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An evaluation of the effectiveness of a brief self-management educational expo provided by a consumer health organisation for people with type 2 diabetes

Efficacité d'une intervention éducative d'une journée sur la gestion du diabète réalisée sous l'égide d'une association de patients

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Abstract – Introduction: Consumer health organisations have a growing role in providing diabetes education, particularly as a means of community education, but the effectiveness of this method of providing diabetes education is not known. **Objective:** This study aimed to evaluate the effectiveness of a one-day large group diabetes self-management educational expo that was provided by a leading consumer health organisation and delivered by a multi-professional team. **Methods:** A pre-test post-test study in which participants ($n = 213$) were individuals with type 2 diabetes who attended a community diabetes education expo. Participants completed a questionnaire that assessed their diabetes knowledge, self-management, self-efficacy, and empowerment prior to the expo, immediately after its conclusion, and approximately one month later. **Results:** Between pre-expo and post-expo there was significant improvement in self-management scores (increase of 1.55, 95% confidence interval [CI] 0.17 to 2.93, $p = 0.03$) and empowerment scores (increase of 0.10, 95% CI 0.01 to 0.20, $p = 0.03$). Between post-expo and follow-up there was a significant improvement in empowerment scores (increase of 0.25, 95% CI 0.11 to 0.40, $p = 0.001$). There was no improvement in knowledge or self-efficacy. **Conclusions:** The expo resulted in small improvements in participants' reported levels of self-management and empowerment; however recommendations to refine the format of the expos and methods used to provide the education are provided.

Key words: type 2 diabetes / self-management education / consumer health organisation / community education

Résumé – Introduction: Les associations de patients jouent un rôle croissant dans l'éducation thérapeutique du diabète, particulièrement en tant que vecteur d'une éducation communautaire. Cependant, l'efficacité de cette stratégie d'éducation sur le diabète n'est pas connue. **Objectif:** Cette étude a pour but d'évaluer l'efficacité d'un cours d'une journée sur l'autogestion du diabète. Cette intervention en grand groupe a été menée par une équipe multi professionnelle sous l'égide d'une importante association d'usagers de services de santé. **Méthode:** Un groupe de 213 patients diabétiques de type 2 ayant assisté au cours a complété un questionnaire avant, immédiatement et un mois après l'intervention. Le questionnaire évaluait les connaissances acquises sur le diabète, leur autogestion de la maladie, leur sentiment d'auto-efficacité et leur empowerment. **Résultats:** La comparaison des résultats pré et post intervention montre une amélioration significative de l'autogestion (augmentation de 1,55, intervalle de confiance de 95 % [IC 95 %] : 0,17–2,93, $p = 0.03$) et de l'empowerment (augmentation de 0,10, IC 95 % : 0,01–0,20, $p = 0.03$). On note encore une amélioration des résultats d'empowerment immédiatement après l'intervention et jusqu'au suivi un mois après (augmentation de 0,25, IC 95 % : 0,11–0,40, $p = 0,001$), mais aucune amélioration des connaissances ni du sentiment d'auto-efficacité n'a été observée. **Conclusion:** L'intervention pédagogique a permis l'amélioration des niveaux d'autogestion et d'empowerment, laquelle persiste jusqu'à un mois après l'intervention. Les auteurs formulent des recommandations pour améliorer le format et les techniques éducatives de ces cours.

Mots clés : Diabète de type 2 / éducation thérapeutique / association de patients / éducation communautaire

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1 Introduction

Type 2 diabetes is a chronic health condition that has been rapidly increasing in prevalence in westernised societies and its growth is projected to continue [1]. As a result of the chronic nature of this condition, self-management education is considered to be a cornerstone of type 2 diabetes care [2]. The main aims of self-management education are to encourage individuals' active involvement in the management of their health condition, increase their knowledge of self-care strategies, and influence their future self-management behaviour [3]. However individuals with diabetes need more than just an adequate level of knowledge and in order to facilitate self-management behaviours, educational interventions also need to promote empowerment and self-efficacy [4, 5].

