Registered nurses' knowledge of medical care for older adults with diabetes in long-term care facilities in Taiwan

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ABSTRACT

Background: One in every three older adults who lives in a long-term-care facility in Taiwan has diabetes. Thus, examination of diabetes management for older adults in long-term-care facilities is warranted.
Aims: We investigated the current diabetes management for older adults, nurses' knowledge of diabetes care, and the factors associated with nurses' knowledge of diabetes care for older adults in long-term care facilities.
Method: This cross-sectional survey study was conducted from July to December 2015. A questionnaire about nurses' knowledge was developed, and then descriptive statistics and a multiple linear regression were used.
Findings: A total of 41 nurses (82% response rate) from five long-term-care facilities were enrolled. In total, 70.7% of nurses had experience transferring older adults with diabetes who live in long-term-care facilities to an emergency department. The most common reasons were hyperglycemia (n = 24, 58.5%), followed by hypoglycemia (n = 19, 46.3%). Nevertheless, items on the symptoms of ketoacidosis identification (9.8%) had the lowest correct answer rate, and nearly half (48.8%) of the nurses incorrectly answered a question about the value of glycated hemoglobin A1C for older adults. Diabetes education (β = 0.528, p = 0.007) was the only statistically significant factor that contributed to nurses' knowledge of diabetes management for older adults.
Conclusions: These study findings provide an initial basis for considering the development of diabetes management protocols, including nurses' continuing education, for older adults in long-term-care facilities.

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Summary of relevance

Problem

Little is known about nurses' knowledge of medical care and practice in regard to older adults with diabetes in long-term care facilities in Taiwan.

What is already known

The majority of older adults with diabetes who live in long-term care facilities are frail and vulnerable and, thus, require special diabetes care considerations as compared to healthy older adults who live in the community.

What this paper adds

Nurses have insufficient knowledge of diabetes care for older adults, especially in regard to the identification of hyperglycemia symptoms. We found that diabetes continuing education is the only factor associated with diabetes care knowledge, controlling for nurses' education, and work experience.

1. Introduction

The latest census showed that there were 3.2 million (13.39% of the total population) adults aged 65 and older in Taiwan, of whom 0.4 million (12.5%) had a disability (Social and Family Affairs Administration, 2016). The high percentage of the elderly population with a disability means that healthcare providers need to focus as much on managing chronic, noncommunicable diseases as on acute conditions (National Institute on Aging, 2011). In March 2017, 1.5% of older adults lived in long-term-care facilities (LTCFs) (Social and Family Affairs Administration, 2016), indicating that the management of older adults' health problems in the context of LTCFs should be a focus of concern. Diabetes mellitus (DM) is a very common disease among aging populations and has a high prevalence among individuals in LTCFs. In the United States, the cost of dia-

betes care in LTCFs was US$19.6 billion in 2012 (American Diabetes Association, 2013a). In Taiwan, 29.6% of older adults who live in LTCFs have diabetes, and all are moderately to severely functionally disabled (Liu et al., 2014). The high prevalence of older adults with diabetes in LTCFs and their overall functional impairments indicate the frailty of this population and that proper diabetes management is an area of great need.

Diabetes management in LTCFs can be challenging for many reasons, including the elderly's frailty and disability (Gadsby, Barker, & Sinclair, 2011; Zhang, Decker, & Luo, 2010). The optimum blood sugar target goal for older adults in LTCFs varies, based on their frailty, and, thus, may differ from what healthcare professionals generally set as a goal for older healthy adults who live in the community (Herzig Mallery, Ransom, & Steeves, 2013). The ADA, European Association for the Study of Diabetes, and the American Medical Director Association all recommend a target glycated hemoglobin (HbA1C) of 7%–7.5% or lower for healthy older adults (Inzucchi et al., 2015), but the European Diabetes Working Party for Older People recommended a target HbA1C of 7.5%–8.0% for frail older adults who are at risk of hypoglycemia, particularly if they use insulin or have a disability. An HbA1C of 8.0%–8.5% could be recommended, but guidelines developed in Canada suggested that an HbA1C of 8.0%–9.0% or even higher could be acceptable for frail adults (Sinclair et al., 2011). Tight control of glucose level, which could prevent the occurrence or minimize the severity of diabetes comorbidities was not evident in older adults (The ADVANCE Collaborative Group, 2008). Achieving good quality of life and preventing diabetes-related complications for older adults in LTCFs can be challenging because this population is usually frail, has a long duration and various severities of diabetes, and has multiple comorbidities. Further, older adults' preferences should be take into consideration when determining and prioritizing diabetes management plans (Aaron, 2014). To optimize diabetes care and its benefits, healthcare providers need to understand the LTCF population.

