The Australian diabetes educators' skills and readiness for the tsunami of diabetes in the 21st century

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Acknowledgements
This research has been funded by the Diabetes Australia Research Trust (DART) research grant scheme.

KEY WORDS

Diabetes, teaching, learning, education

ABSTRACT

Objective
The objective of the study was to identify the knowledge, skills and practices of diabetes educators in relation to teaching and learning.

Design
Quantitative and qualitative analysis of an online survey.

Setting
Diabetes educators across Australia.

Subjects
A convenience sample self-selected from the Australian Diabetes Educators Association (ADEA) data base.

Main Outcome Measures

Attributes and barriers to effective teaching and learning.

Results
The survey response rate was 16.2% (n=212) of the 1306 ADEA members. 79% were aged >40years and 10% were >60years; 93% were female; and 34% worked in the role of diabetes educator full-time. ADEA respondents spent 50% of their day on client education; 20% on administration; and 30% equally distributed between research, quality improvement, staff education and other duties. Barriers to effective teaching and learning were a lack of time, resources and issues associated with bedside teaching. Text responses indicated the desire to provide individualised, culturally, age and gender specific education. The majority of respondents (range 99.1%-95.5%, p=0.000) reported that providing education that allowed informed choices; helping clients learn from their choices and decisions; collaboratively writing goals and objectives; developing specific and tailored education programmes; teaching in a way that matched the clients' experiences; using interpreters; and involving families or significant others, were important.

Conclusion
Respondents were aware of the teaching and learning needs of their clients. However strategies to address barriers to effective teaching and learning and the need to maintain advanced skills and knowledge in the context of continuously changing practice and client demographics need to be considered.

INTRODUCTION

There is an increasing demand world wide from governments, employers and the community for accountability and multi-skilling of health professionals to improve health outcomes (AHWAC 2004). The responsibilities of the diabetes educator has evolved over the last decade from that of educator to a more comprehensive role, frequently encompassing management and counselling (Powers et al 2006; Anderson et al 1991; Davis 1990). Diabetes education is recognised as significant in the care of people with diabetes mellitus (Dunning and Martin 1998; Dunning et al 1994) and it is clear that appropriate treatment of people with diabetes has the potential to reduce hospitalisations and delay or prevent the onset of complications of diabetes (Colagiuri et al 2002; Dunstan et al 2001; Paduano et al 1987).

In the United States of America, certification of diabetes educators has been available since 1986. The purpose of certification is to ensure diabetes educators are competent, knowledgeable and proficient at providing diabetes education. Elsewhere internationally there are limited assessments of the knowledge and skills of diabetes educators in relation to teaching and learning (Sturt et al 2005; Paduano et al 1987).

In Australia, the accredited national curriculum for diabetes educators includes a minimum of 40 hours theory on teaching and learning and opportunities to develop teaching skills in practice. However in most Australian states, employment as a diabetes educator does not depend on completion of an accredited diabetes education course (ADEA 2006). Despite the availability of two diabetes educator distance education courses (Curtin and Deakin Universities), accessibility to such courses is difficult for many rural and semi-rural health professionals as minimal support for credentialing is provided by health agencies (Chabanuk 2006; Dunning and Martin 1998). These issues, combined with the increasingly broad role of diabetes educators in Australia, lends weight to the need for information about the existing knowledge, skills and practices of diabetes educators in relation to teaching and helping individuals with diabetes learn about their disease (Colagiuri et al 2002; Paduano et al 1987). With these issues in mind the aims of this study were to collect information about diabetes educators knowledge, skills and practices in teaching and learning; analyse the relationship between diabetes educators knowledge, skills and practices in teaching and learning; document diabetes educators' definitions and self-explanations of teaching and teachers by using metaphor in the form of analogies; and identify the continuing education needs of diabetes educators in relation to teaching and learning and make recommendations for practice.

Research Design and Methods

Design

The research used quantitative and qualitative methods using an online survey to collect the data. The survey was developed specifically for the study and pilot tested by peer review with two academic, two professional and two teaching and learning staff at the University of South Australia.

Respondents

All respondents were members of the Australian Diabetes Educators Association (ADEA). Participation was voluntary and anonymous. Any national ADEA member wishing to contribute to the research was eligible to participate. Based on a literature review to estimate the expected Australian response rate to electronic surveys, a sample of 17% (221 members) from each State and Territory was anticipated (Hamilton 2003).

