

The Role and Effectiveness of Diabetes Coaches in British Columbia

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Executive Summary

This two-year pilot project, funded by the Lawson Foundation, investigated the effectiveness of telephone-delivered peer coaching to persons with type 2 diabetes who were experiencing difficulty in managing their condition. The project was a partnership between the 11 Diabetes Health Centres in the Fraser Health Region of BC and the University of Victoria, Institute on Aging and Lifelong Health.

The research investigated four major aspects of peer coaching, specifically: 1) the feasibility and viability of recruiting, training and pairing peer coaches with patients; 2) whether peer coaching brought about improved outcomes; 3) whether patient characteristics (i.e., sex, age, education level and number of chronic health conditions) influence program effectiveness; and 4) the process of peer coaching.

The findings relating to feasibility and viability clearly demonstrated that peer coaches can be recruited, trained, and paired with persons with type 2 diabetes for a 26-week period. The quantitative study which examined changes in health outcomes from baseline to 6 and 12 months found statistically significant improvements at both six and twelve months. At 12 months the mean participant A1C level had decreased by 9%; patient activation had increased by 15%; diabetes empowerment had increased by 10%; diabetes self-efficacy had increased by 23%; depression level had decreased by 24% and communication with physician had increased by 22%. Regarding the question whether patient characteristics of sex, age, education level and number of chronic health conditions influenced program effectiveness, the analysis found that the fourteen outcomes were not influenced by these covariates.

The grounded theory qualitative research investigated the interactions between the coaches and participants and summarized the main categories and themes of interactions that contributed to the behavioural improvements experienced by participants. Participants shared how having a coach positively impacted their daily management of diabetes.

In summary, this study found that a pragmatic low-cost telephone peer coaching intervention assisted persons with type 2 diabetes to improve healthy behaviours and better self-manage their diabetes. The central feature of the program is that persons who have a chronic condition themselves can acquire training and then help other persons with chronic conditions. This is a key component of BC's Patient as Partners Initiative, particularly, involving volunteer peers in the spectrum of care is a cost-effective way of providing additional support and continuity of care.

The research and analysis were officially completed in the spring of 2017 and demonstrated that involving peers in providing telephone peer coaching was both pragmatic and effective. Slight modifications were incorporated into the program (i.e., provincial access for persons with other types of chronic conditions, intervention period of three months with possibility of extension to six months) and support for ongoing provincial implementation was provided by the BC Ministry of Health under the Provincial Patients as Partners Initiative.

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The Role and Effectiveness of Diabetes Coaches in British Columbia

Background

During the last decade research studies have consistently found that individual management and outcomes of type 2 diabetes are enhanced through the use of self-management strategies.¹⁻⁵ One model of self-management delivery, the Stanford programs, are delivered by either health professionals or trained peer leaders, and have consistently shown positive results in a number of settings.⁶⁻¹² Using another mode, telephone coaching, both diabetes clinicians¹³⁻¹⁵ and peers^{14, 16-22} have also demonstrated effectiveness in bringing about improved outcomes. As well, a recent pilot²³ has investigated the acceptability and feasibility of involving health professionals as health coaches in Primary Care. The effectiveness of involving peer coaches with persons with type 2 diabetes in a Canadian context has not been thoroughly examined, and there is little research which describes the interactions between coaches and participants. This project is innovative because it examines the process and effectiveness of trained peers in providing weekly telephone coaching to persons with type 2 diabetes for a six-month period. In addition, the study also examines the sustainability of such changes at 12 months.

Project purpose

The primary purpose of this project was to evaluate the feasibility, viability, effectiveness, process and sustainability of using peer health coaches to assist persons with type 2 diabetes who were experiencing challenges managing their diabetes. Four main areas of research were investigated, namely:

- 1) The feasibility and viability of a telephone peer coaching program;
- 2) Effectiveness of peer coaching for persons with type 2 diabetes;
- 3) The influence of gender, age, education level and number of chronic conditions on program effectiveness; and
- 4) The process of peer coaching.

Target population

The target population was adults with type 2 diabetes attending a Diabetes Health Centre in the Fraser Health region of BC. This is BC's largest health region, encompassing 20 communities and containing over one third of BC's total population. It is the fastest growing health region of BC, has the highest age-standardized prevalence rate of diabetes mellitus in BC, and 38% of all British Columbians with diabetes live in this region. Two communities, Surrey and Abbotsford, have the largest proportion of persons with diabetes among all these communities. In the eastern part of the region, significant proportions of the communities are in the lowest quintile of socioeconomic circumstances (i.e., Hope >75%, Mission, Abbotsford, Chilliwack >35%). Surrey has 25% in the lowest socioeconomic quintile, while New Westminster has 21%. Between 2001 and 2006 the immigrant population in Fraser Health grew by 82,405. Nearly 50% of the region's population report overweight or obese BMIs. In Fraser Health, there is a steadily growing waitlist and wait time for people to access Diabetes Health Centres, and only 49% of those with type 2 diabetes have two or more A1C tests.

Description of project

Fraser Health Diabetes Health Centres provide client care through three visits. The first visit usually involved a comprehensive assessment and in subsequent visits clients received diabetes education. On average, half the clients attended all sessions, and referral to community resources and follow-up care with diabetes staff was rarely arranged. Diabetes education staff do not have the time nor resources to provide ongoing behaviour change counselling and support. The result is that clients did not have the knowledge, skills, confidence, or supports required to manage diabetes and the situation is accentuated when they are from a variety of cultural communities or are of lower socioeconomic status. An episodic six-hour provision of knowledge-based education did not prepare clients to effectively manage the ongoing and complex behaviours required to manage diabetes. As well, the health care system is not designed to provide an extended period of support due to a shortage of time and resources and an entrenched system design.

