Effects of routine education on people newly diagnosed with type 2 diabetes

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Abstract

Background: In Ireland, there is limited knowledge about the perceptions or behaviours of people newly diagnosed with diabetes and, due to the lack of a national register, poor knowledge of their demographic profile.

Aim: To add to the body of knowledge about diabetes, to obtain perceptions of people newly diagnosed with type 2 diabetes who attend group diabetes education, and to examine their relationships with the adoption of diabetes self-management behaviours.

Method: A correlational study was conducted among people attending routine group diabetes education at three diabetes clinics during 2006/7, from which a convenience sample of 168 (38%) participants were recruited.

Results: Men newly diagnosed with diabetes were younger, waited less time to attend group diabetes education, had a more positive diabetes attitude and perceived themselves to have more social support than women. Women had better diabetes self-management dietary and medication adherence behaviours prior to attending group diabetes education than the men.

Conclusion: People newly diagnosed with diabetes differ in their attitude, perceived support and self-efficacy to adopt dietary and exercise behaviours and have different behaviour change needs at diagnosis. Post-attendance at diabetes education, they adopt behaviours at variable rates and may not sustain the change. The study findings indicate that healthcare professionals should monitor continually the need for behavioural change, in particular physical exercise behaviours in women and dietary and medication adherence in men. They should also continuously assess the maintenance of diabetes self-management behaviours of all people with diabetes, while promoting confidence in achieving desired outcomes.

Key words

Type 2 diabetes; self-management; behaviours; newly diagnosed; attitude; self-efficacy; social support

Introduction

It is important that people diagnosed with diabetes actively self-manage their illness to reduce the development of diabetes complications.[1] In order to adopt healthy behaviours, people must want to change and have the capacity to do so which is associated with individual perceptions. A patient's perception of diabetes is personal, whereas a healthcare provider's perception is explicit,[2] with each having different concerns.[3] At diagnosis, people with type 2 diabetes can vary greatly in their perceptions of the illness, from that of a catastrophic event[4] to unlikely to affect their lifestyle[5] or as a catalyst for adopting healthier behaviours.[6] There is evidence that people do not view type 2 diabetes as a serious illness[7] nor relate current diabetes control to future health.[8,9] The literature on living with diabetes identifies that attitude to diabetes, perceived nutrition self-efficacy, perceived exercise self-efficacy and perceived social support are important variables in the adoption of diabetes self-management behaviours in people with type 2 diabetes.[10]

Adoption of diabetes dietary self-management behaviours is the most effective method of maintaining acceptable blood glucose control, with poor dietary behaviours resulting in poor glycaemic control.[11] There are many studies examining the relationship between dietary behaviours and the development of type 2 diabetes, but few studies have examined the relationship between individual perceptions and diabetes self-management dietary behaviours. Habitual physical exercise behaviours are widely recognised as reducing the incidence and mortality of cardiovascular disease,[12] yet many people with diabetes fail to adopt such behaviours.[13]

Understanding diabetes and its treatment are considered to be the key factors influencing self-management, emotional well-being and glycaemic control.[14] Some studies have examined the relationship between perceptions and diabetes self-management behaviours by measuring outcome behaviours,[15] but no study has specifically examined diabetes attitude, perceived nutrition self-efficacy, perceived exercise self-efficacy and perceived social support and the adoption of diabetes self-management behaviours in people newly diagnosed with diabetes.

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Patients and methods

The accessible population in our study was all people newly diagnosed with type 2 diabetes attending routine group diabetes education at three urban diabetes clinics. From this population, a convenience sample was recruited. The focus of the study was perceptions about diabetes and behaviours, not evaluation of diabetes education. Three time-points were used in the present study with an unknown growth trajectory and possible 20% attrition rate.[16] A sample size of 150 (Power and Precision 3) offered adequate power using the effect size of 0.80 and the alpha level of significance $p \leq 0.05$ (two tailed).

Following receipt of ethical approval, a correlational, longitudinal study was conducted using informed consent procedures to add to the body of knowledge about diabetes perceptions of people newly diagnosed with type 2 diabetes and to examine the relationship of those perceptions with the adoption of diabetes self-management behaviours (dietary, physical exercise and medication adherence). Routine care for all people diagnosed with type 2 diabetes in Ireland referred to secondary care is mandatory attendance at educational sessions prior to referral for medical review. The participants were sent the survey immediately prior to attendance for group diabetes education, at one month and six months post-attendance (Table 1). The educational sessions are a presentation of basic diabetes knowledge and skills by a diabetes nurse. They last for two hours, with a follow-up session two weeks later on advanced knowledge and skills. At the time of this study, diabetes education programmes in Ireland were not adhering to structured education guidelines.[17]

Data were collected using reliable and valid instruments that had previously been used on similar populations (Table 2). Data were entered into SPSS (SPSS Inc., Chicago, USA) and double checked for accuracy and errors. Standard descriptive statistics were used to characterise the study population and comparisons were made by parametric (*eg* t-test) and non-parametric (*eg* χ^2 test) tests when appropriate. Relationships were identified by examination of the Pearson product-moment correlation coefficient and hierarchal regression analysis was used to determine the predictors of behaviour adoption.