Registered nurses (RNs) provide direct, professional care to residents in LTCFs in Taiwan. As an essential member of the care team in LTCFs, RNs' knowledge of diabetes care is very important (Aaron, 2014). A recent integrative review showed, however, that there were significant deficits in diabetes care knowledge among nurses across developed and developing countries (Alotaibi, Al-Ganmi, Gholizadeh, & Perry, 2016). Previous research has addressed issues of RNs' knowledge of diabetes care for older adults, mainly in acute care settings, not in LTCFs (Alotaibi et al., 2016). To improve diabetes care in LTCFs, an understanding of current practices and RNs' knowledge of diabetes care for older adults is essential. Therefore, the purpose of this study was to investigate RNs' knowledge of and experiences with medical care for older adults with diabetes in LTCFs in Taiwan and the factors associated with their knowledge.

2. Methods

2.1. Aim

The aim of study was to investigate RNs' knowledge of and experiences with medical care as related to older adults with diabetes in LTCFs. To this end, the following research questions were investigated:

1 What is the current status of medical care provided to older adults with diabetes in LTCFs?
2 What is RNs' knowledge of medical care for older adults with diabetes in LTCFs?
3 What factors are associated with RNs' knowledge of diabetes care?

2.2. Design and sample

This study used a cross-sectional survey research design. All RNs from five LTCFs in northern Taiwan were invited to participate in the study. The inclusion criteria were RNs who had a nursing licensure and had worked in these participating LTCFs for at least 3 months. RNs who did not provide direct, professional nursing care or who did not have experience with diabetes care for adults aged 65 or above in LTCFs were excluded. The researcher invited all eligible RNs to complete a self-administered survey questionnaire, which took 10–15 min. A minimum of 36 RNs was needed for an effect size of 0.35 for the F test and a power of 0.8, with an alpha of 0.05, using G*Power 3.1.5 software (Faul, Erdfelder, Buchner, & Lang, 2009) as well as three predictors.

2.3. Study tools

Because there was no existing questionnaire to survey RNs' diabetes care for older adults in LTCFs, a questionnaire was developed by the researchers. The survey questionnaire was found to have good content validity (an overall content validity index of 0.83) and a good reliability analysis (KR-20, α = 0.77). The survey questionnaire comprised three sections: demographic information, current diabetes care in the LTCF, and RNs' knowledge of medical care for older adults with diabetes.

The questionnaire on knowledge of diabetes care for older adults was developed based on "Standards of Medical Care in Diabetes-2013" (ADA 2013a), which was the latest version when we sent out the survey, and then was modified for nurses who work in LTCFs. Questions were multiple choice, with only one correct answer per question. One point was given for each correct answer. The minimum score was 0 and the maximum was 10, with a higher score's indicating better knowledge of diabetes care for the elderly.

2.4. Data collection and ethical considerations

This study commenced after approval was granted by the university institutional review board (IRB #201501037) and participating LTCFs. The researchers explained the study objective and procedures to nurses during their monthly meetings and provided information, including the questionnaire and consent form. Participants' confidentiality and anonymity were maintained. All returned survey questionnaires remained anonymous, and data were stored in a password-secured computer.

2.5. Data analysis

All analyses were performed using IBM SPSS 19.0 statistical software. Data processing methods included descriptive and inferential statistics with statistical significance at α = 0.05. Data were analyzed, using descriptive statistics and multiple linear regression analysis.

3. Results

3.1. Demographic characteristics

Table 1 shows the RNs' demographic backgrounds. A total of 50 surveys within five LTCFs were distributed, and 41 surveys were returned (response rate of 82%). All study participants were female, and their mean age was 41.73 (SD = 11.48) years, with an average acute care experience of 7.31 (SD = 8.54) years and 5.8 (SD = 5.04) years in LTCFs. The majority had an associate's degree (46.3%) and had received continuing education on diabetes care (56.1%).