A pilot study to determine levels of diabetes knowledge among health care workers in nursing homes

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Received: 24 February 2012
Accepted in revised form: 2 July 2012

Summary

Health care workers employed in nursing homes need sufficient diabetes knowledge to make adequate decisions in order to optimise diabetes management and minimise complications which may arise from poor diabetes control.

The aim of this study was to determine levels of diabetes knowledge among health care workers when presented with a case description regarding an older person. Ten health care workers were asked to read a paper copy of the case description, reflect upon it and express their understanding of the case in question.

The main results were summarised in two categories: namely, *diabetes knowledge in relation to the presented case description* and *general diabetes knowledge*. Some of the respondents considered the symptoms to be related to hyperglycaemia, while others were uncertain. Health care workers' general diabetes knowledge varied.

In order to optimise diabetes management and minimise complications, health care workers' knowledge gaps in diabetes need to be reduced through regular diabetes education.

Eur Diabetes Nursing 2013; 10(1): 13–18

Key words

diabetes knowledge; health care workers; nursing homes

Background

In many countries there is a rapidly ageing population and recent research has highlighted an increase in the number of older people (≥65 years of age) with diabetes.[1–4] As a result, there are now more people with diabetes living in nursing homes. Many residents might be dependent on help from personnel to manage their diabetes as they no longer manage by themselves. United Kingdom studies have found a diabetes prevalence of 12%[2] and 9%[3] in residents living in nursing homes. UK good clinical practice guidelines for care home residents with diabetes have reported that the known prevalence of diabetes is 26% among those living in residential and nursing homes.[5] An American study has reported that one out of four people ≥65 years of age, who live in nursing homes, have diabetes.[4] Moreover, undiagnosed diabetes was found in residents with dementia who live in similar circumstances.[6] In Sweden, the diabetes prevalence is 10% in people >70 years old and approximately 20% in those >80 years of age.[7] The results from a Swedish study (n=800) showed that people with diabetes who lived in care homes had poorer disease control than those living in their own homes.[8]

People with diabetes may have different needs and, after admittance to a nursing home, many residents may require self-care assistance.[9] Health care workers are those who continuously care for the residents. This implies that staff employed in these homes have adequate diabetes knowledge to optimise diabetes management and minimise the complications which may arise from poor diabetes control. Many older people also have concomitant diseases and diabetes is perhaps only one of many health problems. In addition, there may be complications related to the diabetes that have evolved. Several people living in institutions often have suboptimal care.[10]

Swedish National Guidelines highlight that diabetes management in older people should aim for freedom from diabetes symptoms, and that the goal for mean blood glucose control (HbA_{1c}) has to be individualised. A high blood glucose value has a negative effect on cognitive function in older people and could affect both their well-being and self-care abilities. Furthermore, a high blood glucose value might give rise to tiredness and inactivity as well as apathy.[11]

Hyperglycaemia and dehydration may also lead to confusion, poor wound healing, and an increased risk of pressure ulcers. In addition, high blood glucose values increase the risk of falls and of impaired dental status. Urine leakage at night[12] is another potential problem. Although the aim is to achieve strict blood glucose control in this age group, the risk of hypoglycaemia must also be considered.[13]

Health care workers in nursing homes are predominantly represented as carers for older people. However, the personnel often do not have specific education in diabetes. Furthermore, it might be considered that some health care workers may not have met a person with diabetes who also has complications due to the disease. It is a priority that the individual with diabetes should feel confident and, when needed, health care workers should be capable of helping with specific diabetes-related problems. In addition, health care workers must have adequate knowledge to understand the symptoms of hyper- and hypoglycaemia.

An earlier study has reported poor diabetes knowledge in health care aides, as only 34% (n=335) correctly answered questions regarding hyperglycaemia symptoms. This is considered a poor result in terms of understanding the diabetes condition and highlights the need for increased education in diabetes.[14] Another study performed in Sweden has reported that lack of diabetes knowledge may give rise to the occurrence of medical mishaps.[15] In addition, an earlier American study reported poor diabetes knowledge in staff caring for older people living in nursing homes.[16]

The current study was designed to obtain a deeper insight into health care workers' diabetes knowledge when caring for diabetic people living in nursing homes. Thus, the aim of this study was to determine levels of diabetes knowledge among health care workers when they were presented with a case description regarding an older person.

