

Acceptability and Satisfaction With a Telecarer Approach to the Management of Type 2 Diabetes

ANDREW F. LONG, BA, MSC, MPHIL¹
TINA GAMBLING, BSC, MSC, PHD²
ROBERT J. YOUNG, MD, MMSC, FRCP³

JEAN TAYLOR, RGN, MA³
JAMES M. MASON, BSC, MSC, DPHIL⁴
ON BEHALF OF THE PACCTS TEAM

OBJECTIVE — To examine patients' views of the acceptability of and satisfaction with telephone care center support provided to improve blood glucose control in type 2 diabetes.

RESEARCH DESIGN AND METHODS — The Pro-Active Call-Center Treatment Support (PACCTS) Trial randomized patients from 47 general practices in a deprived urban area in northwest England to usual care or to proactive call center support in addition to usual care. Satisfaction with care was assessed in all 591 patients at baseline and the end of the study using the Diabetes Satisfaction and Treatment Questionnaire (DTSQ). Acceptability was assessed in 394 intervention patients after at least three proactive calls from the call center and at the end of the trial. A purposive sample of 25 patients took part in in-depth semistructured interviews.

RESULTS — The response rates to the questionnaires were 79% (DTSQ) and 65% (acceptability). Persons receiving the intervention continued to report high levels of satisfaction with their treatment (95% CI 32.3–33.2 at 1 year), and >90% strongly agreed or agreed that the telecarer approach was acceptable. Qualitative comments pointed to the importance of a personalized service; increased feelings of well-being, including confidence and self-control; help with problem-solving; and patients developing rapport and a strong bond with the telecarers.

CONCLUSIONS — A personalized PACCTS approach is acceptable to patients. A service giving priority to the interpersonal dimension leads to increased commitment from patients to improve long-term glycemic control.

Diabetes Care 28:283–289, 2005

The U.K. Prospective Diabetes Study (1) has demonstrated the beneficial effects of maintaining good glycemic control in type 2 diabetes. Individualized patient education that empowers patients to make informed choices about glucose

control (2–4) is likely to improve the outcome of care for people with type 2 diabetes. This is echoed in the U.K.'s National Service Framework for diabetes (5), which advocates a “supported self-care service model” founded on education

to facilitate self-management. The National Institute of Clinical Excellence (6) (England and Wales) has recommended structured patient education to be made available to all people with diabetes on diagnosis and then as required.

Interactions focused on patient concerns are consistently associated with increased patient satisfaction, reduction in anxiety, and improved physiological status (7–11). However, there is a lack of consensus as to the exact meaning of patient centeredness (12) and its desired outcomes, including, for example, an enhanced therapeutic relationship (13), patient satisfaction (14), patient enablement (15), and self-efficacy (16). Effective measurement of the acceptability of an intervention needs to be multidimensional and, in particular, to move beyond global measures of satisfaction to ascertain if and how the intervention has influenced behavior.

Care and support provided over the telephone may potentially be an efficient method of providing patient-centered diabetes care (17). A review of the literature (18) concluded that telephone and computer communication improves the clinical health care process, patient outcome, compliance with medication, and reduction of foot lesions. Piette et al. (19) found that improvements in self-care and glycemic control as well as decreased symptom burden were achieved with an average of 6 min per month of nurse-patient contact over the telephone. However, little research has been conducted on the acceptability of such systems to the patient and factors contributing to changing behavior.

The randomized controlled trial of a proactive call-center treatment support (PACCTS) system for persons with type 2 diabetes (20) provided an opportunity to explore this further. The guiding research questions were to explore whether PACCTS was acceptable to patients, to identify factors that contributed to behavioral change, and to confirm that patients remained satisfied with their treatment. PACCTS was delivered by two telecarers supported by a diabetes specialist nurse

From the ¹Health Care Practice R&D Unit, University of Salford, Salford, U.K.; the ²School of Health Care Studies, University of Cardiff, Cardiff, U.K.; ³Diabetes & Endocrinology, Hope Hospital, Salford, U.K.; and the ⁴School for Health, University of Durham, Stockton-on-Tees, U.K.

Address correspondence and reprint requests to Prof. Andrew Long, Health Care Practice R&D Unit, University of Salford, Allerton Building, Frederick Road Campus, Frederick Road, Salford M6 6PU, U.K. E-mail: a.f.long@salford.ac.uk.