Recruitment / Anonymity/Consent

A letter describing the purpose of the study with a hyperlink to the questionnaire inviting diabetes educators to participate was emailed to all ADEA members directly from the executive office of ADEA in November 2006. The ADEA secretariat forwarded an email to all members with a link to the online questionnaire using the *University of South Australia's (UniSA) Tell-Us* software and technology (The University of South Australia 2006). Diabetes educators responded by clicking on the hyperlink to the online survey and then completing the online

questionnaire. Through this online method the identity and confidentiality of all respondents was protected. A specific individual consent process was not considered necessary as completion and return of the questionnaire implied consent from respondents.

Data Collection

The questionnaire consisted of three main sections. Section one gathered demographic data about the respondents with particular emphasis on formal and continuing education courses in teaching and learning. The second section of the questionnaire sought information about the diabetes educator's definitions and descriptions of teachers and teaching, including the use of an analogy through short answer text box options (this section is the subject of a separate paper). The final section required respondents to complete Likert scales (Elliott 2002) about the teaching, learning and diabetes education knowledge, strategies and practical skills they use.

Data Analysis

Data were analysed using the Statistical Package for Social Science™ (Version 14 2004) and Microsoft Excel 2003. Descriptive statistics are presented as means, percentages or proportions.

An independent-samples t test was conducted to compare the Likert responses to questions regarding teaching and learning strategies for diabetes education. Results were considered significant if the 2-tailed p value was ≤ 0.05. The correlations between teaching and learning skills and participant characteristics were examined using Chi square (X^2) tests. Where significant overall differences were found, adjusted standardised residuals were examined to determine which category differed from the overall average. Adjusted standardised residuals in SPSS can be interpreted as Z-scores. Bonferroni corrections were applied by dividing the p values by the number of statistical comparisons made.

Text responses were analysed using a qualitative iterative strategy based on the method proposed by Huberman and Miles (1994). Using an iterative approach, emerging patterns and themes were identified and broad themes describing the issues and barriers surrounding current diabetes education were identified (the emerging patterns and themes are the subject of a separate paper).

Ethics

Ethics approval was obtained from The University of South Australia Human Ethics Research Committee.

Findings

From 10 October to 31 December 2006, a total of 212 ADEA members responded to the online survey. An invitation to participate was offered twice to members and the initial six week survey time frame was extended by a further six weeks due to the slow response rate. At completion of both survey time frames the overall response was 16.2% (n=212) of the 1306 ADEA members.

Demographic characteristics

Seventy nine percent of the respondents (n=167) were over forty years and ten percent were older than sixty years of age. Ninety three percent (n=198) were female (table 1). There were a large proportion of rural respondents (42.5%). Each Australian state and territory was represented proportionately to the ADEA membership distribution (table 1). Most respondents were employed in the public hospital sector (46.7%) or community based diabetes centres (19.8%), followed by other areas such as clinical trials and government agencies. No respondents were working within the aged care nursing home sector.

Diabetes educators performed multiple functions within their roles based on their qualifications and professional classification. Eighty eight percent described themselves as diabetes educators, 61% were registered nurses and 6.1% were dietitians. Other roles specifically identified included: client education (16.5%), staff education (15.6%), midwives, discharge coordinator and nurse practitioner (table 1).

Australian diabetes educators appear to be highly qualified with all respondents holding some form of post registration or post graduate qualification ranging from a certificate to a PhD. Sixty nine percent held a graduate certificate or diploma level qualification, with the highest qualification being a

doctorate. Seventy three percent had been practising in diabetes care for more than four years with half of this group (35%) practising for more than 10 years.

Only 34% of respondents worked in the role of diabetes educator full-time with the majority (59%) working between one and four days per week.

Table 1: Demographic characteristics of Australian Diabetes Educators Association survey respondents