Study design and methods

Design

The study had a qualitative design and data were analysed using content analysis.[17]

Case description

Albin Persson lives in a nursing home. He is a widower, 76 years of age, and he has had diabetes for 20 years. He has a daughter who visits him regularly.

Albin is treated with both tablets and insulin. He receives Insulatard, 8 units at 21.00; tablets: metformin at 500mg – 1 tablet morning and evening.

Albin has good hearing, but difficulties with his eyesight. He has good appetite. He needs help to go to the toilet. He does not want to stay in bed during the day and spends most of his time sitting quietly in a chair in his room. Three months ago, he had a little wound on his big toe which hasn't healed.

Blood sugar tests are done regularly once a week. During the last 6 months blood sugar levels have been within normal ranges. Weight: 88 kg; height: 1.80m; BMI: 27.

Specific situation

During the last few days, Albin has had a bad cold with a temperature. He has lost his appetite and eats poorly. However, he is continuously thirsty and wants to have more to drink than usual. He has also complained that his sleep has been bad for the last couple of nights. At night he has to pass urine more than usual and he has not been able to get to the toilet in time, resulting in wet bedclothes. In the afternoon when it is time to serve coffee, you notice that Albin seems more tired than usual and he is irritated that you serve his coffee so slowly. He is not usually bad tempered. Now he doesn't want anything to eat with his coffee, and says that he feels a little bit sick.

Box 1. Case description

Participants

Health care workers employed in five separate nursing homes in mid Sweden were asked to participate, and all agreed to do so. Five of them had a two-year vocational qualification but only one had participated in a two-day course in diabetes. Students participating in these vocational qualification programmes learn about health, ill-health, disabilities, medicine, pedagogy, sociology, psychology and care science. Diabetes is not highlighted as a subject on its own. Four respondents had participated in shorter courses for working in nursing homes. One of the respondents had no nursing education. Six of them had been delegated to give insulin injections, and in view of this the registered nurse in charge needed to teach them about insulin administration. The health care workers' mean age was 43 years (range 23–64). All of them (n=10) were employed full time and had been working at the nursing home for a mean of eight years (range 3–17). All five homes participating in the study had residents with diabetes.

Procedure

Prior to the study, a meeting was held with the physician in charge and the manager at a nursing home not included in the study. The intention was to obtain a case description that highlighted common diabetes problems in older people and also described a specific situation that could easily occur in a care situation. The current case description was compiled on the basis of this meeting, on literature review within the field, and on various medical records for older people with diabetes. Prior to the interviews, the version devised was scrutinised by the physician and manager, arising from which no alterations were made.

All interviews were done individually, lasted for 40–60 minutes, and took place in each nursing home. The health care workers were asked to read a paper copy of the case

