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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

NURSES' LEVEL OF COMFORT, FAMILIARITY, AND KNOWLEDGE
ABOUT DIABETES MANAGEMENT IN VINMEC CENTRAL
PARK INTERNATIONAL HOSPITAL

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science

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College of Natural and Health Sciences
School of Nursing
Advanced Nurse Generalist

December 2019

This Thesis by: Nguyen Thi Xuan Mai

Entitled: *Nurses' Level of Comfort, Familiarity, and Knowledge about Diabetes Management in Vinmec Central Park International Hospital*

Has been approved as meeting the requirement for the Degree of Master of Science in College of Natural and Health Sciences in the School of Nursing, Advanced Nurse Generalist program.

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ABSTRACT

Mai, Nguyen Thi Xuan. *Nurses' Level of Comfort, Familiarity, and Knowledge about Diabetes Management in Vinmec Central Park International Hospital*. Unpublished Master of Science thesis, University of Northern Colorado, 2019.

Clinical nurses have a key role in supporting and management of diabetes patients during hospitalization. The purpose of this study was to evaluate nurses' level of comfort, familiarity, and knowledge in diabetes management. In this study, 30 full-time nurses working in Vinmec Central Park International Hospital completed a 34-question assessment that included eight questions on comfort, six questions on familiarity, and 20 questions on nursing knowledge. The findings indicated the level of nursing knowledge regarding diabetes management in the hospital was low. The comfort, familiarity, and knowledge scores were not directly proportional to the age, education, and years of clinical experience or specialty. Finally, this study demonstrated that bedside nurses had a deficit in knowledge in the management of diabetes patients. This level of unfamiliarity indicated insufficient teaching practices. Strategies are required to provide a continuing education program for all bedside nurses and ensure all proper criteria meet the caring of specific diabetes patients. Future studies must be repeated with more data to evaluate the result of nursing and diabetes management.

Keywords: knowledge, nurse, diabetes, hyperglycemia, hypoglycemia, insulin

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CHAPTER I

INTRODUCTION

Nurses are people who spend all their time with patients and provide technical skills to care and manage symptoms during a patient's hospital stay, especially for diabetes patients who require more attention in efforts to perform nursing skills for optimal patient outcomes. Diabetic patients who are hospitalized have a multitude of needs that need to be managed such as the maintenance of their blood glucose levels through oral medications, injections, or the creation and management of a healthy and balanced diet. These measures are essential for preventing complications as well as ensuring the patient can change his/her lifestyle.

However, there is a lack of nursing knowledge regarding the daily working of patient care such as monitoring glucose levels, administering medications, and advising on nutritional conditions and lifestyle activities. Any of these factors might lead to an increase in complications and financial burdens. On the other hand, appropriate nursing training could reduce patients' hospital length-of-stay and improve blood glucose control, which helps to achieve a good outcome (American Diabetes Association [ADA], 2016).

The purpose of this study was to evaluate bedside nurses' comfort, familiarity, and knowledge in caring for diabetes patients during hospitalization. The results indicated the assessment of the readiness of nurses already working with diabetic inpatients and the findings could be used to develop a specific education program for these nurses.

Significance of Study

In Vietnam, the prevalence of diabetes has been increasing and has almost doubled in the past 10 years, which means 1 in every 20 Vietnamese adults is diabetic (World Health Organization [WHO], 2016b). The Western Pacific Region reported there were 29 million diabetic adults over 18 years of age in 1980 compared to 131 million in 2014 (WHO, 2018). Consequently, since severe complications or reasons for disability from diabetes included feet ulcers, cardiovascular diseases, kidney failures, nearly 1.5 million deaths resulted from diabetes worldwide in 2012 (WHO, 2016b).

This impact included changes in diet, lifestyle, habits, and administration of medication and monitoring of blood glucose levels. The caring of diabetic people is provided by clinical nursing specialists through their knowledge and skill (Tirosh et al., 2008). Since hospitalized diabetics require much more intensive care, much of that responsibility falls on nurses who are the closest nexus to the patient. Bedside nurses spend most of their time managing and treating diabetes patients according to a physician-ordered protocol that requires them to be knowledgeable about the most current healthcare practices (Corl, McCliment, Thompson, Suhr, & Wisse, 2014). However, nurses in Vietnam, as in other developing countries, have received little instruction regarding diabetes management in nursing or medical school, which has increased a credibility gap with patients (Baumann, Blobner, Van Binh, & Lan, 2006). On the other hand, an over-crowded hospital and lack of career development opportunities (Ng'ang'a, Woods Byrne, & Anh Ngo, 2014) have affected the development of more knowledge or skill to properly support hospitalized diabetic patients in Vietnam.