Peer coaches can assist clients to implement and sustain the behaviours they need to manage on an ongoing basis beyond or outside of formal diabetes education. Involving peer coaches is innovative as it “taps” the largely untapped resource of community peer support and can be cost-effective. This concept is important because new models of health care delivery are needed to meet the growing demand for diabetes services in a cost-effective way. Fraser Health diabetes clinicians acknowledged the need for this extended continuum of service and endorsed the peer diabetes coach initiative.

This pilot project was a partnership between the 11 Diabetes Health Centres in the Fraser Health Region of BC and the University of Victoria - Self-Management BC Office. The Regional Manager of Diabetes Services, the study co-PI, had an instrumental role securing staff participation and continuing support for the initiative. Ethical approval to conduct the research in the Fraser Health Region was acquired from The Joint Fraser Health and University of Victoria Research Ethics Board. The initial plan was for the university to recruit and train 100 coaches from their roster of persons who had completed self-management program(s) in Fraser Health. Coaches would have type 2 diabetes or have family members with diabetes. One hundred and fifty subjects with type 2 diabetes would be recruited mainly by the diabetes educators. Eligibility criteria for clients included: adults with type 2 diabetes, currently attending a Diabetes Health Centre, ability to speak English, and disclosure to educators that they were experiencing difficulty managing.

As Fraser Health diabetes educators and administration had participated in the planning and implementation of the project, there were only a few challenges. The first challenge was that the team could not use RCT methodology to create an experimental and control group for analysis. Diabetes educators did not feel ethically comfortable recruiting clients experiencing difficulty with a chance they would not receive a coach. Subsequently, the project team decided to modify the methodology to a one-way repeated-measures analysis of variance with outcome measures obtained at baseline, 6 months, and 12 months. The second challenge related to proposed client eligibility of having A1C over 8% within the past 6 months, as clients’ records were not accessible. Again, the team deleted this criterion. In retrospect the baseline mean for clients was 8.35.

Coaches were required to complete a three-day training workshop provided by the university and community partners. The university partner developed a Diabetes Coach Handbook that explained and reviewed how to use self-management support strategies, provided an explanation of core elements that coaches would need to discuss with participants during each call and the use of a tracking method. Using the standard diabetes patient booklet entitled “On the Road to Diabetes Health”

(http://www.fraserhealth.ca/media/201605_On_The_Road_Diabetes_Health.pdf). A diabetes educator delivered a one-day session on type 2 diabetes. After completing the training workshop, each coach was paired with a participant and commenced weekly 30-minute telephone calls for a period of six months (26 weeks). Every two weeks a researcher would telephone the coaches to provide support, problem solve and ensure program fidelity.

A 40-member community advisory committee was established and met fifteen times to guide the project and offer community perspective. Committee membership consisted of diabetes educators, research team members from the university and Fraser Health, coaches, community health leaders and members of the pharmaceutical community.

Project timeline

This two and one-half year project, funded by the Lawson Foundation, began in September 2014 and was completed in March of 2017.

Research Questions, Methods and Results

Feasibility and viability of peer coaches

The foci of this research were to ascertain: 1) whether recruiting and training peer coaches feasible and viable; 2) if persons with type 2 diabetes accept a peer coach; and 3) if diabetes educators would recruit and refer their patients to the coaching program.

Different research methods were used to investigate each question. The first major question related to the feasibility and viability of recruiting and training peer coaches and then pairing them with persons with type 2 diabetes who were experiencing difficulty managing their condition. Process recording was used to address this question.

When the project was being planned the team estimated that 100 coaches were required. Coach recruitment was primarily through contact with persons who had led or participated in community self-management programs and through ads in community newspapers. The inclusion criteria included; a diagnosis of type 2 diabetes, being over 19 years old, being able to communicate in English and living in the Fraser Health Region. Those with serious kidney disease and mental illness were excluded from the study.

During the two-year project 224 persons expressed interest in becoming a coach. Of these, 109 completed baseline questionnaires and consent forms and completed one of 15 three-day coach training workshops delivered by the university and diabetes educators. Forty-one of these coaches had either taken or led a Stanford self-management program through University of Victoria, 60 had type 2 diabetes, 17 had family members or close friends with diabetes and 32 had experiences with other types of chronic conditions.

Over three days coaches were trained on using self-management and coaching skills. The self-management techniques were modeled after the 5As and Stanford approaches. Coaches were given a coaching manual, a community resources guide and a Fraser Health patient booklet entitled “*On the Road to Diabetes Health*” that provided general information on diabetes. Coaches were supported at several stages throughout their six-month coaching period, namely: in the training, during the bi-monthly coach check-ins and through participation in the advisory committee meetings. This insured the self-management values were reinforced throughout the coaching period which enhanced intervention fidelity.

Coaches and participants were matched by sex and as close proximity to age as possible. The research coordinator and research associate paired coaches and participants by discussing personality types and on what coaching style participants preferred (e.g., pushy or laid back). Coaches were instructed to contact their participant once a week for 6 months and engage in a weekly 30-minute telephone-delivered coaching session. The Coaches were also invited to attend quarterly Advisory Committee Meetings. Coaches were given a \$100 honorarium for their participation.

Meetings were held with staff at the 11 Diabetes Health Centres to discuss the initiative and acquire support. A total of 316 persons requested a coach; 200 were referred by diabetes educators. One hundred fifty-five persons completed the questionnaire and consent form and 115 were paired with a coach. Only three participants had led or taken a Stanford self-management program prior to their involvement in the study.

Eighty-five of the 109 coaches were then paired with participants and provided weekly coaching for a period longer than four weeks. The average number of weeks of the pairings was 23 weeks (SD=6). Over the project period, of these 85 coaches:

- 67 were paired with one participant,
- 13 with two participants,
- 3 with three participants, and
- 2 with four participants.

Analysis of this experience demonstrates that peer coaches can be recruited, trained, and paired with persons with type 2 diabetes for a 26-week period.