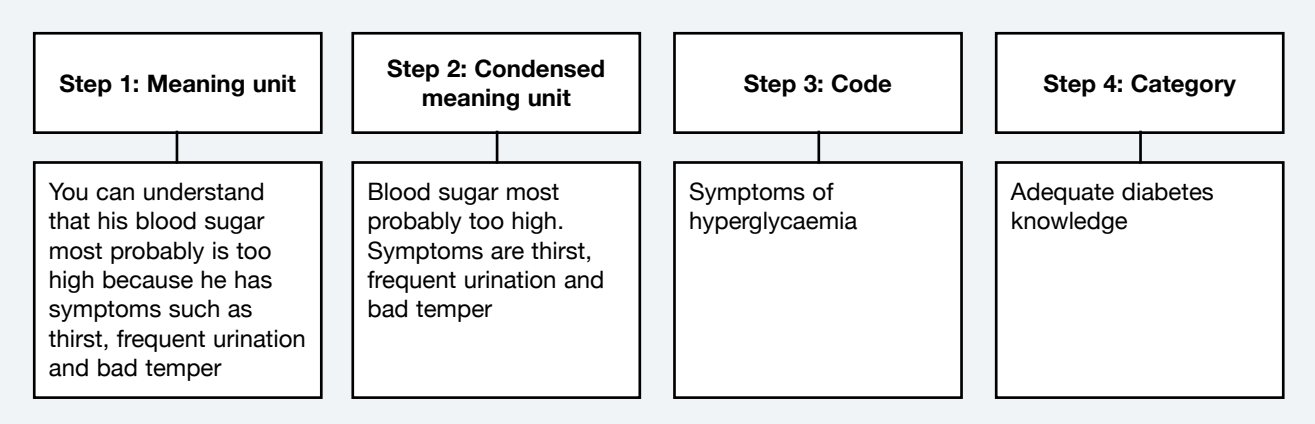

Figure 1. Example of the analysis process presenting the four steps: meaning unit, condensed meaning unit, code, and category

description (Box 1), and then to reflect upon it for a few minutes. Thereafter, they were asked to provide their understanding of the case study. In addition to this, they were also asked about their general diabetes knowledge. The questions concerned diabetes symptoms, vision, foot care, meal times, diabetes treatment, and hyper- and hypoglycaemia symptoms. All answers were tape recorded.

Data analysis

The tape-recorded interview material was transcribed in its entirety with participants' consent in all cases. The text was analysed using a content analysis in four steps according to Graneheim and Lundman.[17] The steps described below were used.

- *Step 1.* The text was scrutinised and meaning units were identified in relation to the case description and different question areas. The respondent's own words constituted the meaning unit, which is a sentence or paragraph from the transcribed text.
- *Step 2.* From this sentence, the text is condensed and all 'extra words' are removed in order to get the overall meaning of the content. This is the condensed meaning and is the description close to the text, encapsulating and shortening the content without changing it.
- *Step 3.* The condensed meanings and the interpretations were abstracted and labelled with codes. Throughout the analysis process the original text was considered when formulating the codes. Comparisons were done looking for similarities and differences in the codes.
- *Step 4.* An interpretation of the health care workers' discussions was done and categorised, and a decision was made as to whether or not this was relevant in relation to the case description.

Figure 1 provides an example of the analysis process presenting the four steps: meaning unit, condensed meaning unit, code, and category.

Ethical considerations

Approval was obtained from the trade union secretariat of Uppsala County Council and from the five managers at the different nursing homes. All participants were approached by the nurse in charge at each of the five nursing homes, and all 10 health care workers agreed to participate. They received information by letter and were contacted via telephone by one of the researchers; verbal informed consent was obtained. All health care workers who had given their informed consent to participate in the study were assured of their work integrity so that it would not be possible to identify an individual person in the research report. The participants were also guaranteed confidentiality and told that they could withdraw from taking part in the study at any time. The study was performed according to ethical principles applied in nursing research.[17]

Results

The results are summarised under two categories – namely, *diabetes knowledge in relation to the presented case description*, and *general diabetes knowledge*. Each category has two sub-categories: adequate diabetes knowledge and below adequate diabetes knowledge.

Diabetes knowledge in relation to the presented case description

This category emerged from health care workers' narratives about the patient's symptoms in the given case description. The respondents were expected to comment on the patient's ongoing thirst resulting in his desire to drink more than usual. In addition, the symptom regarding increased frequency in passing urine during the night-time was supposed to give rise to comments.

Adequate diabetes knowledge. One respondent recognised the symptoms correctly and said: *'When you have a patient like this man, you know*

that it is diabetes behind it and you notice that he is constantly thirsty' (6).

Another respondent said: *'My first thought is that his sugar has been too high. This is so, as he has bad temper, urinates more, is tired and is thirsty'* (5).

Below adequate diabetes knowledge. Some health care workers seemed to have below adequate diabetes knowledge about what the patient's problem might be and their answers indicated levels of uncertainty. Table 1 presents excerpts from health care workers' clinical reasoning regarding the patient's symptoms.

One respondent said: *'He has lost his appetite. You should perhaps test his blood sugar level a bit more often. You may have to change his insulin doses. This is a bit difficult. It might be that the blood glucose level is too low'* (8).

Another one said: *'Do not know very well how fever and cold influence the situation'* (3).

General diabetes knowledge

The main category, general diabetes knowledge, was labelled with the two subcategories: 'adequate' and 'below adequate' diabetes knowledge. The health care workers answered questions about general diabetes knowledge in relation to the presented patient description and daily routines at the nursing home in which they were employed.