A Cochrane review of group-based self-management education for people with type 2 diabetes concluded that this method of providing education can be effective at improving diabetes control and knowledge of diabetes [4]. Most of the studies that were included in this review evaluated interventions that were provided over an extended period of time, between 4 weeks and 10 months. A criticism of diabetes self-management education that is provided for extended periods is that the health professionals who provide the education have a long term involvement in individuals' self-management. As a result of the sustained involvement of educators, there is the risk that individuals become passive recipients of diabetes care rather than managing their own illness [5]. A recent meta-analysis of self-management interventions for people with type 2 diabetes identified a trend that shorter interventions that consisted of compacted sessions may have benefits over interventions of longer duration [7]. A systematic review of models of diabetes self-management education also suggested that better outcomes may be obtained when the education is presented by a multidisciplinary team [7].

Consumer health organisations, particularly for chronic conditions, have a growing role in providing self-management education. These organisations promote healthy behaviours and aim to provide individuals with support, information, a sense of belonging, coping strategies, and experiential knowledge [8]. Individuals with diabetes report turning to such organisations to fill their knowledge gaps [8, 9] and health professionals frequently refer individuals to diabetes consumer health organisations to obtain information and support [7]. However, no research into the effectiveness of the educational events that are offered by diabetes consumer health organisations could be located in the literature. This study aimed to evaluate whether this educational format improved the knowledge, self-efficacy, perceived self-management ability, and empowerment of people with type 2 diabetes.

2 Methods

2.1 Study design and participants

The state branch of Australia's leading diabetes consumer health organisation regularly conducts a one-day large group community-based education event where presentations are delivered by a multidisciplinary team of health professionals. Individuals who had type 2 diabetes and registered their attendance at either of two Diabetes Australia Queensland (DAQ, www.diabetesqld.org.au) one-day community educational expos were invited to participate in this project. The expos were held in Brisbane, Australia in November 2009 and March 2010. Ethical clearance to conduct the study was provided one of the ethics committees of the University of Queensland. The study used a pre-test post-test design.

2.2 Procedure

After providing informed consent, participants were asked to complete the pre-expo questionnaire. Participants then attended the educational sessions, which were large-group primarily didactic, lectures for the duration of the day (approximately 6 hours of educational content). The health professionals who presented the sessions included a medical practitioner, dietician, nurse who was also a diabetes educator, exercise physiologist, podiatrist, optometrist, and psychologist. The main topics presented in the sessions included: blood glucose monitoring, healthy eating, changing behaviour and goal setting, exercise, eye care, and foot care. At the end of the day, participants were asked to complete the post-expo questionnaire. Participants who provided their telephone number on the consent form were telephoned by a researcher approximately one month following the expo and the same questionnaire was readministered.

2.3 Measures

The questionnaire consisted of five sections. The first section contained demographic and clinical questions, such as age, highest education level completed, and number of years since diagnosis. The second section assessed knowledge of diabetes and multiple-choice questions were adapted from an existing diabetes knowledge questionnaire [10] to reflect the content of the day's presentations. The total maximum score possible for this knowledge measure is 12. This section of the questionnaire is available from the authors by request.

The third section consisted of a diabetes self-efficacy measure which assessed participants' self-efficacy in managing aspects of diabetes care such as medical professional liaison and

Table I. Participants' pre-expo and change scores (pre-expo to post-expo and post-expo to follow-up) for knowledge, self-efficacy, self-management, and empowerment. – *Évolution des scores des participants à une journée (expo) d'éducation (pré-expo à post-expo et post-expo de suivi) pour la connaissance, l'auto-efficacité, l'auto-gestion, et l'autonomisation.*

Outcome	Mean (SD) pre-expo scores (n = 213)	Pre-expo to post-expo (n = 213)			Post-expo to follow-up (n = 104)		
		Change score	95% CI	p value	Change score	95% CI	p value
Knowledge	8.12 (1.88)	0.18	-0.13 to 0.50	0.25	0.44	-0.04 to 0.92	0.07
Self-efficacy	79.79 (26.36)	-0.43	-1.33 to 2.20	0.63	1.81	-0.66 to 4.29	0.15
Self-management	70.22 (32.33)	1.55	0.17 to 2.93	0.03	2.05	-0.79 to 4.88	0.16
Empowerment	4.00 (0.98)	0.10	0.01 to 0.19	0.03	0.25	0.11 to 0.40	0.001

information gathering, diet, exercise, medication and blood glucose monitoring [11]. Responses were scored on a 4 point Likert scale from 1 (not at all sure) to 4 (very sure). Scores were summed and converted to a 100 point scale, with higher scores indicating higher self efficacy. Good internal consistency of this scale has been reported (Cronbach's $\alpha = 0.78$) [11].