Characteristic		n (%) Total n=212
Age group		
20-29yrs		11(5.2)
30-39yrs		34(16.0)
40-49yrs		87(41.0)
50-59yrs		70(33.0)
60+ years		10(4.7)
Sex		
Male		13(6.1)
Female		198(93.4)
Geographic Location		
Metropolitan		119(56.1)
Rural		90(42.5)
State of Australia (National Membership n=1306)	Survey Response	Membership
Victoria	60(28.3)	438(33.5)
New South Wales	41(19.3)	288(22.1)
Queensland	39(18.4)	190(14.5)
Western Australia	34(16.0)	171(13.9)
South Australia	26(12.3)	132(10.1)
Tasmania	8(3.8)	28(2.1)
Northern Territory	2(0.9)	15(1.1)
Australian Capital Territory	1(0.5)	26(1.9)
Employer		
Public hospital		99(46.7)
Community diabetes centre		42(19.8)
Other (clinical trials, other government agency)		40(18.9)
Self employed		14(6.6)
Private hospital		8(3.8)
Physicians office/ clinic		6(2.8)
University		1(0.5)
Nursing home (aged care facility)		0
Role (Multiple responses)		
Diabetes educator		187(88.2)
Registered nurse		130(61.3)
Client education		35(16.5)
Staff education		33(15.6)
Other (midwife, discharge coordinator, nurse practitioner)		18(8.5)
Dietitian		13(6.1)
Podiatrist		2(0.9)

Table 1: Demographic characteristics of Australian Diabetes Educators Association survey respondents, *continued....*

Characteristic	n (%) Total n=212
Highest education qualification	
Graduate certificate	96(45.3)
Graduate diploma	51(24.1)
Bachelor	29(13.7)
Master's degree	16(7.5)
Diploma	12(5.7)
Other (diabetes, management or teaching certificate)	6(2.8)
Doctorate	1(0.5)
Years in Diabetes Education	
< 1 year	16(7.5)
1-3 years	42(19.8)
4-9 years	78(36.8)
10+ years	75(35.4)
Hours employed in diabetes education	
Less than one hour per week	11(5.2)
1-8 hours per week	25(11.8)
9-16 hours per week	26(12.3)
17-24 hours per week	32(15.1)
25-32 hours per week	43(20.3)
33-40 hours per week	72(34.0)

Personal and professional development

One third (32.5%) said they remained current with the teaching and learning literature by reading at least once a month. The remainder indicated they were able to review information weekly (20.3%) or six monthly (20.8%). Within the previous year 92.5% had attended two or more days of continuing education on diabetes, with 38.7% of respondents attending between four and seven days. In addition, 51% of respondents had attended between two and seven days of continuing education on teaching and learning. The remaining respondents had attended either one day (16.5%) or less than four hours (23.1%) of continuing education on teaching and learning within the past year.

Daily workload distribution

Respondents were asked to estimate the percentage of time they spent daily fulfilling the various roles required of a diabetes educator (figure 1). The most common responses were tabulated to reveal that overall ADEA respondents considered they spent 50% of their day on client education, 20% on administrative tasks and the remaining third of each day equally distributed between research and quality improvement tasks; staff education; and other duties such as working clinical shifts.

Figure 1: ADEA survey respondents' composite workload per day

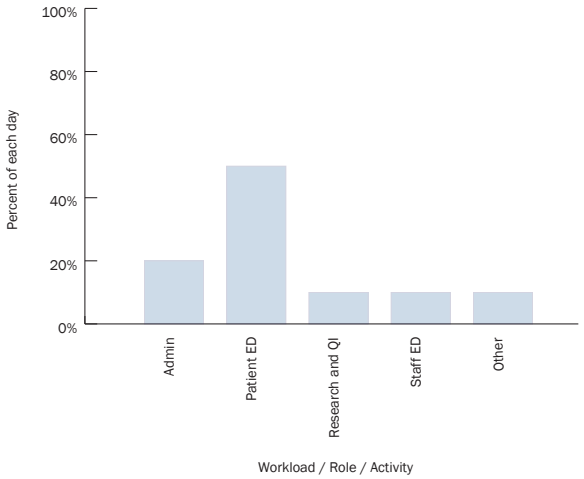
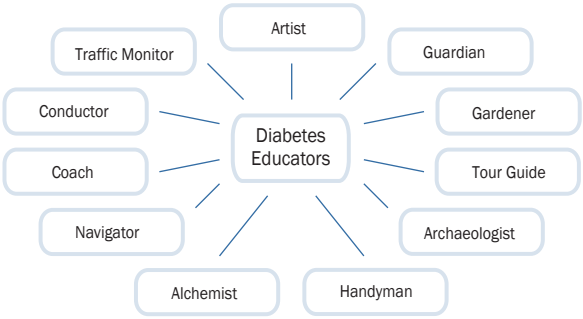


Figure 2: Analogies of a diabetes educator



Analogies of a diabetes educator

Within this section of the survey, respondents were asked to write a short analogy of how they saw themselves in their role. The example of a gardener sowing and nurturing a seed was provided. Respondents used many creative and imaginative analogies. A graphic presentation of some of the most common analogies is shown in figure 2. The figure presents how respondents compared themselves to coaches, artists, tour guides, archaeologists, alchemists, navigators, conductors, traffic monitors, and angels or guardians. Other analogies included: friends, mothers, chefs, surf life savers, ants, the segments of an orange, links in a chain, confessor and a roller coaster ride (the analogies are the subject of a separate paper).