Effectiveness of peer coaching

Quantitative research was used to investigate effectiveness. Both clients and coaches completed questionnaires at baseline, and at six and twelve months. Questionnaires contained 14 outcome measures (i.e., A1C, Patient Activation Measure ²⁵, Diabetes Empowerment Scale ²⁵, self-efficacy to manage diabetes ²⁶, self-reported health ²⁷, fatigue and pain ²⁸, depression ²⁹, communication with physician ²⁸, medication adherence ³⁰, health literacy ³¹, emergency department visits and nights in hospital in the previous six months ²⁸). All measures have been previously tested for reliability and validity. In addition to the 14 outcome measures, five demographic variables (age, sex, race/ethnicity, years of education, and number of chronic conditions) were obtained for each participant and were used to assess any potentially differential effects of the program across time for different subgroups. For assessing these effects, factorial mixed analyses of variance with groups (e.g., based on sex ... etc.) as the between-subjects factor and time as the repeated measures factor were employed. Participants and coaches received \$25 each time they completed the questionnaires.

A one-way repeated measures analyses of variance (ANOVAs) was used to test the main hypothesis that the coaching program would improve the outcomes of the study participants from baseline to 6-month and 12-months. Both the participants and the coaches completed the questionnaires.

Results

The description of the 109 coaches and 115 participants (total N = 224) is shown in Table 1. The two groups are comparable in terms of the proportion of men and women, their living situations, and whether they had attended a diabetes patient education program (a series of classes), although the coaches had attended such a program on average 6.1 years ago compared with 4.2 years for the participants. They are also comparable in terms of their average ages but the age distributions did vary, with the coaches having a more even distribution than the program participants in that there were higher percentages of coaches in both the youngest and oldest age groups and most of the program participants (73.4%) in the two middle age groups between the ages of 51 and 70 years old. The two groups also differed in terms of their language – with English being the mother tongue for a higher proportion (81.7%) of program participants compared with 65.1% of the coaches – and education levels, with the majority of coaches (55.5%) having at least a post-secondary degree (16 or more years of education) while the majority of the program participants (66.1%) had 15 years or less.

Table 1. Demographic Description of the Two Groups of Study Participants

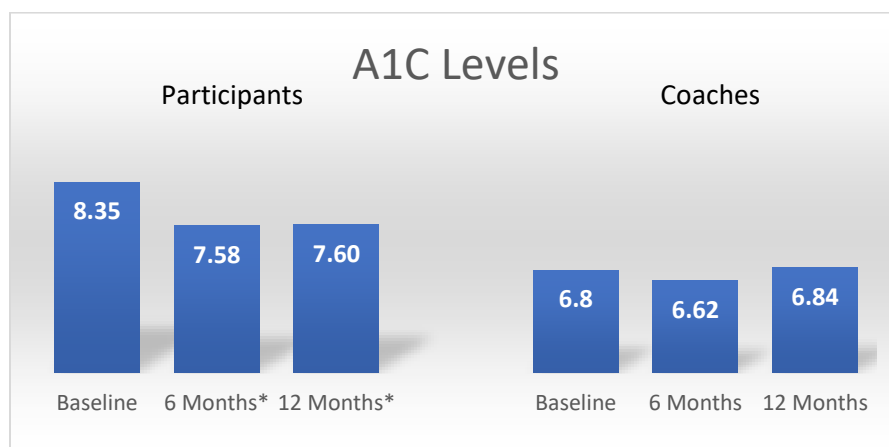
		Coaches (n = 109)		Program Participants (n = 115)		TOTAL (N=224)	
		N	%	N	%	N	%
Sex	Female	74	67.9	73	63.5	147	65.6
	Male	35	32.1	42	36.5	77	34.4
Age (in years)	Mean Standard Deviation	61.6 12.8		60.8 9.3			
Age Group	20 to 50 years old	22	20.8	17	15.0	39	17.8
	51 to 60 years old	20	18.9	38	33.6	58	26.5
	61 to 70 years old	33	31.1	45	39.8	78	35.6
	71 to 90 years old	31	29.3	13	11.5	44	20.1
Mother Tongue	English	71	65.1	94	81.7	165	73.7
	Punjabi	11	10.1	5	4.4	16	7.1
	Other	27	24.8	16	13.9	43	19.2
Education level	High School or Less (0-12 years)	14	12.8	36	31.3	50	22.3
	Some post-secondary (13-15 years)	34	31.2	40	34.8	74	33.0
	Post-secondary degree (16 years)	31	28.4	20	17.4	51	22.8
	Post-Graduate (17 or more years)	30	27.5	19	16.5	49	21.9
Living Situation	Lives Alone	24	22.9	28	24.4	52	23.6
	Lives with Others	81	77.1	87	75.7	168	76.4
Attended a Diabetes Patient Education Program?	Yes	52	81.3	92	80.7	144	80.9
	No	12	18.8	22	19.3	34	19.1
	If yes, how many years ago?	n=52 Mean = 6.1 (SD = 8.4)		n=85 Mean = 4.2 (SD = 4.6)			

In terms of overall health and diabetes, Table 2 shows that of the 109 coaches just over a half (55.1%) had diabetes themselves, and these coaches had been diagnosed with it on average 12.76 years prior to the study, compared with 8.9 years on average for the 115 program participants. The program participants self-reported considerably more chronic conditions, and were also on average about 10 kg heavier than the coaches.