Adequate diabetes knowledge. Some respondents expressed doubts about meal times and highlighted worries about too long a period between the evening and morning meals.

One cited: *'I think the times for the meals are OK, but there should be something during evenings as well. There are many hours between 19.30 and 8.00 in the morning'* (4).

Another respondent said: *'I think the meals are quite normal for a nursing home. It is very important that residents get the tablets in the morning'* (3).

Statements indicating adequate diabetes knowledge	Statements indicating below adequate diabetes knowledge
As he has frequent urination and bad temper, maybe the blood sugar is too high (2)	It seems when looking at the symptoms that he has hypoglycaemia sensations (1)
As he is thirsty, the blood glucose values are higher (3)	I wonder why this man has both insulin and tablets; I have never met that before (7)
As his temper is bad, and he urinates more and is tired and thirsty, his sugar has been too high (5)	You can see that he is sitting quietly and, so, I think he needs some help in order to walk and get some exercises. This is a bit difficult; it might be that the blood sugar is too low (8)
As he is continuously thirsty and has more to drink than usual, and sleeps badly, I think the blood sugar is too high (6)	It is not good that he eats so little and that he is so thirsty and that he urinates much as he is irritated – surely it depends on that the sugar isn't as it should be (10)
I look at the current situation, and in either the tablets or the injection there must be a change; he doesn't feel well, his medicine dose is not right (4)	
He has a high blood sugar, which is quite common in infections. You need more units of insulin when you have an infection. The body needs to get rid of the increased blood sugar levels (9)	

Table 1. Excerpts from health care workers' statements in relation to the case description (individual participants are denoted by ID number in parenthesis)

The patient in the current case description had a small wound on his big toe which had not healed for three months. Some of the health care workers highlighted the risk of amputation due to bad foot care.

One respondent said: *'Yes, we keep it clean, make dressings and keep it under control the whole time and we hope it will heal. It might turn into an amputation – you really have to check it, if you really want to avoid an amputation'* (4).

Another respondent demonstrated adequate knowledge about foot problems and said: *'If you have diabetes it is easy to get a wound on your toe. You need foot care and you need to check the wound regularly. You need not have a dressing all the time: sometimes the wound needs to be without a dressing. You must use good stockings and good shoes. You need to check the feet every day'* (2).

Another diabetes knowledge area concerned the patient's vision. One respondent said: *'Yes. You think that it is an effect of* [the fact] *that he has had diabetes for 20 years. Most probably, there is help for it. I do not know how careful you are concerning elderly people and vision control. I have noticed that you do not take that much responsibility for older people – especially when they come to places like this. Unfortunately, it is like this'* (9).

Below adequate diabetes knowledge. Below adequate knowledge was expressed by the respondent who said: *'At this nursing home we check blood sugar once a month and we check it four times that same day. But maybe it should be enough to do it twice only – in the morning and before dinner. But it is not such a good idea to check so many times. At this home, they are quite stable so you need not check very often'* (2).

Another health care worker showed uncertainty about hyperglycaemia, as she said: *'I have never seen a patient with too high a blood sugar'* (4).

One respondent said: *'You have to test the blood glucose and then it might be too low, so you have to give him something'* (10).

Three meals a day is considered adequate for blood glucose control in normal circumstances, but it could be expected that the health care workers had expressed something about snacks in between meals when it comes to controlling diabetes levels. One respondent said: *'Regarding the meals, they are good: three meals a day is OK – that is what it should be'* (5).

Some health care workers showed below adequate knowledge about foot problems and one person said: *'A wound on the toe is difficult to heal'* (5).

Regarding diabetes and eyesight, one person said: *'I think his problem has to do with his insulin: there is something about the administration of insulin'* (1).

Discussion

The results showed that the level of diabetes knowledge varied among the health care workers. Many of them had adequate diabetes knowledge and they understood that the person in the current case description had hyperglycaemia. However, some health care workers did not consider that the patient's symptoms could be due to hyperglycaemia.