Received for publication 27 September 2004 and accepted in revised form 20 October 2004.

A.F.L., T.G., and J.M.M received an unrestricted academic (subcontract) grant from Salford Hope Hospital to provide research support for the PACCTS Study. Funds originated from the study sponsors: Glaxo Smith Kline and British Telecom.

Abbreviations: DTSQ, Diabetes Satisfaction and Treatment Questionnaire; PACCTS, proactive call-center treatment support.

A table elsewhere in this issue shows conventional and Système International (SI) units and conversion factors for many substances.

© 2005 by the American Diabetes Association.

The costs of publication of this article were defrayed in part by the payment of page charges. This article must therefore be hereby marked “advertisement” in accordance with 18 U.S.C. Section 1734 solely to indicate this fact.

Patients received calls, scheduled for 20 minutes at a pre-arranged date and time, related to their level of blood glucose control:

- Those with 'poor' initial control (HbA_{1c} more than 9%) received one proactive call per month
- Those with 'moderate' control (HbA_{1c} 7.1-9%) received one proactive call every 7 weeks
- Those with 'good' control (HbA_{1c} 7% or less) received one proactive call every 3 months

Interim follow-up calls were arranged if required. Following referral from the telecarers, calls were made by the supervisory diabetes specialist nurse for urgent issues (for example, unexplained hypoglycemia) or for routine supplementary counselling and medication change. Patients were also requested to keep self-management logs of blood glucose levels and relay these back to the telecare staff during the calls.

Figure 1—The telecare stepped call approach.

(herself supervised by the consulting physician) and aimed to support and guide the patient as an individual toward achieving the best possible management of his/her diabetes. The patients received calls in a frequency inversely proportional to their level of blood glucose control (Fig. 1). Each scheduled call comprised protocol-based and computer software-supported sections about knowledge of diabetes, readiness to make changes, medication adherence, and measurement of glucose control.

RESEARCH DESIGN AND METHODS

The study formed part of a 1-year randomized controlled trial to assess the effectiveness of the PACCTS intervention (20). A total of 591 patients were recruited and randomly assigned in a 2:1 ratio to the intervention and control group. All patients gave their informed consent, and ethical approval for the study was obtained from the local research ethics committee. The primary outcome variable was the level of glycemic control (HbA_{1c}).

Satisfaction with treatment was measured in both the intervention and control groups at baseline and the end of the study using the validated Diabetes Satisfaction and Treatment Questionnaire (DTSQ) (21). The DTSQ, a measure of satisfaction with treatment, is a self-report measure and has eight items, each scored on a seven-point scale (0–6). The first six items form a satisfaction with treatment score, ranging from 0 to 36, which is used here. Acceptability was measured by a purposely designed, 24-item postal questionnaire and administered to the intervention group after the patient had received at least three proactive calls from the call center and at the end of the trial. The instrument

comprised 20 statements exploring different aspects of the call center (each scored on a five-point scale, with an extra “don't know” box) and four open-ended questions asking about advice and support provided, perceptions of control, additional follow-up advice required, and any further comments.

To look in greater depth at any behavior-changing effects of the intervention, 25 patients took part in an in-depth semi-structured interview. In total, 30 patients were approached, with 5 refusing due to holiday or other commitments during the 2-week interview period. The patients were theoretically sampled from four groups according to their baseline and end-of-study HbA_{1c} results: those whose control remained either “good” or “poor” and those whose control improved or deteriorated. The interviews explored the content of the intervention, changes in attitudes and behavior, and the mechanisms and context for changes. All the interviews were tape recorded and transcribed verbatim.

Quantitative data were analyzed using SPSS for Windows, with significance levels set at 5%. Given the ordinal nature of the data, the Mann-Whitney *U* test was used to assess differences in satisfaction levels between groups, Wilcoxon's signed rank test for differences within groups, the χ^2 test to explore age, sex, or other structural differences, and Spearman's ρ for correlations. The open-ended acceptability questions were read through and grouped into three thematic areas: service-related factors supporting or leading to change; coping and other personal factors that enhanced coping; and self-knowledge, attitudes, and behavior (22).