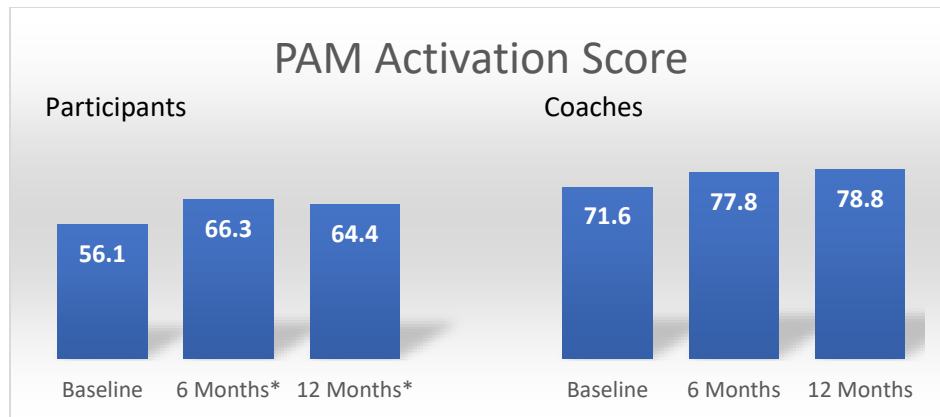
Table 2. General Health and Physical Description of the Two Groups

		Coaches (n = 109)		Program Participants (n = 115)	
		Number	%	Number	%
Who has Type 2 Diabetes?	Self	60	55.1	115	100
	Family/friend	17	15.6	0	0
	Other	32	29.4	0	0
Years since T2D diagnosis	N	58		113	
	Mean	12.76		8.91	
	Standard Deviation	12.51		8.38	
Number of Chronic Conditions including T2D*	None	23	21.1	0	0
	One	39	35.8	29	25.2
	Two	24	22.0	23	25.0
	Three	15	13.8	40	34.8
	4 or more	7	6.4	23	20.0
Height (in metres)	N	65		115	
	Mean	1.68		1.68	
	Standard Deviation	0.104		0.101	
Weight At Baseline (in kg)	N	65		115	
	Mean	82.1		92.2	
	Standard Deviation	25.9		22.0	
Note: (1) One coach was missing this information, therefore the percentages do not add to 100%					

Findings from the one-way repeated measures ANOVAs that assessed the impact of the coaching program on the various outcome measures over time showed that there were statistically significant improvements in six outcome measures: A1C, patient activation, diabetes empowerment, diabetes self-efficacy, depression, and communication with physician.

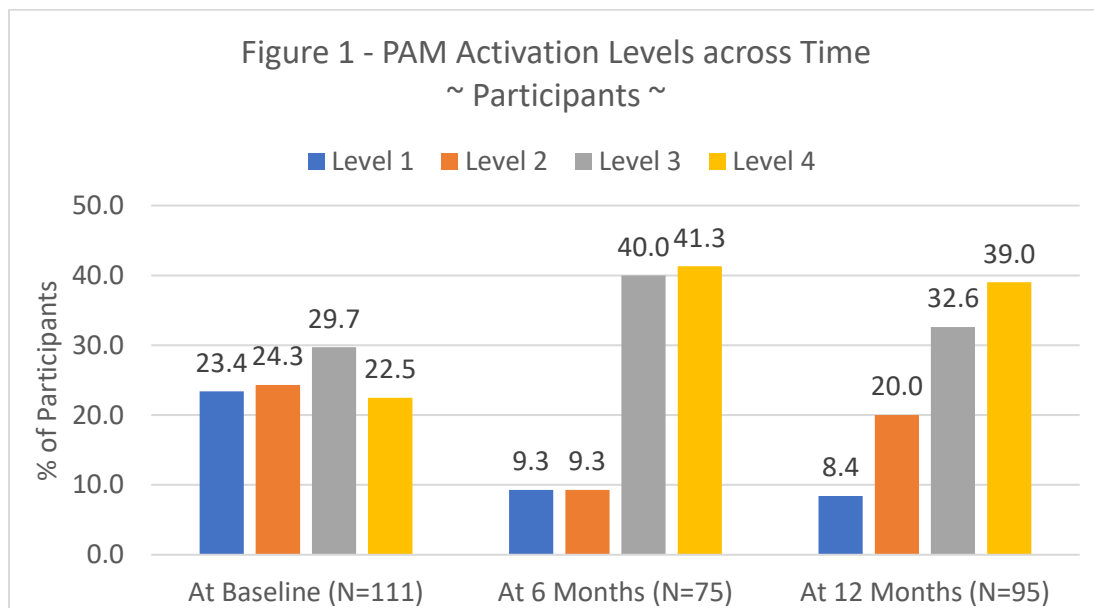


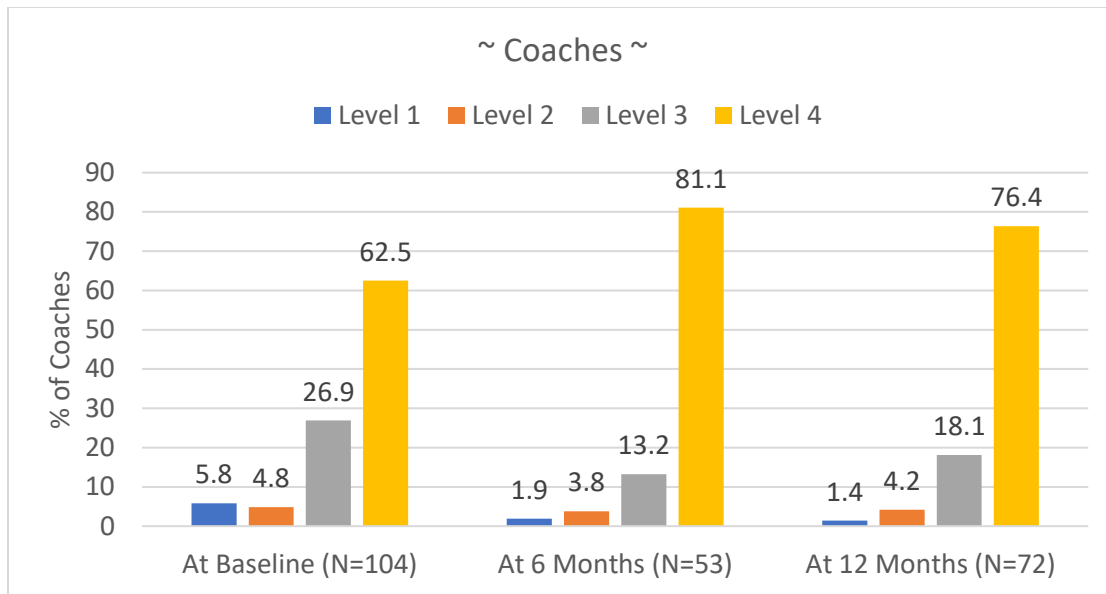
Participants' A1C levels dropped from an average of 8.35 at baseline to 7.58 at 6-months and remained at 7.60 at 12 months.