Time	Action	Follow-up
Time 1	Letter of invite, consent form, Booklet 1 and instructions on how to complete and return the booklet were sent out with the appointment for diabetes education session by the hospital secretary	None
Time 2	One month after attendance at diabetes education session 1 (*ie* one month after Time 1), Booklet 2, a stamped-addressed envelope, a copy of the signed consent form and cover letter were posted to the participant by the researcher	If Booklet 2 was not returned within two weeks, a reminder letter, reply envelope and another Booklet 2 were sent to the participant
Time 3	Six months after attendance at diabetes education session 1 (*ie* six months after Time 1), Booklet 3 and a stamped-addressed envelope were posted to the participant by the researcher	If Booklet 3 was not returned within two weeks, a reminder letter, a reply envelope and another Booklet 3 were posted to the participant. Two weeks later, a reminder letter was sent

Table 1. Data collection protocol for the study on effects of routine education on people newly diagnosed with type 2 diabetes

Results

Out of a population of 436 people, 168 agreed to participate in this study (response rate 38%). Independent sample t-tests indicated responders perceived themselves to have less social support, measured using the Medical Outcomes Social Support Survey Scale (MOSSSS)[18] than non-responders at Time 2. Characteristics of the participants are shown in Table 3. Gender was the only characteristic that participants differed significantly in pre-attendance for group diabetes education (Table 4).

Pearson product-moment correlation coefficient determined that neither diabetes attitude measured by the Diabetes Attitude Scale–3 (DAS–3),[19] nor perceived social support (MOSSSS), was related to adoption of diabetes self-management behaviours, *ie* dietary fat intake measured by Dobson's 17-item Short Fat Questionnaire,[20] physical activity levels measured by an Irish version of Godin's Leisure-time Exercise Questionnaire[21] and medication adherence if taking medication measured by the Medication Report Scale–5.[22] Perceived nutrition self-efficacy, measured using the Perceived Nutrition Self-efficacy Scale,[23] was

predicted to be 11% at Time 2 and 15% at Time 3 of the variance in diabetes self-management dietary behaviours; perceived exercise self-efficacy, measured using the Perceived Exercise Self-efficacy Scale,[23] was predicted to be 11% of the variance at Time 2 and 14% at Time 3 in diabetes self-management physical exercise behaviour when controlling for the contribution of diabetes attitude and perceived social support. A series of one-way repeated measures ANOVA was carried out to examine change

Definition	Conceptual definition	Operational definition	Instrument used to measure variable	Cronbach's Alpha in this study
Diabetes Self-management Dietary Behaviour	A process of self-care by taking fewer calories from saturated fat, fewer high-fat eating behaviours and a caloric intake relative to caloric output through an individualised approach[24]	Self-reported dietary fat intake of less than 20% total fat, less than 7% saturated fat	Modified version of Dobson's 17-item Short Fat Questionnaire[20]	0.82
Diabetes Self-management Physical Exercise Behaviour	A process of self-care through taking physical exercise tailored to individual capacity and coexistent conditions[24]	Self-reported regular physical exercise	Godin's Leisure-time Exercise Questionnaire[21]	Not computed as result is an actual measure
Diabetes Self-management Medication Adherence Behaviour	A process of self-care by taking medications as prescribed with adherence defined as the degree to which patient behaviour is congruent with the recommendations of healthcare providers[25]	Self-reported habitual adherence to taking of prescribed medications	Medication Adherence Report Scale–5[22]	0.97
Diabetes Attitude	A person's response based on their positive or negative evaluation of the object and their beliefs regarding the object[26]	A person's positive or negative evaluation of diabetes	Diabetes Attitude Scale –3[19]	0.66
Perceived Nutrition Self-efficacy	Belief in one's capabilities of organising and executing the courses of action required to produce given attainments[27]	Belief in one's ability to carry out diabetes self-management dietary behaviours	Nutrition Self-efficacy Scale[23]	0.90
Perceived Exercise Self-efficacy	Belief in one's capabilities of organising and executing the courses of action required to produce given attainments[27]	Belief in one's ability to carry out diabetes self-management physical exercise behaviours	Exercise Self-efficacy Scale[23]	0.93
Perceived Social Support	A person's estimate of the level of support, love and care they consider to be available to them if they need it[28]	A person's evaluation of the emotional and physical assistance that is available to them should they need it	Medical Outcomes Study Social Support Survey[18]	0.95

Table 2. The variable definitions and instruments used to collect data

from Time 1 (pre-attendance at diabetes education), Time 2 (one month) and Time 3 (six months) post-attendance, as shown in Table 5. Diabetes attitude immediately post-attendance increased, but subsequently reduced somewhat, except for attitude to the seriousness of diabetes which continued to increase at Time 3, as did perceived nutrition self-efficacy. There were no significant changes in perceived exercise self-efficacy or perceived social support over the six months. The only significant change in diabetes self-management behaviours was in dietary behaviour, which was markedly reduced at Time 2 and almost sustained to Time 3 (see Table 5).