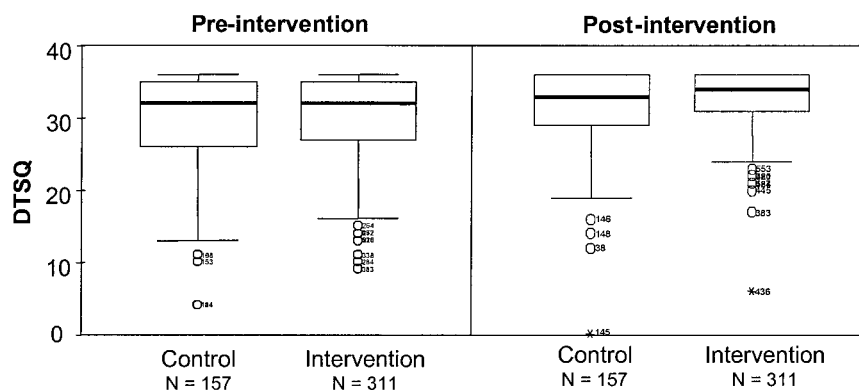
RESULTS

Loss to follow-up

There were similar numbers of withdrawals in the intervention and the control groups due to death, moving from the area, further serious illness, relative's illness, or loss of contact (10.1 vs. 10.7%, respectively). In the intervention group, an additional 22 (5.6%) dropped out for call center-related reasons, such as not being able to cope with the calls ($n = 8$), being unhappy with the advice given ($n = 4$), traveling ($n = 3$), changing their mind ($n = 3$), or being too busy ($n = 2$).

Satisfaction

A total of 468 persons responded to the pre- and post-DTSQ for a response rate of 79%. Respondents were a median age of 67–68 years, had had diabetes for a median of 7 years with just over half being male (57% in the intervention group vs. 58% in the control group), and the majority came from localities with a Carstairs deprivation score of 4 or 5 (85% in the intervention group vs. 83% in the control group). There were no statistically significant differences between the control and intervention groups for age, sex, time since diagnosis, or Carstairs score. Both groups had high and nonstatistically significantly different levels of satisfaction before the intervention (95% CI 28.8–30.9 in the control group vs. 29.6–30.9 in the intervention group) (Fig. 2). By the end of the trial satisfaction, levels had increased in both groups (30.6–32.3 vs. 32.3–33.2 in the control and intervention groups, respectively), and there was statistically significant difference between the intervention and the control group ($z = -2.266$, $P < 0.023$).



Contrast	Z value	p value
C _{pre} vs. I _{pre} ¹	-.145	.885
C _{post} vs. I _{post} ¹	-2.266	.023
C _{pre} vs. C _{post} ²	-2.723	.006
I _{pre} vs. I _{post} ²	-7.497	.000

1. Mann-Whitney U test
2. Wilcoxon Signed Ranks test

Figure 2— Stem and leaf plot and test values for satisfaction scores (DTSQ).

Acceptability

Two hundred users responded to the initial and end-of-study acceptability ques-

tionnaire (a response rate of 65%). They had a median age of 69 years, had had diabetes for a median of 7 years, and 42%

were female. The responder characteristics mirrored those of the intervention group as a whole.

General acceptability and feelings of control

At follow-up, >90% of respondents strongly agreed or agreed that the PACCTS approach was acceptable. Specific responses related to friendliness, helpfulness, convenient call scheduling and duration, knowledgeable staff, personally relevant call content, and useful, personally tailored advice (Table 1). In addition, >90% strongly agreed or agreed that PACCTS improved their knowledge of diabetes, control of diabetes, and general well-being. There was an age variation, with younger persons feeling more knowledgeable ($\chi^2 = 39.1, df = 25, P = 0.035$) and more in control ($\chi^2 = 41.0, df = 20, P = 0.004$) after PACCTS.

