Diabetes knowledge for patient self-management support and education: A concurrent mixed methods study of diabetes knowledge of nurses working in a major tertiary hospital in Saudi Arabia

By

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29 July 2019
Declaration of original authorship

I certify that:

a) Except where due acknowledgement has been made, the work is that of the author alone;

b) The work has not been submitted previously, in whole or in part, to qualify for any other academic award;

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Dedication

In the name of Allah the merciful, and prayer and peace upon the best of his creatures.

I dedicate this thesis to my family whose continuous support has been my mainstay throughout the entire process. I still remember all their words of encouragement that have always helped me through any difficulties.

I dedicate this work also to all my lovely family members, who have supported me throughout my PhD studies, with all my love and appreciation.
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Abstract

**Introduction:** Diabetes Mellitus poses a growing burden globally and Saudi Arabia is no exception. Optimal health outcomes require those affected to be well-informed about the disease and its treatment to enable them to make appropriate lifestyle choices, and to adopt effective self-management strategies. Registered Nurses are at the front line of patient education and have the opportunity to determine and deliver strategies for optimal diabetes care.

**Aim:** The aim of this study was to examine nurses’ knowledge of diabetes care and its management, and to identify barriers and facilitators influencing diabetes knowledge acquisition among nurses working in a tertiary hospital in Saudi Arabia.

**Methods:** A concurrent mixed method design was used in this study. The study was comprised of two phases.

During Phase One, a cross-sectional survey was distributed to 700 nurses in a range of specialties in the Prince Sultan Medical Military City (PSMMC) in Riyadh, Saudi Arabia, with a response rate of 60.4%. Perceived and actual knowledge was assessed using the Diabetes Self-Report Tool and the Diabetes Basic Knowledge Tool.

In Phase Two, semi-structured interviews were conducted with 16 nurses from various specialties in the PSMMC. After data from the two phases were analysed individually to answer research questions specific to each phase, the results were integrated and considered in relation to Kanter’s Theory of Structural Empowerment.

**Results:** Survey results suggested that Registered Nurses in the Prince Sultan Medical Military City perceived themselves as possessing adequate knowledge to provide diabetes care and education but knowledge test scores revealed insufficiencies. In-depth
semi-structured interviews with nurses shed light on the organisational and individual barriers perceived to hinder acquisition of diabetes knowledge by these nurses. These barriers included organisational characteristics of wards and multi-disciplinary team function that served to disempower nurses in their diabetes education role. Individual-level barriers included lack of access to diabetes education and clinical experience, lack of motivation or interest. Findings highlight how nurses’ individual characteristics interacted with those of their environment in influencing the knowledge and skills they could apply in delivery of their roles.

**Conclusion:** Registered Nurses have the potential to influence the lives of many patients with diabetes. With the alarming growth in numbers of people with diabetes, nurses need to be empowered to engage patients in effective self-management. Thesis findings support development of policies and interventions to advance the diabetes knowledge and practice of frontline nurses, and strategies to empower them to apply this knowledge to promote better outcomes for people living with diabetes.
Keywords

1. Diabetes Mellitus
2. Knowledge
3. Nursing
4. Education
5. Training
6. Registered Nurse
7. Saudi Arabia
8. Prevalence
9. Incidence
10. Perceived knowledge
11. Actual knowledge
12. Barriers
13. Facilitators
14. Competency
15. Hyperglycaemia
16. Hypoglycaemia
17. Insulin
18. Perception
19. Awareness
20. Information
21. Type 1 Diabetes Mellitus
22. Type 2 Diabetes Mellitus
23. Understanding
24. Practice development
Overview of the Thesis

This thesis is presented in eight chapters. Some of these chapters are based on publications that are either in print or under consideration for publication in peer-reviewed journals.

Chapter One: This is the introduction chapter of this thesis. This chapter outlines the background, rationale and outcomes for this study along with the theoretical framework and the significance and research questions.

Chapter Two: This chapter presents an overview of peer-reviewed studies describing what is currently known of the incidence and prevalence rates of diabetes in Saudi Arabia. This chapter is based on a published paper: (Alotaibi, Gholizadeh, Perry, & Al-Ganmi, 2017b).

Chapter Three: This chapter presents a review of peer-reviewed studies examining nurses’ knowledge in relation to diabetes care and its management in different healthcare settings worldwide. This chapter is based on a published paper: (Alotaibi, Al-Ganmi, Gholizadeh, & Perry, 2016).

Chapter Four: This chapter presents the research questions, design and methods of this mixed methods study: quantitative and qualitative phases along with data integration, management and ethical considerations.

Chapter Five: This chapter presents survey results on the perceived and actual diabetes knowledge reported by nurses working in Saudi Arabia. This chapter is based on a published paper: (Alotaibi, Gholizadeh, Perry, & Al-Ganmi, 2017a).

Chapter Six: This chapter presents the findings of the qualitative phase of this study. This chapter is based on a paper accepted for publication by the Journal of Clinical
Nursing; doi: 10.1111/jocn.14544. [Epub ahead of print]

Chapter Seven: This chapter presents the overall discussion of the main results of both phases (quantitative and qualitative) of this study and wraps up the findings of this thesis in relation to its strengths and limitations.

Chapter Eight: This chapter presents the conclusions of this study, sets out the implications of this work and makes recommendations for management, clinical practice and policy, and future research.
List of Abbreviations

ADA American Diabetes Association
ADKnowl Audit of Diabetes Knowledge
ANOVA Analysis of Variance
BGM Blood Glucose Monitoring
CASP Critical Appraisal Skills Program
CCBG Casual Capillary Blood Glucose
CFBG Capillary Fasting Blood Glucose
DAS3 Diabetes Attitude Questionnaire
DBKT Diabetes Basic Knowledge Tool
DFCKS Diabetes Foot Care Knowledge Scale
DKSST Diabetes Knowledge Survival Skill Tool
DM Diabetes Mellitus
DMET Diabetes Measurement Evaluation Tool
DMKA Diabetes Management Knowledge Assessment
DSRT Diabetes Self-Report Tool
ENT Ear, Throat and Nose
ENs Enrolled Nurses
FPG Fasting Plasma Glucose
HbA1c Glycosylated haemoglobin
ICU Intensive Care Unit
KSA Kingdom of Saudi Arabia
MOH Ministry of Health
NADC National Association of Diabetes Centres
OHAs Oral Hypoglycaemia Agents
RN Registered Nurse
SCFHS The Saudi Commission for Health Specialties
T1DM Type 1 Diabetes Mellitus
T2DM Type 2 Diabetes Mellitus
UK United Kingdom
USA United States of America
Conference Papers and Publications Arising from the Thesis


Definition of Terms for this thesis

**Diabetes Mellitus:**
Diabetes mellitus is a group of metabolic disorders caused by insulin resistance and/or deficiency resulting in acute and/or chronic hyperglycaemia (American Diabetes Association, 2014)

**Staff Nurse:**
A registered nurse who works as part of the healthcare team to promote health, and to prevent and treat disease, who acts as a patient advocate, and who provides education regarding healthcare (American Nurses Association, 2016).

**Diabetes Care:**
All healthcare interventions carried out by nurses or other healthcare providers with the intention of maintaining and monitoring blood glucose within normal limits, reducing or preventing the complications of diabetes including pharmacological and non-pharmacological management methods (American Diabetes Association, 2014)

**Diabetes Knowledge:**
The understanding, awareness, familiarity and information required for healthcare providers to manage patients with diabetes to optimise blood glucose levels and reduce diabetes complications (Drass, Muir-Nash, Boykin, Turek, & Baker, 1989).