cost per participant attending interventions, and the cost per completer improving MPA category. An economic model was built to estimate the cost per Quality Adjusted Life Year (QALY) gained and potential savings to the National Health Service (NHS). A wide range of physical activity interventions were assessed. They were grouped into campaigns, exercise classes, exercise referrals (for patients with health problems), motivational interviews, outdoor activity, peer-monitoring, and leader training interventions. They were conducted in locations of high health need, in nine UK primary health care trusts. Testing occurred before and after the intervention, over varied durations, to estimate the changes in activity.	The mean monthly costs to the NHS ranged from £504 for exercise classes to £9,227 for exercise referrals. Campaigns ranged from £745 to £1,809, exercise classes from £504 to £6,387, exercise referrals from £648 to £9,227, motivational interviews from £1,216 to £4,429, outdoor activity from £1,211 to £1,729, peer-mentoring from £637 to £1,969, and training physical leaders from £1,030 to £1,302. The cost per participant attending the interventions ranged from £55 to £3,420. The cost per completer who improved by at least one activity level ranged from £260 to £2,786. The cost per QALY gained from the interventions ranged from £47 (motivational interviews) to £509 (exercise referral), with this range being below the £20,000 per QALY threshold. Conclusion: Motivational Interviewing (MI) is the most cost effective intervention to improve moderate physical activity when measured by QALY gain.

Rubak S, Sandbæk A, Lauritzen T and Christensen B (2005) Motivational interviewing: a systematic review and meta-analysis, *British Journal of General Practice* 55 : 305-312	A systematic review and meta-analysis of randomised controlled trials using motivational interviewing as the intervention. Asystematic literature search in 16 databases produced 72 randomised controlled trials A generic inverse variance meta-analysis was performed.	Meta-analysis showed a significant effect (95% confidence interval) for motivational interviewing for combined effect estimates for body mass index, total blood cholesterol, systolic blood pressure, blood alcohol concentration and standard ethanol content, while combined effect estimates for cigarettes per day and for HbA1c were not significant. Motivational interviewing had a significant and clinically relevant effect in approximately three out of four studies, with an equal effect on physiological (72%) and psychological (75%) diseases. Psychologists and physicians obtained an effect in approximately 80% of the studies, while other healthcare providers obtained an effect in 46% of the studies. When using motivational interviewing in brief encounters of 15 minutes, 64% of the studies showed an effect. More than one encounter with the patient ensures the effectiveness of motivational interviewing. Conclusion: Motivational interviewing in a scientific setting outperforms traditional advice giving in the treatment of a broad range of behavioural problems and diseases.

Selvaraj F J, Mohamed M, Omar K, Nanthan S, Kusiar Z, Subramaniam S Y, Ali N, Karanakaran K, Ahmad F and Low W H (2012) The impact of a disease management program (COACH) on the attainment of better cardiovascular risk control in dyslipidaemic patients at primary care centres (The DISSEMINATE Study): a randomised controlled trial, *BMC Family Practice* 13 : 97	To evaluate the efficacy of Counselling and Advisory Care for Health (COACH) programme in managing dyslipidaemia among primary care practices in Malaysia. This open-label, parallel, RCT compared the COACH programme delivered by primary care physicians alone (PCP arm) and primary care physicians assisted by nurse educators (PCP-NE arm). The study recruited 297 subjects, new to treatment, who had the primary diagnosis of dyslipidaemia; 149 were randomised to the COACH programme delivered by primary care physicians assisted by nurse educators (PCP-NE) and 148 to care provided by primary care physicians (PCP) alone.	Both study arms demonstrated improvement in LDL-C from baseline. The least squares (LS) mean change from baseline LDL-C were -30.09% and -27.54% for PCP-NE and PCP respectively. The difference in mean change between groups was 2.55% (p=0.288), with a greater change seen in the PCP-NE arm. Similar observations were made between the study groups in relation to total cholesterol change at week 24. Significant difference in percentage change from baseline of HDL-C were observed between the PCP-NE and PCP groups, 3.01%, 95% CI 0.12-5.90, p=0.041, at week 24. There was no significant difference in lipid outcomes between 2 study groups at week 36 (12 weeks after the programme had ended). Conclusion: Patients who received coaching and advice from primary care physicians (with or without the assistance by nurse educators) showed improvement in LDL-cholesterol. Disease management services delivered by PCP-NE demonstrated a trend towards add-on improvements in cholesterol control compared to care delivered by physicians alone; however, the improvements were not maintained when the services were withdrawn.