Different comments predominated in the initial (after three proactive calls) and the end-of-study questionnaire. In particular, there was a noticeable shift from comments about attitudes to (13 vs. 4%, respectively) and knowledge of (19 vs. 11%) behavior (16 vs. 21%). At the end of the trial, patients talked in terms of “everything has been explained to me,”

Table 1—Ratings of acceptability of the call center approach

Aspect addressed	Strongly agree	Agree	Not sure	Disagree	Strongly disagree	Don't know
Friendly and helpful	62	38				
Appropriate call timing for me	50	49				
Staff knowledgeable about diabetes	61	37			1	1
Staff provide me with useful advice	53	44	2		1	
Like telephone contact for specialist advice	53	38	8		1	
Amount of time on phone acceptable	39	59	2			
Happy with the care received	49	47	3		1	
Easy to understand advice	48	51	1			
Advice sufficient and meets my needs	42	54	4			
Sufficient time to ask further questions and seek more advice	51	47	1		1	
Talk about relevant things to me	53	44	2			
Acceptable to receive phone advice	41	53	4	2		
Feel much better after receiving the advice from the call center	43	51	4	1		1
Feel more knowledgeable about my diabetes now	36	56	6	1		1
Have taken on board the advice given me so far	38	59	1	1		
Feel more in control of my diabetes	39	50	9	1		
Prefer to see health professional	7	14	25	43	5	5

Data are percent. Values <1% are not shown; the total may be >100% due to rounding.

Downloaded from http://diabetesjournals.org/care/article-pdf/28/2/283/666042/zdc0020500283.pdf by guest on 23 June 2024

'You ring the call centre, the chances are it's going to be XX (name of tele-carer). She knows how you've been over the past months and she's got all your readings there.' (an improver)

'Because I've got a direct contact number for XX (tele-carers) whereas, before, the number that I had for Hospital Y you might get a tape recorder, an answer service.' (an improver)

'My call centre young lady, XX, ...she is very easy to talk to and she brings everything out of me.' (an improver)

'The information is aimed directly at me and not as a (general) rule.' (an improver)

'I find it very helpful and it is quite reassuring that there is somebody there that knows quite a lot about it and can sort of put you ... right ... if you've find you are doing something wrong.' (an improver)

'When this happened to my ankle and my blood sugars shot up, I didn't know why it was shot up, I just couldn't understand it and that's when it (PACCTS) became even more important, yes.' (a continued 'poor' controller)

'About two or three month ago, I was getting a lot of hypos... (The specialist tele-care nurse) told me to start reducing my morning insulin by two units until I started getting higher numbers again. When I achieved them I would cut it off and take that every morning, leave the afternoon one the way it was like.' (an improver)

'I feel more at ease with ringing the call centre because I hear from someone on a regular basis.' (a continued 'poor' controller)

'I've found it very, very helpful.... I've wrote some thoughts in my book. I would have been absolutely lost without XX (the tele-carers).' (a continued 'poor' controller)

Figure 3—Bonding with the telecarers.

“changing my attitude,” “giving the opportunity to ask questions,” or “seek advice” and it being “the little things that they have told me that have made the big difference.”

When asked whether they would prefer to see a health professional rather than receive telephone calls about diabetes, 21% either agreed or strongly agreed and 5% did not know. Exactly half of the respondents disagreed or strongly disagreed, suggesting substantial support for the telephone approach. Four-fifths indicated that their expectations of PACCTS had been met totally or to a great extent, with younger persons being significantly more likely to respond positively ($\chi^2 = 34.0$, $df = 20$, $P = 0.025$), and 90% were highly or largely satisfied with the recommendations that the telecarers had given them.

Moderate to strong correlations (Spearman's $\rho = 0.42$ – 0.59 , $P < 0.01$) were evident between perceptions of the acceptability of receiving advice by phone, feeling able to act on the advice given, feelings of control, expectations of the intervention, and satisfaction with the intervention. These data support a behavioral model in which the provision of an acceptable service leads to improvements in knowledge and feelings of control.

Relationship with the telecarer

Approximately 25% of the questionnaire respondents highlighted aspects of the service that were important to them. These included staff being knowledgeable, polite, efficient, helpful, and friendly; the value of regular contact; and satisfaction with the service and advice given. The patients highlighted that a relationship and bond had been formed with the telecarers. Just under half (45%) of the respondents' comments concerned coping, caring, and comforting. For instance, they mentioned someone providing care and comfort, “stopping you feeling isolated,” a personalized service including incentives and reminders, and feelings of mental well-being—embracing confidence, seeking advice, self control, being happier and more positive and not panicking.