Characteristic	n=168
Age in years M, (SD), (Minimum–Maximum)	57.25 (11.65) (28–79)
Months since diagnosis M, (SD), (Minimum–Maximum)	2.52 (2.26) (0–11)
Gender (%) (n)	
Male	57.7 (97)
Female	42.3 (71)
Age in years at completion of schooling M, (SD), (Minimum–Maximum)	17.1 (3.9) (11–58)
Educational attainment % (n)	
Attended primary school only	31.0 (52)
Attended some secondary school only	25.6 (43)
Completed secondary school	19.0 (32)
Attended some 3rd level college only	7.1 (12)
Completed 3rd level education	14.9 (25)
Missing	2.4 (4)
Have another illness % (n)	
Cardiac-related condition (including hypertension, dyslipidaemia)	32.1 (58)
Cancer	0.9 (2)
Arthritis	2.7 (6)
Other	14.7 (22)
No other illness reported	42.6 (69)
Did not respond	7.0 (11)

Table 3. Demographic profile of participants

Discussion

The study findings indicate that, similar to other countries, more men than women are diagnosed with type 2 diabetes and are diagnosed at a younger age.[29] Gender differences were present prior to attendance at diabetes education in length of time since diagnosis and perceived social support. Women waited longer than men to attend group diabetes education, which may be indicative of them generally putting other peoples' health before their own[30] and should be borne in mind when negotiating a diabetes plan with them. Gender influenced diabetes attitude pre-attendance at diabetes education, with women having a more negative diabetes attitude compared to men; this was in keeping with previously reported results in smaller qualitative studies.[6,30,31] Attendance at group diabetes education did alter diabetes attitude positively in the short term, but that change was not sustained, as other researchers have previously documented in diabetes education evaluations of professional courses.[32,33] Professionals should tailor information accordingly, i.e. using facilitating skills so that key messages are delivered at a time appropriate to the individual and reinforced at every opportunity. There is much emphasis in the general media about the seriousness of type 2 diabetes, but the study findings indicate that the messages currently delivered are not effective, which warrants further investigation. Higher perceived nutrition self-efficacy was associated with adoption of diabetes self-management dietary behaviours, as reported previously,[23,34] indicating the need for professionals to assess self-efficacy at each encounter and tailor interventions to promote self-efficacy, e.g. using motivational interviewing techniques to assist in setting targets. The relationship between perceived exercise self-efficacy and diabetes self-management physical exercise behaviour was supported with the strength of the relationship less than previously reported;[34,35] however, this may be due to the different instruments used. In evaluation of educational interventions, it is important that comparable reliable instruments are available.

Women perceived themselves to have less social support than men which is generally accepted.[36] Therefore, further research is warranted of single gender group support which women attend more comfortably than men. Women had better diabetes self-management dietary and medication adherence behaviours than men prior to attending group diabetes

Variable	Males		Females			
	M	SD	M	SD	df	t
Age in years	55.35	12.46	59.85	11.65	166	2.56*
Length of time in months since diagnosis of diabetes	2.20	2.03	2.97	2.48	165	2.19*
Diabetes attitude	3.84	0.27	3.79	0.12	101	0.97
DAS–3 subscale: Need for specialised training*	4.16	0.41	4.13	0.39	129	0.69
DAS–3 subscale: Seriousness of diabetes*	3.9	0.64	3.80	0.40	131	1.05
DAS–3 subscale: Value of tight control*	3.79	0.46	3.48	0.55	113	0.06
DAS–3 subscale: Psychological impact*	3.63	0.60	3.48	0.55	151	1.67
DAS–3 subscale: Patient autonomy*	3.61	0.43	3.59	0.40	146	0.64
Nutrition self-efficacy	15.51	3.22	15.37	3.12	158	0.28
Exercise self-efficacy	13.60	3.69	13.02	4.02	156	0.94
Perceived social support	8.76	1.33	8.14	1.81	114	2.29*
MOSSSS subscale emotional/ informational support*	4.03	0.85	3.38	0.87	153	1.44
MOSSSS subscale tangible support*	4.47	0.63	3.92	1.01	154	3.97*
MOSSSS subscale affection support*	4.49	0.74	4.19	1.09	155	2.04**
MOSSSS subscale positive interaction support*	4.36	0.82	4.17	1.06	154	1.80
Diabetes self-management dietary behaviour	23.0	8.14	20.34	8.69	151	1.92
Diabetes self-management physical exercise behaviour	25.06	25.79	18.61	23.29	116	1.39
Diabetes self-management medication adherence behaviour	23.26	2.43	23.44	3.26	128	0.372