Barriers and attributes to teaching and learning in diabetes education

Barriers

This section of the survey involved open-ended questions to enable respondents to discuss the issues they identified as important barriers and attributes to teaching and learning in diabetes education. The most common themes identified as barriers to *effective teaching* included: time; resources; the ability to individually assess the learners' needs; multiple cultures and languages and the level of teaching skills and diabetes knowledge of the educator (figure 3).

The themes identified as barriers to *effective learning* for the client included: emotional state and readiness to learn; literacy, language and cultural; personal expense (eg parking and transport); physical and mental health; time available; information overload and conflicting information from professionals (figure 3).

Figure 3: Attributes and barriers to effective diabetes teaching and learning

Effective Diabetes Education

ADEA members' survey 2006

Barriers

To effective teaching

- Time
- Resources
- Assessment of learning needs
- Culture / Language
- Teaching skills
- Diabetes knowledge

To effective learning

- Emotional State / ready to learn
- Literacy / Language / Cultural sensitivity
- Physical & mental health of client
- Hospital environment
- Time available
- Cost to client (transport, parking)
- Information overload
- Conflicting information

Attributes

Of the Educator

- Active listener
- Able to adapt and be flexible
- Individualised teaching
- Knowledge
- Communications Skills
- Friendly / Approachable
- Non-judgemental
- Professional

Of the Teaching Environment

- Comfortable and relaxed
- Quiet and free from distractions
- Friendly
- Private
- Safe and accessible
- Clean / uncluttered / ambience / non-clinical

Attributes

The themes identified as attributes of the diabetes educator included: being an active listener; being adaptive and flexible to individual needs; knowledge; communication skills; friendly and approachable; non-judgemental and professional (figure 3).

The most common themes identified as attributes of an effective diabetes education teaching and learning environment included: having a comfortable, friendly, quiet and relaxed place to teach and learn; the environment should be safe and clean, uncluttered and free of distractions (figure 3).

Effective strategies for diabetes teaching and learning

The final section of the survey contained 13 statements which asked respondents to rate a group of teaching and learning strategies for diabetes education using a five point analogue scale. The scale ranged from least important (1) to most important (5). For ease of analysis, the five categories were reduced to two (important 4 and 5 and not important 1, 2 and 3) to better reflect the responses to the statements provided (Elliott 2002).

Significantly, a majority of respondents reported that teaching strategies; providing education that enabled clients to make informed choices; helping clients learn from their choices and decisions; collaboratively writing goals and objectives; developing specific and tailored education programs; teaching in a way that matched the clients' experiences; using interpreters and involving families or significant others were important (range 95.5%-99.1%, p=0.000) (table 2). Other strategies that were considered important were the provision of written material before, during or after sessions and scheduling short focused sessions (range 82.5%-87.7%). Two thirds (66.5%) of respondents thought it was important to use audiovisuals during teaching sessions (66.5%; 95%CI, 1.59-1.72, p=0.000) (table 2). Only 44% of respondents thought education sessions for specific populations eg gender or for specific types of diabetes were important and 18.9% (95% CI, 1.12-1.23, p=0.000) rated standardised teaching programs as important or conversely 80.7% did not (95% CI, 1.12-.1.23, p=0.000) (table 2).

ADEA members who reported using handouts prior or during educations session as least important (30.6%, 95% CI, 0.24-0.37, p=0.010) were noted to work full-time (33-40 hours) but had attended less than three days professional development per year.

ADEA members who rated using a standardised teaching program as most important were predominantly community-based educators (42.9%, 95% CI, 0.01-0.06, p=0.025), held a Bachelor degree (35.7%, 95% CI, 0.01-0.05) and reviewed the education literature fortnightly (28.6%, 95% CI, 0.00-0.05, p=0.044).