In the interviews, patients, particularly those with poor baseline control and, thus, those who received the most frequent calls, spoke of their close rapport with the telecarers (Fig. 3). They commented in terms of “speaking to the same one,” using first names, and sharing jokes. The telecarers provided personalized and expert advice and helped the patients problem solve. Some patients pointed to the help given when other illnesses or health crises had affected their blood glucose control. More generally, the telecarers were described as

“more personal” and “a bit more caring.” The fact that there was someone at the end of the phone enhanced confidence. The regular calls, made at convenient prearranged times (“no restrictions on your life with them ringing; they ring to suit you”) also encouraged direct calling by the patient for advice. As one patient put it, “you don't feel that you are calling a call center because you identify the person at the end of the phone.”

Consciousness raising

A second thematic area, mentioned by ~33% of all respondents to the acceptability questionnaire, related to enhanced self-knowledge and changes in attitudes and behavior. The in-depth interviews explored this further. Here interviewees commented that the advice given was personalized and tailored to their own lifestyle needs to, for example, accommodate shift working or someone who wished to incorporate exercise into their daily routine. The telecarers asked pertinent questions and helped the patients establish realistic goals.

Initially there was a process of consciousness raising. With the patient, telecarers addressed specific areas of diabetes management (Fig. 4). Diet and exercise were the most common areas mentioned (10 of 25 patients). Respondents spoke in terms of “becoming more aware of what I

Diet and Exercise

'(It) helped with weight, helped with diet and things like that. (Before) we weren't getting much information about diet really... (And) exercise.' (a continuing 'good' controller)

'So it was ZZ (diabetes specialist nurse) that explained that to me and I've gradually over this last twelve months... I've lost about a stone in weight and... it's really, really been difficult...: They've explained to me the importance really of diet.' (an 'improver')

'Well it has helped me to understand it better. I feel more confident and I am much more aware of what I'm eating food-wise and it just helps me to...I have learnt to control it.' (an 'improver')

Understanding Blood Readings

'Well they asked me to do my blood at different times. But I seem to be set in my ways to do it just before I have my breakfast and the next after breakfast and so on' (a continuing 'good' controller)

'I think it is important because I've learnt to realise now when my blood sugar is low, I'm not very good at "high" but I can recognise it when it is low.' (an improver)

'My blood sugar levels were going up at certain times ... so we adjusted it so instead of doing it before breakfast before lunch, before evening meal and before bed.' (a continuing 'poor' controller)

'My diabetes control is not as good as it should be but I'm a lot more aware of what it should be.' (a continuing 'poor' controller)

General Awareness

'It's made me aware of what to do and how things affect you' (a relapsing 'good' to 'poor' controller)

'Everything has been explained to me... Even if I didn't know that I was doing something wrong, (the tele-carer) would pull me up and say, "really, you should be doing this." And then explain it to me why I should be doing it.' (an improver)

'I feel more knowledgeable. I can't explain it really. I feel more confident about the whole thing really, yes. I don't know whether I feel more in control.' (a continuing 'poor' controller)

'Whereas you get more detail, you know, things you know you thought you knew but you didn't.' (a continuing 'poor' controller)

Figure 4—Awareness raising among the intervention group.

eat," "they go on at me about diet," "being more careful what you eat," "keeping your weight down," and to eat "more carbohydrates." A second main area related to comments about when to measure their blood glucose levels and the interpretation of the readings (mentioned by eight persons).

CONCLUSIONS— If a patient-centered care service is to be achieved, then user perceptions of the acceptability and satisfaction are essential. A combination of methodological approaches needs to be used and tailored to the intervention, ideally incorporating validated measures used in other studies (to enable cross-study comparison), using purposely designed instruments, and including in-depth interviews with participants (23).

This study has demonstrated that the PACCTS intervention provides a continuing satisfactory service to patients, dem-

onstrated by the small loss to follow-up and increased levels of satisfaction, significantly more so in the intervention than the control group. This difference could be explained by the increased contact of patients with care providers via PACCTS. While it is well known that the measurement of satisfaction is prone to bias (24), with results varying in relation to what the patient is asked and how, the DTSQ is widely used in evaluations of diabetes interventions. Interest here lies in eliminating the possibility that PACCTS led to reduced satisfaction. Assuming comparable biases in the intervention and control groups in the measurement of satisfaction, this is amply evident. The qualitative component of the study helps to clarify the complex causal chain between changes in knowledge, attitudes and behavior, and health status. Our data suggest that PACCTS supported improved knowledge through a process of con-