Sieber W, Newsome A and Lillie D (2012) Promoting self-management in diabetes: efficacy of a collaborative care approach, *Families, Systems and Health* 30 (4) : 322-329	This study involves 22 randomly assigned physicians across three family medicine clinics to either provide usual care or work with a part-time collaborative care therapist in their clinic serving as an outreach health coach for their diabetic patients. Each outreach health coach met with each physician in the intervention group to identify patients most in need of intervention, sent identified patients a video on diabetes management, and called to encourage video viewing and discuss any patient-perceived barriers to self-management.	Patients targeted by an outreach health coach were more likely to view the video, be seen by their primary care physician (PCP) within 6 months, and have disease-relevant laboratory tests performed than patients receiving usual care from their PCP ($p < .05$).

Steventon A, Tunkel S, Blunt I and Bardsley M (2013) Effect of telephone health coaching (Birmingham OwnHealth) on hospital use and associated costs: cohort study with matched controls, *BMJ* 347:f4585	To test the effect of a telephone health coaching service (Birmingham OwnHealth) on hospital use and associated costs. 2698 patients recruited from local general practices before 2009 with heart failure, coronary heart disease, diabetes, or chronic obstructive pulmonary disease; and a history of inpatient or outpatient hospital use.- matched to a control group. Control participants received usual healthcare in their areas, which did not include telephone health coaching. Main outcome measures Number of emergency hospital admissions per head over 12 months after enrolment. Secondary metrics calculated over 12 months were: hospital bed days, elective hospital admissions, outpatient attendances, and secondary care costs.	In relation to diagnoses of health conditions and other baseline variables, matched controls and intervention patients were similar before the date of enrolment. After this point, emergency admissions increased more quickly among intervention participants than matched controls (difference 0.05 admissions per head, 95% confidence interval 0.00 to 0.09, P=0.046). Outpatient attendances also increased more quickly in the intervention group (difference 0.37 attendances per head, 0.16 to 0.58, P<0.001), as did secondary care costs (difference £175 per head, £22 to £328, P=0.025). Checks showed that we were unlikely to have missed reductions in emergency admissions because of unobserved differences between intervention and matched control groups. Conclusions: The Birmingham OwnHealth telephone health coaching intervention did not lead to the expected reductions in hospital admissions or secondary care costs over 12 months, and could have led to increases

Thom D H, Ghorob A, Hessler D, De Vore D, Chen E and Bodenheimer T A (2013) Impact of peer health coaching on glycemic control in low-income patients with diabetes: a randomized controlled trial, *Annals of family medicine* 11 (2) : 137-144	A randomized controlled trial enrolling patients from 6 public health clinics in San Francisco. Twenty-three patients with a glycated haemoglobin (HbA1C) level of less than 8.5%, who completed a 36-hour health coach training class, acted as peer coaches. Patients from the same clinics with HbA1C levels of 8.0% or more were recruited and randomized to receive health coaching (n = 148) or usual care (n = 151). The primary outcome was the difference in change in HbA1C levels at 6 months. Secondary outcomes were proportion of patients with a decrease in HbA1C level of 1.0% or more and proportion of patients with an HbA1C level of less than 7.5% at 6 months.	At 6 months, HbA1C levels had decreased by 1.07% in the coached group and 0.3% in the usual care group, a difference of 0.77% in favour of coaching (P = .01, adjusted). HbA1C levels decreased 1.0% or more in 49.6% of coached patients vs 31.5% of usual care patients (P = .001, adjusted), and levels at 6 months were less than 7.5% for 22.0% of coached vs 14.9% of usual care patients (P = .04, adjusted). Conclusions: Peer health coaching significantly improved diabetes control in this group of low-income primary care patients