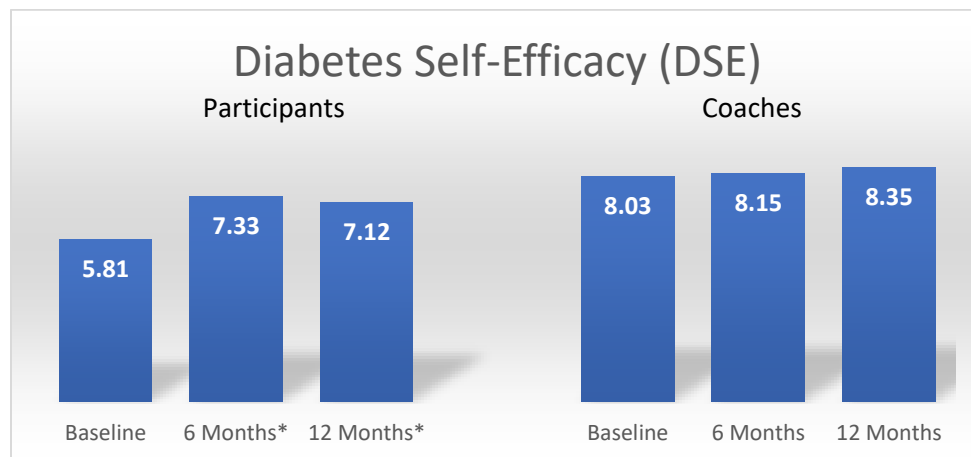
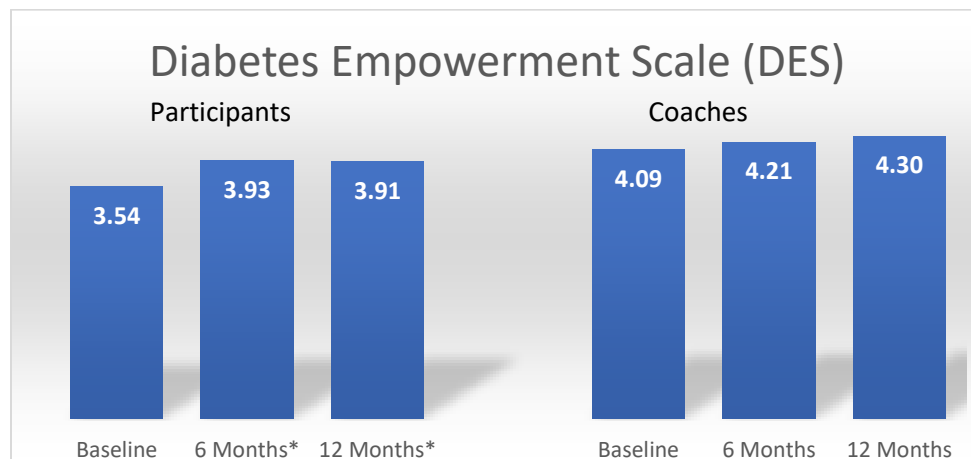
Patient Activation Measure (PAM) scores showed the transformed activation levels had increased from an average of 56.1 at baseline to 66.3 at 6 months and remained elevated at 64.4 at 12 months.

There was also an improvement in the number of persons at each activation level. For the program participants (Figure 1), the increase in the proportions of people at the higher PAM Activation levels at 6- and 12 months was statistically significant. Figure 1 shows that at baseline, the proportions of people were about equal across the four activation levels. At 6 months, the proportions at levels 3 and 4 rose while proportions at levels 1 and 2 dropped substantially, and remained elevated at 12 months, although some slippage back to level 2 was observed. In contrast, for the coaches (Figure 2), the test indicated that the proportions did not change statistically significantly although as shown in the bottom of the figure, there was a trend toward higher proportions at 6- and 12-months of coaches at level 4. Note also that almost two-thirds of the coaches (62.5%) were at the highest activation level at baseline already, and it appears that several coaches, particularly those at level 3, increased their activation level across time.