sciousness raising and supported problem solving as recommended by the National Institute for Clinical Excellence (6) and the National Service Framework (7). It is possible that some of the reported behavioral changes and observed clinical changes (20) could be due to an "expectation" effect; that is, a change in behavior arising from the expectation of a call and the monitoring of glucose control, as opposed to adoption of the changed behavior into everyday life. Other parts of the interview data confirm that the expectation of a call did encourage glucose testing and behavior change. For those who changed their HbA_{1c} group status, for example, from "poor" to "good," there was however evidence of an effect beyond expectation—adoption of the message of the need for better blood glucose control. Indeed, other studies have also demonstrated beneficial effects of empowerment-based interventions, illustrating

early improvements in HbA_{1c}, a decline at 6 months, and subsequent sustained improvements at 1-year follow-up (25). Teaching self-management skills is recognized as insufficient to bring about changes in behavior; patients need to learn these skills in everyday life (26). Exploration of a longer-term effect and closer examination of causal patterns remains an important next step in the research.

The PACCTS system operated at least at two levels: 1) proactively with the telecarer initiating calls, helping the patient to review glucose control and management, and providing the education and motivation aimed at effective management; and 2) as a decision support tool for the patient, who was able to call the telecarer when needed for specific advice or help in problem solving. The telecare workers used a structured questioning approach, working with patients to develop solutions and providing feedback and encouragement, that prompted patients to identify their own problems. PACCTS support made the patients more knowledgeable and aware of their diabetes and more confident in their ability to manage and control their diabetes. For many this occurred only at a cognitive level during the study, while for some it translated into behavioral change that resulted in improved glucose control.

These results suggest that several processes can contribute to a successful patient-centered telephone-supported disease management. These processes include listening to and focusing on the concerns of patients, individualized problem solving, and continuity of care over time. It may not be the information provision per se that is important (raising awareness and knowledge), but its provision in a context of enablement and support aimed at self-efficacy. The development of a strong bond between the patient and telecarer may play a major role in both the acceptability of the intervention and behavioral change. The interpersonal dimension also needs to be a major focus of further research.

Whether a system would be as acceptable as PACCTS or engender a similar level of bonding between telecarer and patient depends on faithful adoption of the model. PACCTS differs from other telecare systems such as National Health Service (NHS) Direct (27) in that contact is with a particular, not any, telecarer.

PACCTS placed significance on the interpersonal dimension as a key contributory factor to enabling behavioral change (28). This is reinforced by the fact that, although one of the original telecarers left during the 1-year trial, her replacement rapidly bonded with her patients. This was facilitated by a planned and progressive handover with the original telecarer telling the patients she was leaving and who would be replacing her. A weakness of the current study is its limited 1-year time frame; the sustainability of any change over time remains to be examined and research is ongoing. This is particularly important for an intervention aimed at enhancing confidence and skills and thus empowering patients to develop long-term self-efficacy. It would also be instructive to undertake in-depth interviews within each HbA_{1c} stratum early on in the intervention and toward its end with the same persons to gain further insight into the workings of the intervention.

Acknowledgments— This study was funded by GlaxoSmithKline and British Telecom. The opinions expressed are those of the authors and not necessarily those of the funders.

We thank all the patients who took part in the study.

References

1. United Kingdom Prospective Diabetes Study: Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patient with type 2 diabetes. *Lancet* 335:837–853, 1998
2. Walker EA, and Cypress MI: Self-monitoring: the patient practitioner alliance. *Nurse Pract Forum* 2:175–177, 1991
3. Faas A, Schellevis FG, Van Eijik JTM: The efficacy of self-monitoring of blood glucose in NIDDM subjects: a criteria based literature review. *Diabetes Care* 20:1482–1486, 1997
4. Butler RN, Rubenstein AH, Gracia AG, Zweig SC: Type 2 diabetes: patient education and home glucose monitoring. *Geriatrics* 53:60–67, 1998
5. Department of Health National Service Framework for Diabetes. London, Department of Health, 2002. Available at <http://www.doh.gov.uk/nsf/diabetes/>.
6. National Institute for Clinical Excellence: *Full Guidance on the Use of Patient Education Models for Diabetes*. London, NICE, 2003 (Technology Appraisal no. 60)
7. Anderson LA: Healthcare communication and selected psychosocial correlates of