The fourth section consisted of an existing 5-item measure of self-management activities in which participants rated their perceived difficulty and performance of diabetes self-management in the areas of medication, exercise, eating plans, blood glucose monitoring and foot care [12]. Each item was scored using a 5 point Likert scale from 1 (so difficult I could not do it at all) to 5 (not difficult at all, I did it exactly right). There was also a 'not applicable' response choice. The possible score range for this scale is 0 to 100, with higher scores indicating better treatment adherence. The internal consistency of this measure has been established and the measure was validated as part of the American Diabetes Quality Improvement Project [12].

The final section contained the 8-item Diabetes Empowerment Scale – Short Form in which participants rated their beliefs about their perceived self-management ability, stress and perceived readiness to change aspects of their self management [13]. Items began with "In general I believe that I ..." and a 5 point Likert scale from "strongly disagree" (1) to "strongly agree" (5) was used. Example endings of items were "... know what part(s) of taking care of my diabetes that I am dissatisfied with" and "... know what helps me stay motivated to care for my diabetes". Scores were summed and divided by the total number of items, with higher scores indicating higher levels of empowerment. Good internal consistency of this measure has been reported with a Cronbach's alpha of 0.84 [13].

2.4 Statistical analyses

Data analysis was performed using STATA, version 11 (StataCorp., College Station, TX, USA). Analysis was only performed on matched questionnaires. For each of the four outcome measures (knowledge, self-efficacy, self-management,

and empowerment) paired t-tests were used to analyse the difference between pre-expo and post-expo scores, and the difference between post-expo and follow-up scores. The significance level was set at $p < 0.05$.

3 Results

At the two expos, there was a total of 264 attendees that had diabetes and of these, pre-expo and post-expo questionnaires were completed by 213 participants with type 2 diabetes, providing a response rate of 80.7%. Of these participants, 104 provided consent for and were able to be contacted to complete the follow-up telephone interview.

Of the 213 participants, 122 (57.28%) were female. Eight (3.76%) participants were less than 45 years of age, 90 (42.25%) were aged between 45 and 65 years, 78 (36.62%) were between 65 and 75 years, and 37 (17.37%) were older than 75 years. Participants' mean number of years of formal education was 11.67 (SD 3.35, range 5–30) and the mean number of years since the diagnosis of diabetes was 9.56 (SD 7.24, range 1–35).

Table 1 shows the pre-expo scores and the change scores, from pre-expo to post-expo and from post-expo to follow-up, for the outcomes of knowledge, self-efficacy, self-management, and empowerment. Between pre-expo and post-expo, there were statistically significant changes in self-management scores (an improvement of 1.55, 95% confidence interval [CI] 0.17 to 2.93, $p = 0.03$) and empowerment scores (an improvement of 0.10, 95% CI 0.01 to 0.20, $p = 0.03$). Between post-expo and follow-up, only the change in the empowerment scores was statistically significant (an improvement of 0.25, 95% CI 0.11 to 0.40, $p = 0.001$).

4 Discussion

The aim of this study was to examine whether a one-day large group multi-disciplinary educational expo provided by a consumer health organisation was able to improve the knowledge, self-efficacy, self-management, and empowerment of people

with type 2 diabetes. From pre-expo to post-expo, there were improvements in participants' reported ability to perform self-management tasks and their level of empowerment. From the conclusion of the expo to approximately one month later, there was a continued increase in empowerment. While it is encouraging that there was an improvement in empowerment both at the immediate conclusion of the expo and one month after it was held, this outcome was a measurement of participants' perceived self-ability to perform self-management tasks and their readiness-to-change, which may not necessarily translate into actual behaviour change.

In some theories of behaviour change, such as the Health Belief Model, it has been theorised that an adequate level of knowledge of necessary health behaviours and consequences as well as self-efficacy are precursors to behaviour change [14]. Knowledge about diabetes is an outcome that is typically measured in studies of self-management education. Previous group-based patient education interventions have shown an increase in knowledge as a result of the education [4]. However in the current study, there was no significant improvement in participants' knowledge about diabetes. Participants' mean knowledge score was reasonably high (8.12 out of 12) at the beginning of the expo and the content of the educational sessions was not tailored according to participants' informational needs. As such, the educational sessions may not have addressed the gaps in participants' knowledge and may have provided information that they were already knowledgeable about. The one day large group format primarily provided information in one style and did not cater to the various learning styles of participants, which may have hindered the uptake of information [14]. Additionally, the outcome measure that was used to measure knowledge may have lacked sensitivity and not detected any increases in knowledge that occurred.