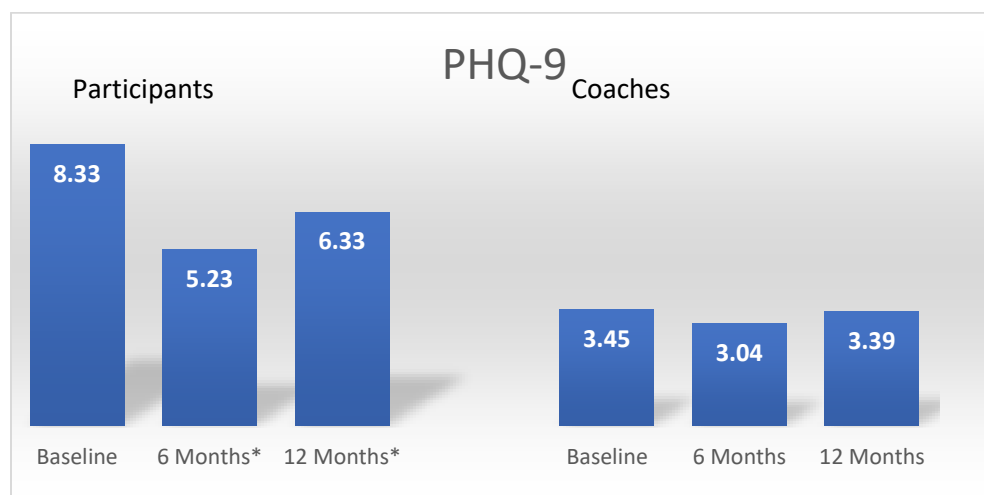




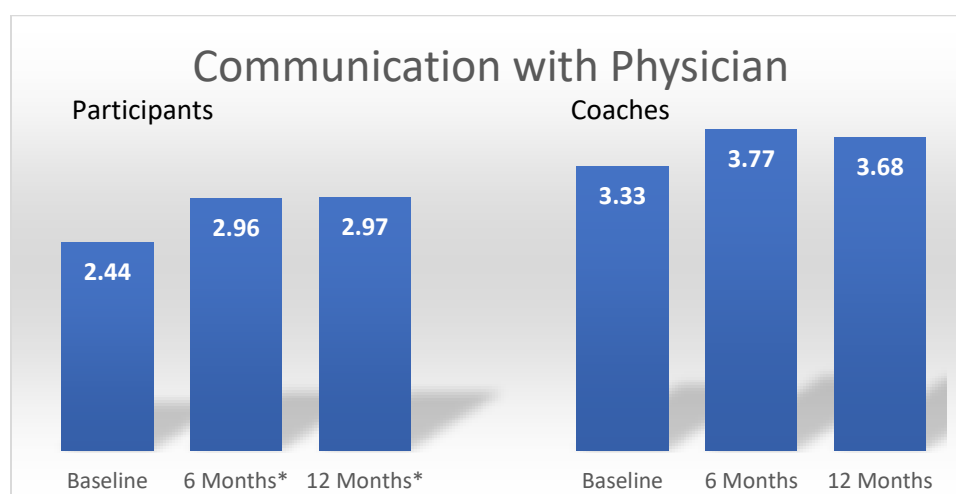
Diabetes Empowerment Scale (DES) scores increased from the baseline average of 3.54 to 3.93 and 3.91 at 6- and 12- months and Diabetes Self-Efficacy scores also rose from the baseline average of 5.81 to 7.33 and 7.12 at 6- and 12-months.



Depression (PHQ-9) scores decreased from 8.33 at baseline to 5.23 at 6 months and 6.33 at 12 months.



Communication with physician improved from an average of 2.44 at baseline to 2.96 and 2.97 at 6 and 12 months.



The remaining outcome measures did not seem to be affected by the coaching. These were: self-ratings of health, fatigue and pain, scores on the Morisky Medication Adherence scale, and the three items assessing health literacy. It should, however, be noted that although these outcome measures did not reach statistical significance, the changes in the mean scores were all in the predicted (better over time) direction when compared with baseline.

Additional variables related to general health – number of visits to the ER, number of visits to the doctor and number of nights spent in hospital – are summarized in the bottom of Table 3. For both groups, none of these measures changed statistically significantly over time.

The influence of covariates (i.e., sex, age, education level, and number of chronic health conditions) on program effectiveness

The effectiveness of the coaching program on different groups of participants, defined by sex, age, education level and total number of chronic conditions is explored next. In these analyses, a statistically significant interaction effect between time and a grouping variable (sex, age, education or chronic conditions) is of particular interest as this would indicate that the coaching program had differential effectiveness on different types of program participants.

The analyses found that the effectiveness of the coaching program was not influenced by sex (whether the participant was female or male), age (whether the participant was young or old), education level (number of years of formal education completed) and how many chronic health conditions participants were already experiencing.

The process of peer coaching

Grounded theory qualitative research was used to acquire a comprehensive understanding of how the peer coach intervention worked. This approach was used to explore how diabetes health coaches helped participants improve their diabetes management. The grounded theory method was chosen because it assists in describing a process over time and determining the social structures and patterns associated with that process^{32, 33}. In this case, we were interested in the process of peer diabetes health coaching. Constant Comparative Analysis was utilized to explore and compare coaching dyads with each other³⁴ and to develop themes.

The researcher conducted 13 coach “check-ins” with 40 coaches over the 6 month intervention period resulting in 520 fifteen-minute conversations (130 hours). As well, at the conclusion of the coaching period, semi-structured interviews with 29 participants were conducted. Constant Comparative Analysis was used to relate data to ideas and then ideas to other ideas.

The data collection and analysis occurred in five phases. The data collection, note taking, coding, memoing and sorting/writing was an iterative process throughout the progression of the study.³⁵ Data was collected by research staff from 36 coaches (40 dyads as 4 coaches had two participants) during the 6 month coaching period via 13 bi-weekly semi-structured telephone check-ins. During the check-ins, coaches were asked what they discussed with their participant, how they supported them, what problems they helped them with, what self-management strategies they used and if they had any questions about coaching or coaching difficulties to report. The length of time for each check-in ranged between 7 and 30 minutes. They were audio recorded for reference and detailed notes taken during the conversations. The check-ins allowed the researchers to ensure fidelity of the pilot program and support the coaches with any questions or problems.

As well, semi-structured telephone interviews with 29 participants were conducted after their 6-month coaching period was completed. The participant interviews explored how and if having a peer diabetes health coach changed the way they managed their diabetes. A semi-structured

interview guide was used and the length of time for interviews ranged between 10 and 60 minutes. Participant interviews were audio recorded and transcribed verbatim.

Results

Peer coaches reported discussing several topics during the telephone coaching sessions, including: blood glucose, medication, foot care, sleeping, weight concerns, self-care, their relationship with healthcare professionals, life and other health issues. A description of the role of the diabetes health coach emerged in five main themes: 1) teaching self-management skills; 2) providing accountability; 3) giving encouragement; 4) pointing to resources; and 5) clarifying boundaries. Figure 1 represents the Diabetes Health Coaching Framework (or schema) developed from the qualitative analysis. It is a visual representation of how the program functioned.