Surprisingly, none of the health care workers raised the problem of wet bedclothes. This could be a sign of hyperglycaemia, and it could have been expected that some of the respondents would have paid attention to this. Neither had any of the health care workers made an association between poor sleep and thirst or increased passing of urine. This means that symptoms of both hyper- and hypoglycaemia have to be highlighted in future education and special emphasis must be placed on understanding the symptoms and deciding what needs to be addressed.

These results are in line with Fors and Attvall's[18] recommendations that staff in nursing homes need further education and ongoing training. The respondents' uncertainty about how to understand the symptoms are also in line with Ödegård's study,[15] in which very few assistant nurses considered their own competence to be adequate concerning diabetes. The importance of staff education has also been put forward by Deakin and Littley[19] who found that it increased knowledge and was related to improved quality of care up to one year after an educational programme.

However, our results could be considered an expected outcome as only one of the health care workers had participated in a two-day course in diabetes. Although it could be argued that all health care workers are not expected to have medical education as such, it is nevertheless important that they have adequate diabetes knowledge in order to assist and support patients who do not manage by themselves. In addition, it is important that staff in homes for older people have adequate knowledge of diabetes in order to be able to understand and identify different symptoms specific to those with diabetes. This is in line with UK guidelines which highlight the importance of training and educational initiatives for staff working in residential homes.[5] A question remains, however, as to whether work in residential homes caring for older people is undervalued in society, which in turn could be a reason why many less educated people have been attracted to find jobs in these homes.

In order to achieve a situation as close to reality as possible, a case description was used for the basis of interviews. It was considered that this was the best procedure, rather than the use of multiple choice questions, as the respondents would be able to report on their own experiences and would not be tied to predetermined questions.

The health care workers could relate to the described situation and they had the opportunity to provide their thoughts on this, which ensured the reliability of our study. Reliability was also strengthened by the fact that the case description was based upon discussions with the physician and the manager in charge at a nursing home. This enables repetition of the study.[20]

The results from the interviews have been presented and the citations are intended to give an idea of the knowledge of diabetes among the participating health care workers. The transferability would thereby be assured. When applying the content analysis method, it is most important to select appropriate meaning units. Those statements that best answered the research questions were picked, whereby credibility could be achieved.[17] In addition, the researchers had full agreement regarding the answers provided, which assured credibility.[21]

The respondents in this study had different educational backgrounds, and this could be a weakness in interpreting the answers. It

is possible that the results would have been different if we had caught up with those who had received a good education in diabetes. On the other hand, the results showed the current situation among health care workers employed in nursing homes in this area in Sweden. Another weakness is that we focused on hyperglycaemia only. A future study should also include a case description which highlights hypoglycaemia problems, thus achieving a broader perspective about diabetes knowledge among health care workers.

Conclusion

The study results show that health care workers employed in nursing homes for older people have different levels of knowledge in diabetes. An outcome of this is that responsible authorities must provide more basic and ongoing training in diabetes for care workers. The growing number of older adults with diabetes both in Sweden and in other European countries highlights the importance of placing emphasis on this training. Therefore, we suggest that programmes should be put in place using different case descriptions. Preferably, a diabetes specialist nurse would be involved and assist health care workers in increasing their diabetes knowledge. Based upon the current results, the next step should be to design an intervention study.

Acknowledgements

We would like to thank all the study respondents as well as the managers at the nursing homes who so willingly participated in our study.

The current study was supported by a grant from Stiftelsen Ragnhild och Einar Lundström, Stockholm.

Declaration of interests

There are no conflicts of interest declared.

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Diary dates

PsychoSocial Aspects of Diabetes (PSAD) Spring Meeting

12–14 April 2013
Croatia
Website: www.psad-easd.eu

European Diabetes Epidemiology Group Conference 2013

13–16 April 2013
Potsdam, Germany
Website: www.edeg.org

Hot Topics in Obesity

23 May 2013
Postgraduate Medical Centre, Plymouth, UK
Website: www.heart.org.uk

Heart UK 27th Annual Conference

5–7 July 2013
UWE Exhibition and Conference Centre, Bristol, UK
Website: www.heart.org.uk

FEND Annual Conference

20–21 September 2013
Barcelona, Spain
Website: www.fend.org

EASD Annual Meeting

23–27 September 2013
Barcelona, Spain
Email: secretariat@easd.org
Website: www.easd.org