The current study also found no improvement in participants' self-efficacy. Two recent randomised trials that have evaluated group self-management interventions for people with diabetes have reported significant improvements in participants' self-efficacy [15, 16]. Of note is that both of these studies provided education within small groups and incorporated the use of role models who were successfully self-managing their diabetes [15, 16]. The use of peer role models is a suggested strategy for increasing self-efficacy [17]. This is not a strategy that is currently used in the DAQ educational expos, but should be considered for incorporation into future expos and the value of doing so evaluated.

Another strategy that been suggested for increasing self-efficacy is breaking the desired action into smaller achievable components and using goal-setting to achieve them [17]. A pre-test post-test evaluation of a diabetes self-management program and goal-setting intervention found that goal setting was an effective method of helping participants to achieve positive behaviour change [18]. This study also showed that participants

who had success in goal setting also initiated further behavioural goals outside of those suggested in the program [18]. Even though the expo contained a session on goal-setting, this was delivered in a didactic manner, which did not provide attendees with the opportunity to undertake a goal-setting exercise, or receive support and feedback while doing so.

A recent meta-analysis of the effectiveness of diabetes self-management interventions identified a trend in which shorter interventions, where information was delivered in a succinct number of sessions, appeared to be more effective and suggested that further research into the optimal duration of interventions was needed. In the current study, the education was provided in a condensed one-day format, of approximately 6 h duration, however there were limited significant findings. A randomised controlled trial of structured self-management group education programme for people with newly diagnosed with type 2 diabetes (DESMOND programme) concluded that this intervention was effective at promoting weight loss, smoking cessation and positive improvements in participants' beliefs about diabetes at 12 months [5]. In the current study, the mean length of time since diagnosis was 9 years and so may not have been as motivated as people who were newly diagnosed to make changes in their behaviour. In a qualitative study of participants who participated in the DESMOND programme it was found that people who were newly diagnosed and had accepted their "diabetic identity" were more aware of the lifestyle recommendations for people with diabetes than a control group receiving usual care [19]. There are two additional features that were utilised in the DESMOND programme but not in the expos. Namely, a small-group interactive format (group size ranged from 3–11 people) which may have enabled tailoring of the information to individual's needs and learning styles and the incorporation of goal setting into the intervention. Both of these features have been previously discussed as potentially contributing to the limited effectiveness of the expos.

The limited effectiveness of the expos may also be a result of the format, mainly didactic, that was used in the educational sessions. An analysis of diabetes self-management education interactions found an association between lower amounts of time spent talking by a diabetes educator and a greater change in participants' belief about diabetes [20]. A review of diabetes educational interventions suggested that presenting information in a didactic manner is capable of producing changes in knowledge but ineffective in producing behaviour change [21]. This review also showed that interventions that offered more than just didactic presentation of information were more effective in producing improvements in both physical and psychosocial outcomes [21]. While the large-group format that was used in the expos is able to reach a large number of people and as such has the potential to be a cost-effective method of providing self-management education, the effect of incorporating alternative methods of information delivery into the expos should be evaluated in future research.

There are some limitations to this study. Participants were likely a minority of the population who were sufficiently motivated to attend an educational expo and as such, may not be representative of the general population of people with type 2 diabetes. As the measure of knowledge used in the study needed to reflect the content of the presentations, a previously validated knowledge measure was modified, however an evaluation of the psychometric properties of the modified measure was not conducted. Inclusion of a measure of participants' intention to change behaviour may have provided useful information which could be used to inform future studies in this area. There was a large proportion of patients who did not consent to or were not able to be contacted to complete the follow-up telephone questionnaire which may have introduced bias into the results of the study.

Reviews of self-management education for people with type 2 diabetes have concluded that the optimal method of providing self-management education remains unclear [4, 22]. The authors of a randomised controlled trial of an effective community 12-h self-management intervention run in small groups attributes the success of the intervention to designing it according to a theoretical model of empowerment and incorporating peer learning and other specific program components such as goal setting [23]. The authors reported uncertainty as to which component was responsible for the success of the intervention and suggest it is likely to be a combination of the components [23]. Consumer health organisations have a growing role in providing self-management education [8] and it is important that the educational programs that they provide are informed by relevant health behaviour models, contain components that have been found to be effective such as goal setting and peer learning, and that the effectiveness of such programs is evaluated.

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Conflict of interests: nil.

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