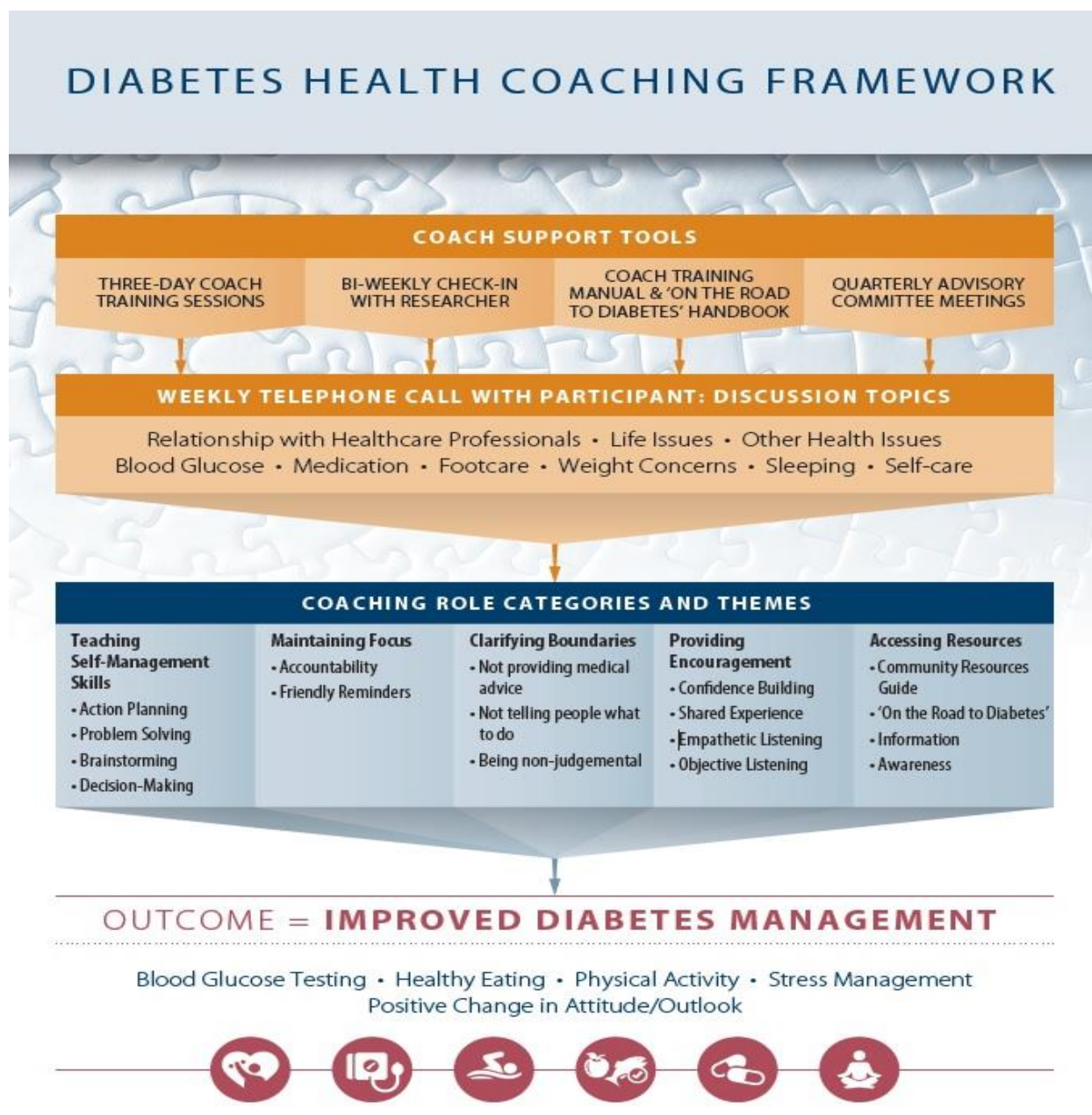


Figure 1 Diabetes Health Coaching Framework

Teaching Self-Management Skills

Diabetes coaches were trained to teach participants how to use self-management strategies (i.e., action planning, problem solving, brainstorming and decision-making) to assist them in managing diabetes. Brainstorming was used to identify gaps between where the participant was and where the participant wanted to be. The coach then helped the participant develop strategies and action plans to close the gap. The action planning process helped the coach to have the participant engage in more intentional thought on what behaviour changes they wanted to work on and how they wanted to accomplish this. The use of problem solving and decision-making

techniques were used to encourage the participant's own thought processes to identify solutions and actions.

Maintaining Focus

A key role of the coach was help their participant maintain their focus on diabetes management. This was especially relevant if they were currently in a caregiver role and were not accustomed or able to prioritize their own health. The participants appreciated having an accountability partner to report their progress or setbacks as it helped keep them on track. Coaches reminded participants of the things they wanted to accomplish and that they had the ability to successfully self-manage. Knowing their coach would be checking in on their progress was motivation to accomplish their weekly action plans.

Clarifying Boundaries

Clarifying boundaries early in the coaching relationship was essential in solidifying appropriate expectations between the coach and participant. Prior to joining the study, the project coordinator informed the participants that the coaches were not medical professionals. The coaches reiterated this fact to the participants and would not provide medical advice if asked. They avoided discussing specific medical issues and encouraged them to seek professional advice when appropriate. Instead, they promoted the use of self-management skills by not directing the participants but instead allowing them to take the lead, make their own decisions and find their own answers to questions. This inspired the participants to actively engage in and learn from the self-management process. Most of the participants indicated they felt safe speaking to the coach because there was no judgement involved. The coaches at all times tried to be supportive and non-judgmental of the client, their views, lifestyle and goals. This established a positive rapport and openness between the coaches and participant.