Problem Statement

According to the ADA (2018), diabetes can be classified into two types depending on insulin deficiency due to β -cell destruction (Type 1) or loss of β -cell insulin secretion based on insulin resistance (Type 2). This study focused on Type 2 diabetes as noninsulin-dependent diabetes, which is in 90-95% of all people with diabetes. Fasting plasma glucose (FPG) levels are considered to be normal range of 100 to 125mg/dL (5.6-6.9mmol/L); however, hypoglycaemia can be diagnosed within the 70mg/dL range and hyperglycemia can be diagnosed within the 180mg/dL range (Centers for Disease Control and Prevention, 2019).

One of the barriers to preventing diabetes control has been inadequate knowledge, affecting hospital treatment by increasing the length of stay in hospitals (ADA, 2014). This study attempted to identify an existing gap in scientific literature and medical practices in the Vinmec health care system in Vietnam related to comfort, familiarity, and diabetes treatment related to nursing knowledge in caring of diabetic patients during hospitalization.

Purpose of Study

Bedside nurses must be able to follow treatment protocol for diabetic patients by exhibiting professional skills that are evidence-based to be able to provide excellent care. The purpose of this research was to explore the current level of knowledge in nurses caring for diabetic patients in Vietnam concerning their level of comfort, familiarity, and diabetes-related management.

Project Objectives

The current study had several objectives. One objective was to assess the level of comfort, familiarity, and knowledge of bedside nurses in caring for diabetes patients.

The other two objectives were to identify the possible relationships among age, years of experience, and level of comfort, familiarity, and knowledge in the management of diabetic patients; and to establish relationships that might exist among nurses' levels of comfort, familiarity, and knowledge about diabetes management.

Research Questions

- Q1 What is nurses' level of comfort, familiarity and knowledge about diabetes management?
- Q2 What are the relationships among age, years of experience, and level of comfort, familiarity, and knowledge about diabetes management?
- Q3 What are the relationships among nurses' level of comfort, familiarity, and knowledge about diabetes management?

Theoretical Framework

According to Patricia Benner (1982). "The complexity and responsibility of nursing practice today requires long-term and ongoing career development. This, in turn, requires an understanding of the differences between the experienced nurse and the novice" (p. 402). Her model of skill acquisition was based on a tool in the chain of clinical nursing practice with five levels of proficiency: novice, advanced beginner, competent, proficient, and expert. This study used Benner's theory—from novice to expert—as the theoretical framework that could be applied for training nurses in clinical practice and was based on the knowledge acquired through teaching and learning for the development of experiences working as the requirement of nursing skills at an appropriate level.

- Benner (1982) found rules must be taught to *novices* in order to guide their actions in different practices including simple activities such as monitoring fluid intake and output, checking vital signs, etc. The main difficulty for a beginner was facing a real situation that needed to use context-free rules for guiding task performance.
- *Advanced beginners* practice in real situations that are concerned with perfecting patient care procedures or thoroughly learning appropriate guidelines for solving situations requiring nursing experience and knowledge gained through the mentorship and experience of the next stratum—competent nurse (Benner, 1982).
- Benner (1982) stated, “A nursing plan is based on considerable conscious, abstract, analytic contemplation of the problem” (p. 404); *competent* nurses acquire the ability to manage a variety of clinical nursing situations through the application of standards and modified plans in response to different situations.
- The competent nurse moves to the *proficient* stage with continued practice and develops nursing skills that could modify plans in response to circumstances, recognize some problems, and make decisions through their experiences in atypical events (Benner, 1982).
- Benner (1982) described the *expert* level as “the performer who no longer relies on an analytical principle (rule, guideline, maxim) to connect her/his understanding of the situation to an appropriate action” (p. 405); the expert nurse uses a large of previous experience for solving all of the problems

without wasted compensation by a deep understanding of real situations and performance of the right action in his/her healthcare practice.

Definition of Terms

Advanced beginners. People practice in real situations followed by time and experience learning from previous tasks (Benner, 1982).

Comfort. A feeling of confidence for using knowledge in skills performance (Modic et al., 2014).

Competent. Experience and knowledge performed during working time with goal of plan (Benner, 1982).

Diabetes. A chronic disease that happens when the pancreas does not produce enough insulin or when the body cannot use the insulin it produces. Insulin is a hormone that controls blood sugar (WHO, 2016a).

Expert. A goal of skill acquisition (Benner, 1982).

Familiarity. Knowledge within the dominion of a skill measurement (Modic et al., 2014).

Hyperglycaemia. High blood sugar (WHO, 2016a).

Hypoglycaemia. Low blood sugar (WHO, 2016a).

Knowledge. Theoretical or practical understanding of an issue (Haynes, 2016).

Novices or beginners. People who perform tasks with inexperience in any situation (Benner, 1982).

Proficient. Development of his/her performance for nearly any situation he/she might encounter in continued practice (Benner, 1982).

Summary

Nowadays, the responsibility of nursing practice is more complex and requires long-term and continued professional development. The improvement of nursing quality from beginner to expert level would establish more comfort, familiarity, and knowledge for the care of the patient. Also, when nurses understand more about diabetes management, the result would be an increase in better outcomes for the hospitalized patient.

