



Examining perceived and actual diabetes knowledge among nurses working in a tertiary hospital



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ABSTRACT

Background: With the worldwide increase in the incidence and prevalence of diabetes, there has been an increase in the scope and scale of nursing care and education required for patients with diabetes. The high prevalence of diabetes in Saudi Arabia makes this a particular priority for this country.

Aim: The aim of this study was to examine nurses' perceived and actual knowledge of diabetes and its care and management in Saudi Arabia.

Methods: A convenience sample of 423 nurses working in Prince Sultan Medical Military City in Saudi Arabia was surveyed in this descriptive, cross-sectional study. Perceived knowledge was assessed using the Diabetes Self-Report Tool, while the Diabetes Basic Knowledge Tool was used to assess the actual knowledge of participants.

Results: The nurses generally had a positive view of their diabetes knowledge, with a mean score (SD) of 46.9 (6.1) (of maximum 60) for the Diabetes Self-Report Tool. Their actual knowledge scores ranged from 2 to 35 with a mean (SD) score of 25.4 (6.2) (of maximum of 49). Nurses' perceived and actual knowledge of diabetes varied according to their demographic and practice details. Perceived competency, current provision of diabetes care, education level and attendance at any diabetes education programs predicted perceived knowledge; these factors, with gender predicted, with actual diabetes knowledge scores.

Conclusion: In this multi-ethnic workforce, findings indicated a significant gap between participants' perceived and actual knowledge. Factors predictive of high levels of knowledge provide pointers to ways to improve diabetes knowledge amongst nurses.

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1. Introduction

The role of nurses in caring for and educating patients with diabetes has dramatically increased in scope and scale with the worldwide increase in the incidence and prevalence of diabetes. There are currently 415 million people diagnosed with diabetes globally (International Diabetes Federation, 2015); this is projected to rise to 642 million by 2040. People from low/middle-income and developing countries such as Saudi Arabia are, in particular, at increased risk. Effective management of diabetes is essential to reduce the early and long term complications of diabetes and to inhibit the onset of associated chronic

diseases (Hark, Deen, & Morrison, 2014). Diabetes self-management requires dietary management, adherence to medication regimens and blood glucose monitoring. Patients' outcomes have been demonstrated to improve when patients receive up-to-date, complete and accurate information about diabetes and its care and management (American Diabetes Association, 2013). Nurses are an indispensable part of this process, guiding patients' self-care practices through education and counselling (Coulter, Parsons, & Askham, 2008).

However, studies have indicated knowledge deficits among nurses in various areas of diabetes care and management. Inadequate knowledge of medication has been found among American and Jordanian nurses (Gerard, Griffin, & Fitzpatrick, 2010; Yacoub et al., 2014) and insufficient knowledge of insulin treatment among 27% of Pakistani registered nurses (RNs) (Ahmed, Jabbar, Zuberi, Islam, & Shamim, 2012). Australasian studies found that some 50% of participating nurses did not know that neuropathy, nephropathy, erectile dysfunction, cardiovascular and cerebrovascular diseases were associated with diabetes (Daly, Arroll, Sheridan, Kenealy, & Scragg, 2014; Livingston & Dunning,

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2010). Studies in the United State (US) and United Kingdom (UK) also indicated RNs needing further training in blood glucose monitoring (BGM) (Gerard et al., 2010; Nash, 2009), as was also the case for 75.1% of Nigerian nurses (Oyetunde & Famakinwa, 2014). In a Korean study, 80% of practice nurses scored poorly on diabetes dietary questions relating to sources of carbohydrates for diabetes patients (Park et al., 2011). A qualitative study conducted in Sweden reported that none of the 22 participating enrolled nurses could distinguish the different types of diabetes or the symptoms of diabetes (Olsen, Granath, Wharén, Blom, & Leksell, 2012). Together these findings indicate that the nursing workforces internationally may experience significant knowledge deficits across many areas of diabetes care (Alotaibi, Al-Ganmi, Gholizadeh, & Perry, 2016). However, no study was found that investigated nurses' knowledge of diabetes and its care and management in the Saudi health care system. Saudi Arabia's health care system comprises 60% government-run and 40% private organisations. The system suffers from a shortage of local healthcare professionals including nurses (Aldossary, While, & Barriball, 2008). Nurses are recruited from many other countries including Australia, the UK, India, the Philippines, South Africa and the US (Al-Homayan, Shamsudin, & Subramaniam, 2013). As a result, the nursing workforce of Saudi Arabia is predominantly comprised of nurses who have been educated and trained in a large number of other countries, under widely differing curricula. Therefore, they are likely to possess differing levels of knowledge and understanding of diabetes and its management, and of the diabetes-related education needs of patients. This study, conducted in a Saudi governmental hospital, offers a first look at the level of diabetes knowledge held by these nurses in Saudi Arabia and helps to fill this gap in the literature.