- adherence in diabetes management. *Diabetes Care* 13:66–76, 1990
8. Funnell MM, Anderson RM, Arnold MS, Barr PA, Donnelly M, Johnson PD, Taylor-Moon D, White NH: Empowerment: an idea whose time has come in diabetes education. *Diabetes Education* 17:37–41, 1991
9. Kinmonth A-L, Spiegel N, Woodcock AJ: Developing a training programme in patient-centred consulting for evaluating in a randomised controlled trial: Diabetes Care from Diagnosis in British Primary Care. *Patient Educ Counsel* 29:75–86, 1996
10. Roter DL, Hall JA, Merisca R: Effectiveness of interventions to improve patient compliance. *Medical Care* 36:1138–1161, 1998
11. Williams GC, Freedman ZR, Deci EL: Supporting autonomy to motivate patients with diabetes for glucose control. *Diabetes Care* 21:1644–1651, 1999
12. Mead N, Bower P: Patient centredness: a conceptual framework and review of the empirical literature. *Soc Sci Med* 51:1087–110, 2000
13. Woodcock AJ, Kinmonth AL, Campbell MJ, Griffin SJ, Spiegel N: Diabetes care from diagnosis: effects of training in patient-centred care on beliefs, attitudes and behaviour of primary care professionals. *Patient Educ Counsel* 37:65–79, 1999
14. Mead N, Bower P, Hann M: The impact of general practitioners on patient centredness on patients' post consultation satisfaction and enablement. *Soc Sci Med* 55:283–299, 2002
15. Howie J, Heaney D, Maxwell M, Walker J: A comparison of a Patient Enablement Instrument (PEI) against two established satisfaction scales as an outcome measure of primary care consultations. *Fam Pract* 15:165–171, 1998
16. Bandura A: *Self-Efficacy: The Exercise of Control*. New York, WH Freeman Company, 1997
17. Aubert RE, Herman WH, Waters J, Moore W, Sutton D, Peterson BL, Bailey CM, Koplan JP: Nurses' case management to improve glycaemic control in diabetic patients in a health maintenance organisation. *Ann Intern Med* 129:605–612, 1998
18. Blas EA, Jaffrey F: Telephone and computer communication improves clinical health care process and patient outcomes. *J Am Med Assoc* 278:152–159, 1997
19. Piette JD, Weinberger M, McPhee SJ, Mah C, Kraemer FB, Crapo M: Do automated calls with nurse follow up improve self care and glycaemic control among vulnerable patients with diabetes. *Am J Med* 108:20–27, 2000
20. Young RJ, Taylor J, Friede T, Hollis S, Mason JM, Lee P, Burns E, Long AF, Gambling T, New JP, Gibson JM: Pro-Active

- Call Center Treatment Support (PAC-CTS) to improve glucose control in type 2 diabetes: a randomized controlled trial. *Diabetes Care* 28:278–282, 2005
21. Bradley C, Ed.: *Handbook of Psychology and Diabetes: A Guide to Psychological Measurement in Diabetes Research and Practice*. Chur, Harwood, 1994
 22. Strauss A: *Qualitative Analysis for Social Scientists*. Cambridge, Cambridge University Press, 1987
 23. Campbell M, Fitzpatrick R, Haines A, Kinmouth AL, Sandercock P, Spiegelhalter D, Tyrer P: Framework for design and evaluation of complex interventions to improve health. *BMJ* 321:123–126, 2000
 24. Carr-Hill RA: The measurement of patient satisfaction. *J Public Health Med* 14: 236–249, 1992
 25. Pibernik-Okanovic M, Prasek M, Poljicanin-Filipovic, Pavlic-Renar I, Metelko Z: Effects of an empowerment-based psychosocial intervention on quality of life and metabolic control in type 2 diabetic patients. *Patient Educ Counsel* 52:193–199, 2004
 26. Bourbeau J, Nault D, Dang-Tan T: Self-management and behaviour modification in COPD. *Patient Educ Counsel* 52:271–277, 2004
 27. Knowles E, O’Cathain A, Morrell J, Munro JF, Nicholl JP: NHS Direct and nurses: opportunity or monotony? *Int J Nurs Studies* 39:857–866, 2002
 28. Izquierdo R, Kearns J, Knudson PE, Ploutz-Synder R, Meyer S, Weinstock RS: A comparison of diabetes education administered through telemedicine versus in person. *Diabetes Care* 26:1002–1007, 2003