Finally, the correlations between demographic characteristics and respondents who reported designing education for specific groups eg gender specific or specific for type of diabetes, as least important were more likely to work in physicians' offices (16.7%, 95% CI, 0.03-0.57, p=0.038), did not read education literature (33.3%, 95% CI, 0.09-0.72, p=0.034) and/or had attended professional diabetes development of less than one day in the previous year (16.7%, 95% CI, 0.03-0.57, p=0.038).

DISCUSSION

Even though the response rate to the survey was low, 16.2%, 212 respondents of the total 1306 ADEA members responded with enthusiasm as demonstrated by the time taken to provide lengthy text based responses to the open ended questions.

Demographic profile of respondents

The most concerning aspect of the demographic analysis was that, like the Australian nursing workforce, (Australian Health Workforce Advisory Committee 2004) diabetes educators/registered nurses appear to be an ageing work-force. Almost 80% were over 40 years of age and 5% were over 60 years of age; only 5% were within the age range of 'typical' new graduates (20-29 years), which leaves only 5% in the 30-39 age group to sustain the future of the specialty.

Seventy two percent of educators had been providing diabetes education between 4-10 years, including 35% who had been working as diabetes educators for more than 10 years. The question therefore arises as

to what processes are in place to nurture and educate the next generation of diabetes educators and what succession planning from the diabetes educators currently in these roles and the ADEA is in place to ensure the knowledge, wisdom and experience will be passed on.

No respondents were working within the aged care sector. Therefore it is unclear who provides diabetes care for this group of people which is a significant issue in a group known to have a high incidence of diabetes (Colagiuri et al 2002; Colagiuri 1996).

Table 2: Strategies for effective diabetes teaching and learning

Strategy	Important n=212 (%)	Not important n=212 (%)	P Value (95% CI)
Providing education in a way in which clients can make informed choices	210 (99.1%)	2 (0.9%)	0.001 (1.97-2.00)
Helping clients to learn from their choices and decisions	207 (97.6%)	5 (2.4%)	0.001 (1.95-1.99)
Collaboratively writing goals and objectives with each client	206 (97.2%)	4 (1.9%)	0.001 (1.93-1.99)
Developing an education program that is tailored to meet the specific needs of an individual client	205 (96.7%)	7 (3.3%)	0.001 (1.94-1.99)
Teaching content in a way that is useful and matches the clients experiences with diabetes	203 (95.8%)	7 (3.3%)	0.001 (1.91-1.98)
The use of interpreters with clients who have English as a second language	196 (92.5%)	14 (6.6%)	0.001 (1.87-1.95)
Involving clients' families or significant others in education sessions	196 (92.5%)	14 (6.6%)	0.001 (1.87-1.95)
The use of written material on diabetes prior to or during education sessions	186 (87.7%)	24 (11.3%)	0.001 (1.81-1.91)
Supplying clients with written material following education sessions	178 (84.0%)	34 (16.0%)	0.001 (1.79-1.88)
Scheduling education sessions that are short and focused on a limited number of concepts	175 (82.5%)	36 (17.0%)	0.001 (1.76-1.87)
Using audio-visual aids such as films, videotapes, overheads and slides during education sessions	141 (66.5%)	17 (33.0%)	0.001 (1.59-1.72)
Participation in a formal education class specifically designed for the clients' population (eg gender, type of diabetes)	95 (44.8%)	116 (54.7%)	0.001 (1.37-1.51)
Using a standardised teaching program that is applicable to all clients	40 (18.9%)	171 (80.7%)	0.001 (1.12-1.23)

p values derived from independent sample t-tests significance p≤ 0.05, CI = 95%

Two thirds of the respondents worked within diabetes education part-time, between 1-32 hours per week. Yet the text responses indicated that time was a barrier to effective education. It was not clear whether part-time employment was a personal choice (93% female) or due to available funding for the role (46% public hospital with 20% community based) (Colagiuri et al 2002). Whilst almost half the respondents worked in public hospitals, 42.5% also worked in rural areas where the number of people with diabetes is lower due to smaller populations. Thus it could be proposed that full-time employment in diabetes education is less likely to be funded in these areas.

Diabetes educators' knowledge, skills and practices in teaching and learning

The typical work day of the respondents was consistent in all areas of employment: 50% of educators' time was devoted to client education. The remaining time was distributed among administration, quality improvement activities, research, staff education, and other activities such as direct client care.