2. Aims and objectives

The aim of this study was to examine nurses' perceived and actual knowledge of diabetes and its care and management in Saudi Arabia.

The specific objectives were to:

- 1) Identify nurses' perceived knowledge and skills in relation to diabetes and its care and management.
- 2) Assess the accuracy of nurses' knowledge (actual knowledge) of diabetes and its care and management.
- 3) Examine relationships between nurses' actual knowledge of diabetes and their perceived knowledge, socio-demographic and practice related data.
- 4) Identify factors predicting nurses' perceived and actual knowledge of diabetes and its care and management.

3. Methods

3.1. Design

This study is one part of a mixed-method study addressing nurses' knowledge of diabetes in Saudi Arabia. It reports the results of the quantitative phase, which employed a cross-sectional survey design to assess nurses' perceived and actual knowledge of diabetes and its care and management, including knowledge of diabetes medications, BGM, nutrition, diabetes pathology and symptoms, diabetes foot care and complications.

3.2. Setting

The cross sectional survey recruited participants from a wide range of in-patient and outpatient departments at the Prince Sultan Medical Military City (PSMMC) in the Kingdom of Saudi Arabia. The PSMMC is the largest hospital in Riyadh, the capital city of Saudi Arabia, offering both primary and tertiary health care. It has a primary healthcare centre, and a range of subspecialties including cardiac surgery, medicine, surgery, neurology, nephrology, urology and obstetrics/gynecology. The PSMMC is operated by the Ministry of Defense in Saudi Arabia; it

provides healthcare to military employees and their dependents and accepts any emergency and critical cases under specific regulations. Approximately 3000 nursing staff from multiple nationalities work in this hospital.

3.3. Sample and sample size

The study population consisted of Saudi and non-Saudi RNs who met the study inclusion criteria of being employed in the research site hospital (PSMMC) and having a minimum of six months nursing work experience. Nurses who worked in managerial positions, those who were newly appointed, or employed in support services such as operating theatres, radiology, dialysis, laboratory or endoscopy units were excluded. A convenience sample of nurses meeting the inclusion and not the exclusion criteria was sought. Excluding those nurses employed in managerial positions and support services, the estimated population comprised 1500 front-line nurses. A sample size of 305 participants was calculated to demonstrate a moderate sized effect ($r = 0.30$) with a 5% level of significance and 80% power level (Munro, 2005). The results of an earlier local study indicated an anticipated response rate of approximately 50% (Al-Otaibi, 2014), increasing the minimum sample size to 610 participants. However, the distribution of nurses at the research site hospital within the nursing specialties obligated distribution of 700 surveys to cover all included nursing subspecialties.

3.4. Assessment tools

Data were collected using a set of self-report questionnaires including a socio-demographic and practice-related data sheet, the Diabetes Self-Report Tool (Drass, Muir-Nash, Boykin, Turek, & Baker, 1989) and the Diabetes Basic Knowledge Tool (Drass et al., 1989).

3.4.1. Socio-demographic and practice related data

For the purpose of this study a demographic and practice related instrument was developed. This consisted of 15 questions about gender, age, nationality, ethnicity, degree level of education, the country in which nursing qualifications were obtained, years of work experience and current work area, attendance at any diabetes education programs, access to diabetes management policies or guidelines, perceived competency in diabetes care and current provision of diabetes care.

3.4.2. The diabetes self-report tool

This questionnaire was developed by Drass et al. (1989) to assess nurses' perceived knowledge of diabetes care. It contains 15 questions addressing various diabetes-related content areas such as diabetes pathology and symptoms, medications, foot and surgical care, BGM, diet and complications. Responses use a Likert-type scale format ranging from 1 (strongly disagree) to 4 (strongly agree).

3.4.3. The diabetes basic knowledge tool

This questionnaire was also developed by Drass et al. (1989) to assess nurses' actual knowledge of diabetes care comprising 45 multiple choice-questions in five themed areas: medications, diabetes pathology/symptoms, diet, BGM, surgical and foot care. For the current study four questions were added from other validated tools - the Diabetes Survival Skill Knowledge Test (Modic et al., 2009) and the Diabetes Knowledge Questionnaire (O'Brien, Michaels, & Hardy, 2003) - to assess nurses' knowledge of diabetes complications.

3.4.4. Validity and reliability

Content validity index scores previously demonstrated for the Diabetes Knowledge Survival Skill Test, the Diabetes Knowledge Questionnaire, the Diabetes Self-Report Tool and the Diabetes Basic Knowledge Tool were 0.90, 0.68, 0.91 and 0.94, respectively (Modic et al., 2009; van Zyl & Rheeder, 2008; Yacoub et al., 2014). The most recently reported Cronbach's alpha coefficient scores demonstrating the internal

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