*$p<0.05$; **$p<0.01$

Table 4. Mean difference between men and women pre-attendance at Group Diabetes Education

education as indicated previously;[37] therefore, research is recommended into single gender group education, with female groups focusing more on exercise-enhancing behaviours. Approximately half of the participants reported not adhering to recommended dietary fat intake (<20% total fat, <7% saturated fat) similar to the general Irish population.[38] Other studies have shown that only one-quarter to one-third of people with diabetes follow recommended dietary guidelines,[39] with more motivational interventions required. Similarly, only 40% of participants took the recommended minimal level of physical activity, which is similar to other studies.[13,39–41] The majority of participants in this study reported taking their medications as prescribed, which is similar to that reported by Byrne[42] in a similar population, but much higher than reported by Hayes *et al.*[43] The emphasis in the medical management of diabetes is on medication management to optimise blood glucose control, but professionals should check patient compliance before altering medications. More emphasis is necessary to motivate and sustain people with diabetes to adopt appropriate behaviour, as endorsed by structured education programmes, such as DESMOND,[44] X-PERT[45] and the CODE[46] programme developed in Ireland after this study.

In light of previous research, the chosen methodology offered more advantages than other methods and, therefore, negated the possible limitations of using quantitative research.

The study findings indicate that healthcare professionals need to assess the perceptions of people newly diagnosed with diabetes and tailor the education programme to those perceptions, i.e. adhere to the principles of structured education programmes. In particular, they need to focus on strategies to improve their self-efficacy in adopting the necessary behavioural change and ongoing motivational interventions to sustain adoption.

More research is recommended to identify motivational interventions that promote the adoption and maintenance of diabetes self-management behaviours. Since this study, there has been a move in Ireland towards structured education programmes for people with diabetes, whereby the programme is delivered based on a needs assessment of those attending and evaluated post attendances with the evaluation results used to inform clinical practice.

Variable	Time 1		Time 2		Time 3		ANOVA		
	M	SD	M	SD	M	SD	df	F	Ë2
Diabetes attitude	3.82	0.25	3.93	0.32	3.89	0.36	2,206	12.05	0.004*
DAS–3 subscale: Need for specialised training	4.15	0.40	4.23	0.40	4.16	0.49	2.236	4.91	0.008**
DAS–3 subscale: Seriousness of diabetes	3.96	0.58	4.24	0.62	4.30	0.56	2.228	33.6	0.000**
DAS–3 subscale: Value of tight control	3.80	0.43	3.90	0.48	3.92	0.46	2,226	4.13	0.017*
DAS–3 subscale: Psychological impact	3.57	0.60	3.57	0.60	3.52	0.68	2,219	2.93	0.103
DAS–3 subscale: Patient autonomy	3.62	0.41	3.69	0.48	3.58	0.45	2,228	2.06	0.134
Nutrition self-efficacy	15.46	3.16	15.55	3.39	16.12	2.98	2,222	1.36	0.05*
Exercise self-efficacy	13.34	3.82	13.15	3.83	13.63	3.72	2,212	1.17	0.32
Perceived social support	8.49	1.57	8.39	1.67	8.49	1.77	2.198	0.66	0.59
MOSSSS subscale emotional/ informational support	3.95	0.85	3.98	0.91	4.03	0.94	2,226	0.016	0.98
MOSSSS subscale tangible support	4.24	0.85	4.08	1.05	4.20	1.07	2,226	0.728	0.49
MOSSSS subscale affection support	4.36	0.91	4.27	1.03	4.36	0.94	2,218	0.842	0.43
MOSSSS subscale positive interaction support	4.24	0.94	4.23	0.92	4.30	0.89	2,224	1.33	0.26
Diabetes self-management dietary behaviour	21.93	8.45	17.63	6.92	17.94	7.09	2,194	36.59	0.000**
Diabetes self-management physical exercise behaviour	22.33	24.98	26.41	22.57	30.64	24.89	2,122	1.31	0.27
Diabetes self-management medication adherence behaviour	23.33	2.79	23.31	2.71	23.30	2.26	2,184	0.72	0.48

Ë2,effect size: *p<0.05; **p<0.01

Table 5. Means and standard deviations for one-way repeated measures analysis of variances for effects of time on the independent and dependant variables

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Conflict of interest statement:

None

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