Providing Encouragement

Giving positive reinforcement by celebrating successes was a common technique used for encouraging the participant's progress and building confidence. The coach created a safe environment in which participants were able to analyze themselves and their situation; the coach did this by listening, asking focused questions, reflecting back, challenging, and acknowledging the participant. Continuing to encourage the participants to work through setbacks until success was achieved increased the participant's confidence in their own ability to self-manage. Learning and applying practical skills, such as problem solving, during coaching sessions ensured participants were able to not only identify the issues that were hindering progress but produce their own solutions to overcome them. Participants reported benefiting from having a shared experience. The participants reported no longer feeling alone in their diagnosis due to the value of having an ally who understood the daily challenges. Linking the participant's experience with the coach's experience opened up a new dimension for many of the participants who had not received this type of support in the past. In fact, many reported negative instances with healthcare providers who could not relate. The coaches filled a support gap between medical appointments and everyday life. Coaches acted as both empathetic and objective listeners. They empathized with the participants struggles yet at the same instance were objective. This objectivity was appreciated by many of the participants who often felt their family members and

friends were too emotionally invested in their diabetes management leading to sensitive interactions that left them feeling drained. Their family and friends could not relate to their experience; therefore, participants found it difficult to engage them in meaningful conversations about diabetes.

Accessing Resources

Providing information on available resources was a crucial part of coaching. The coaches were given a community resources guide for people with diabetes focused on the Fraser Health region. The guide outlined current programs available in the community which was a reference point to assist the participant in finding resources. The resources supported the participant in accomplishing their health goals such as where to find credible medical information, a list of available exercise classes in their area or mental health support lines. Coaches and participants were also given a handbook entitled “*On the Road to Diabetes Health*” which outlined general medical facts about type 2 diabetes. If medical questions were raised by the participant during the coaching sessions the coach referred them to specific sections of the handbook and encouraged the use of this resource. Coaches also passed on general information on diabetes and created awareness about different techniques or issues around diabetes management. For example, prompting participants to ask their doctor for a foot exam during their check-ups, teaching them how to read food labels (using “*On the Road to Diabetes Health*”) or discussing the importance of eating meals at regular intervals. The participants indicated the information given by the coaches was easier to understand and digest.

OUTCOME - Improved Diabetes Management

The interactions between the coach and participant (the coaching role) shaped the process of coaching and resulted in participants reporting improved diabetes management behaviour changes which included: more consistent blood glucose testing, healthier eating and food choices, increased physical activity, improved stress management, better sleep practices and positive change in attitude or outlook.

Discussion and Limitations

This longitudinal pilot study used different research methods to examine the implementation and effectiveness of a peer-led telephone intervention for persons with type 2 diabetes who were experiencing challenges and stress in daily management. A review of the processes used to recruit and train the coaches and determine participants' interest demonstrates that the concept is both feasible and viable. Regarding the effectiveness of the coaching intervention, six outcome measures improved from baseline to six months and were maintained at 12 months, namely: A1C (-9%); patient activation (+15%); diabetes empowerment (+10); self-efficacy (+23%); depression (-24%) and communication with physician (+22%). In addition, these outcome measures were not influenced by covariates of sex, age, education level, and the number of chronic health conditions participants were experiencing.

In the study, A1C level was the primary health outcome and was measured at baseline and at 6 and 12 months. At six months, there was a mean reduction in A1C level of almost 9% and at 12 months the mean A1C levels still maintained the 9% decrease from baseline without any type of reinforcement. This study did not have a control group, however the findings are consistent with findings of other studies which measured the impact of peer support in improving glucose control in patients with type 2 diabetes.^{14, 16-20, 22, 36}

Importantly, the peer coaching was able to bring about improvement in other important areas, namely depression and activation levels. Depression was measured by the PHQ-9²⁹ and a score of 10 or higher indicates major depression. At baseline the mean depression score was 8.33, but at six months the score had decreased to 5.23 and to 6.33 at 12 months. Since individuals with diabetes perform the vast majority of routine daily care, self-care represents a critical element in diabetes management. However, studies consistently show that co-morbid depression in diabetes is associated with poorer self-care and non-adherence to diabetes management,³⁷ leading to increased episodes of hyperglycaemia, microvascular and macrovascular complications, and an associated increase in morbidity and mortality.^{38, 39}

Another important change was in activation level. The Patient Activation Measure²⁴ has been shown to be an important surrogate measure for several outcomes. Activation refers to people's ability and willingness to take on the role of managing their health and health care. The Patient Activation Measure (PAM) was designed to assess an individual's knowledge, skill and confidence in managing their health.

Systematic reviews of evidence on the performance of the PAM conducted by the National Health Service in 2012 and 2014^{40, 41} found that: activation scores have been robustly demonstrated to predict a number of health behaviours and individuals with higher PAM scores were significantly more likely to exhibit healthy behaviours; the relationship between patient activation and health outcomes has been demonstrated across a range of different populations and health conditions; PAM scores are closely linked to clinical outcomes, the costs of health care and patients' ratings of their experience and to report higher levels of satisfaction with services; and PAM scores were strongly associated with improved adherence to treatment, with doctor-patient communication; and with increased patient participation. The PAM has been used extensively in health care research with results published in numerous journals

(<http://www.insigniahealth.com/research/archive/>). A 2016 systematic review of the association between patient activation and medical adherence, hospitalization, and emergency room utilization in patients with chronic illness found that patient activation is associated with reduced hospitalization and emergency room utilization.⁴²

Behaviour change, and specifically changing diet and physical activity behaviour is one of the cornerstones of diabetes treatment, but changing behaviour is challenging. In a recent systematic review and meta-analysis by Craddock and colleagues⁴³ the researchers found that combined diet and physical activity interventions achieved clinically meaningful reductions in A1C at 3 and 6 months, but these were not sustained at 12 and 24 months, thus showing the difficulty in maintaining initial reductions in A1C over time.

In this pragmatic study, improvements in A1C and other health outcomes were sustained without reinforcement at 12 months (6 months post intervention), a noteworthy achievement rarely seen in other studies.

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For a more detailed description of the research please click on the following link

<http://www.selfmanagementbc.ca/uploads/Research/Diabetes%20Health%20Coach%20Study%20Final%20Report%20January%202018.pdf>

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