Vale M J, Jelinek M V, Best J D, Dart A M, Grigg L E, Hare D L, Ho B P, Newman R W and McNeil J J (2003) Coaching patients On Achieving Cardiovascular Health (COACH): a multicenter randomized trial in patients with coronary heart disease, *Archives of internal medicine* 163 (22) : 2775-2783	The objective of the Coaching patients On Achieving Cardiovascular Health (COACH) study was to determine whether dietitians or nurses who did not prescribe medications could coach patients with coronary heart disease to work with their physicians to achieve the target levels for their total cholesterol (TC) and other risk factors. The study was a multicentre randomized controlled trial in which 792 patients from 6 university teaching hospitals underwent a stratified randomization by cardiac diagnosis within each hospital: 398 were assigned to usual care plus The COACH Program and 394 to usual care alone. Patients in The COACH Program group received regular personal coaching via telephone and mailings to achieve the target levels for their particular coronary risk factors. The primary outcome was the change in TC (DeltaTC) from baseline (in hospital) to 6 months after randomization. Secondary outcomes included measurement of a wide range of physical, nutritional, and psychological factors.	The COACH Program achieved a significantly greater DeltaTC than usual care alone: the mean DeltaTC was 21 mg/dL (0.54 mmol/L) (95% confidence interval [CI], 16-25 mg/dL [0.42-0.65 mmol/L]) in The COACH Program vs 7 mg/dL (0.18 mmol/L) (95% CI, 3-11 mg/dL [0.07-0.29 mmol/L]) in the usual care group (P<.0001). Thus, the reduction in TC from baseline to 6 months after randomization was 14 mg/dL (0.36 mmol/L) (95% CI, 8-20 mg/dL [0.20-0.52 mmol/L]) greater in The COACH Program group than in the usual care group. Coaching produced substantial improvements in most of the other coronary risk factors and in patient quality of life. Conclusions: Coaching, delivered as The COACH Program, is a highly effective strategy in reducing TC and many other coronary risk factors in patients with coronary heart disease

Verof D R, Ochoa-Arvelo T and Venator B (2013) A randomized study of telephonic care support in populations at risk for musculoskeletal preference-sensitive surgeries, *BMC Medical Informatics and Decision Making* 13 : 21	A comparative study testing the relative impact on health utilization and costs of active outreach through interactive voice response technology to encourage health coaching in support of shared decision making in comparison to mailed outreach or no outreach. This study focused on individuals with back pain or joint pain. An interactive voice response (IVR) form of outreach that included the capability for individuals to directly connect with health coaches telephonically, was compared to a control (mailed outreach or natural levels of inbound calling depending on the study wave). In total, the study include 24,167 adults with commercial and Medicare Advantage private coverage at three health plans and at risk for lumbar back surgery, hip repair/replacement, or knee repair/replacement	Interactive voice response outreach led to 10.7 (P-value < .0001) times as many inbound calls within 30 days as the control. Over 180 days, the IVR group ("intervention") had 67 percent (P-value < .0001) more health coach communications and agreed to be sent 3.2 (P-value < .0001) time as many DVD- and/or booklet-based decision aids. Targeted surgeries were reduced by 6.7 percent (P-value = .6039). Overall costs were lower by 4.9 percent (P-value = .055). Costs that were not related to maternity, cancer, trauma and substance abuse ("actionable costs") were reduced by 6.5 percent (P-value = .0286). Conclusions: IVR with a transfer-to-health coach-option significantly increased levels of health coaching compared to mailed or no outreach and led to significantly reduced actionable medical costs.
Wolever R Q, Dreusicke M, Fikkan J, Hawkins T V, Yeung S, Wakefield J, Duda L, Flowers P, Cook C and Skinner E (2010) Integrative health coaching for patients with type 2 diabetes: a randomized clinical trial., *The Diabetes Educator* 36 (4) : 629-639	Fifty-six patients with type 2 diabetes were randomized to either 6 months of integrative health (IH) coaching or usual care (control group). Coaching was conducted by telephone for fourteen 30-minute sessions. Patients were guided in creating an individualized vision of health, and goals were self-chosen to align with personal values. The coaching agenda, discussion topics, and goals were those of the patient, not the provider. Preintervention and postintervention assessments measured medication adherence, exercise frequency, patient engagement, psychosocial variables, and A1C (HbA1c).	Perceived barriers to medication adherence decreased, while patient activation, perceived social support, and benefit finding all increased in the IH coaching group compared with those in the control group. Improvements in the coaching group alone were also observed for self-reported adherence, exercise frequency, stress, and perceived health status. Coaching participants with elevated baseline A1C (=7%) significantly reduced their A1C.