The barriers to effective client education were identified as a lack of time and resources and issues associated with bedside teaching. The issue of effective time utilisation was not explored in this survey but may be an area for future investigation. Education at the bedside continues to be undertaken despite its limitations such as background noise, interruptions and a lack of privacy; all barriers to effective teaching and learning. Respondents described the attributes of an effective teacher as being an active listener; able to adapt and be flexible; demonstrating a high level of knowledge; with good communications skills; friendly and approachable; and professional, and these qualities applied in any context (figure 3).

The most obvious conflict presented arising from the text responses was the desire to provide individualised, culturally, age and gender specific education within the environment of a diabetes epidemic "...too many clients, not enough of me!"

Using analogies to describe the role of a diabetes educator

The question asking respondents to describe their role in the form of an analogy or metaphor revealed an artistic and literary side to Australian diabetes educators.

The analogies presented in figure 2 represented the vocational aspects of the diabetes education role, as described by the respondents in the form of an analogy. These included comparisons to a traffic monitor, gardener and handyman. There were also more abstract analogies such as an ant, segments of an orange, and a lighthouse keeper. In addition, more personal relationships were identified through the analogies such as 'friend' and 'mother' which are references to a dependent relationship between the client and the diabetes educator and appear to be in conflict with adult learning and/or self-management principles embodied in the teaching and learning process currently employed in diabetes education.

Continuing education needs

The majority of respondents (91.5%) indicated they were able to attend at least 2 days of professional diabetes continuing education each year. However 6% of respondents indicated that remaining up-to-date about diabetes management was a barrier to effective teaching. This may be because attendance at continuing professional diabetes education may be about the management of diabetes rather than the education or skills required for effective teaching.

The majority of respondents (74%) also indicated they were able to read teaching and learning literature weekly, fortnightly or monthly. This was considered to be high given they had identified a lack of appropriate teaching skills as a barrier to effective diabetes teaching and learning. It is possible that the literature they are reading is about diabetes education rather than generic education or teaching and learning. It is also likely that reading about education, teaching and learning does not provide the diabetes educators with the necessary confidence or teaching skills for practice. Thus, to maintain their knowledge and skills in the continuously changing environment of diabetes management, diabetes educators need to focus their reading on generic education literature and undertake practice based learning opportunities about teaching skills in their continuing education programs.

RECOMMENDATIONS

The epidemic of diabetes is increasing in Australia. In the next decade there will be a need and demand for more diabetes education. The following recommendations are made on the basis of the data gathered in the study about the current teaching and learning practices of diabetes educators including the attributes and barriers that have been identified.

- Funding for the time and expense required for attending professional development should be included within diabetes educators' employment contracts as maintaining relevance and implementing evidence based practice as well as maintaining currency of the latest teaching and learning techniques is essential for an effective diabetes educator.
- Current diabetes educators should access the national ADEA mentorship programme which

will provide a continuum for the current clinical knowledge and expertise.

- Employers of diabetes educators and the ADEA need to look beyond the ADEA mentorship programme when succession planning to prepare for the exodus of the ageing workforce.
- Self governance by diabetes educators is required to meet national job specifications while working toward credentialing standards.
- Investigation into the diabetes educators' diverse analogies of their role and their relationships with clients.
- Further research into the teaching strategies used by diabetes educators is needed.

Limitations of the study

There are several limitations to this study. Firstly the low response rate to the survey limits the generalisability of the results. However these data maybe regarded as a snap shot of diabetes practice at the time of the survey and could be used as a guide for further research. It is also difficult to determine whether the ADEA members who responded to this survey represent a biased sample of highly motivated professionals. Therefore it is difficult to determine the extent to which the attributes and views of the sample of ADEA members, represents practice in 'the broader real world context'. The results of questions relating to how often specific teaching and learning literature was reviewed may be overstated because a clear definition of the literature sources was not provided. There may have been a conception that diabetes education material alone was a sufficient teaching and learning source. A final limitation of the study is that the e-survey was specifically designed for this project and the scales and items were not previously validated.

CONCLUSION

The results indicate that the ADEA members who responded to the survey were highly qualified, experienced and motivated diabetes educators. The majority were aware of the teaching and learning needs of their clients and the skills they require to deliver best practice education. Most educators were committed to participating in some professional continuing education to improve and maintain their competency.

Strategies to address the barriers to effective teaching and learning in diabetes education in both the acute and community contexts need to be addressed. Issues such as limited time and resources, individualised approaches and opportunities to maintain advanced skills and knowledge remain a continuing challenge for diabetes educators.

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