CHAPTER II

LITERATURE REVIEW

This literature review searched relevant articles that focused on the purpose of research and were published within the last five years. This chapter introduces a review of literature associated with performing the level of comfort, familiarity, and knowledge of bedside nurses regarding diabetes management skills when caring for hospitalized diabetic patients.

Development of Research Plan

A systematic search strategy was started by identifying literature that related to knowledge that exists in nursing, specifically diabetic patients. The literature on this topic was researched through the use of databases such as Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline via EBSCO host, COCHRANE, and PUBMED. Keywords or medical subjects related to heading terms (MeSH) such as “knowledge,” “perception,” “nurse,” “diabetes,” “hyperglycaemia,” “hypoglycaemia,” and “insulin” were used as well as truncated words and wildcards to search multiple spelling terms such as “nurs* knowledge,” “nurs* perception,” “diabet*,” “hyperglyc*,” and “hypoglyc*.” Boolean operators (AND, OR) were also combined as components in the the search terms.

Scan 1 showed 105,812 studies were retrieved using “nurs* knowledge” or “nurs* perception” and 1,438,246 studies were retrieved using “diabetes” or “hyperglycaemia” or “hypoglycaemia” or “insulin.” These databases continued to search for articles

published from January 2014 to December 2018 in English and peer-reviewed journals; the search strategies focused on 63 citations of potential relevance (Scan 2; see Table 1).

Table 1

Search Terms and Results

Scans	CINAHL	COCHRANE	MEDLINE	PUBMED
Scan 1	13,169	1	1,177	91,465
Scan 2	232,749	631	217,099	977,867
Scans 1 and 2 with limits: date (2014-2018), peer review, adult, journal article, and English language	5	0	24	26

Continued screening of study titles and abstracts revealed 92% of them did not meet review criteria. Due to the limited amount of research related to nursing level of comfort, familiarity, and knowledge for diabetes patients during hospitalization, only five studies were retained for evaluation. Two studies found a lack of nursing education related to hyperglycemia or hypoglycemia (Hargraves, 2014; Sampayo & Tofthagen, 2017), two studies identified nurses' need to receive specific training for diabetes management in hospitals (Alotaibi, Gholizadeh, Al-Ganmi, & Perry, 2018; Yacoub et al., 2015), but only one research examined a nurse's knowledge level of comfort, familiarity, and knowledge of diabetes management (Modic et al., 2014). Modic et al. (2014) performed a descriptive study regarding nursing level of comfort, familiarity, and knowledge in bedside caring diabetes patients. This survey involved 2,250 new nurses at a healthcare center in the Midwest with 1,200 beds using the Diabetes Management

Knowledge Assessment Tool (DMKAT; Modic et al., 2014) to measure nurses' knowledge of hyperglycemia and hypoglycemia management that focused on diabetes survival. The results found the level of nursing knowledge regarding diabetes management was not correlated with scores of age or experience; nor was the level of nursing knowledge correlated with comfort or familiarity.

Limitations of Literature

Obstacles addressed in the literature were related to nursing knowledge and performance of good skills in caring for diabetic patients. Barriers identified through the healthcare setting and working activities of nurses included lack of knowledge about management of diabetes (Modic et al., 2014; Sampayo & Tofthagen, 2017) and factors that affected nurses' acquisition of diabetes knowledge through relevant educational resources (Alotaibi et al., 2018). Education program was also identified as a main point that increased nurses' level of perceived and actual knowledge regarding diabetes care (Yacoub et al., 2015). Hargraves (2014) evaluated nurses' management of glycemia before and after education by following an insulin protocol in surgery patients.

Knowledge Deficits

Diabetes has been diagnosed in hospitals due to different symptoms. Thus, nurses must have the necessary knowledge for approaching diabetic patients. Continuing education programs for nurses could improve a specific of nursing skills and knowledge for diabetes management through nurses' self-assessment in diabetes cases (Chang & Zang, 2017). This research study addressed the discomfort most nurses felt concerning administering diabetes medication and the emergency management of diabetic patients.

It also demonstrated nurses' comfort level of caring for diabetic patients could be improved through education

Summary

In Vietnam, the prevalence of diabetes has almost doubled with 1 in every 20 adults and tripled with pre-diabetics within the past 10 years (WHO, 2018). The burden of diabetes has not only been measured by current treatment costs but also by projected expenditures caused by complications resulting from diabetes or even disability or death resulting from cardiovascular diseases, blindness, kidney failures, etc. (WHO, 2016b).

Hence, responsibility rests with medical staff to provide education to patients with chronic diseases such as diabetes that includes instruction for daily patient practice. In addition, the continuation of nursing training is an essential part of improving nurses' level of readiness to deliver quality care.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study was to evaluate the level of knowledge, comfort, and familiarity of nurses caring for diabetes patients during hospitalization. The results of this study could identify a gap in nursing knowledge regarding diabetes management and improve nursing skills through teaching and learning.

Research Design

A descriptive research design was used in this study to investigate the comfort, familiarity, and knowledge level of nurses in diabetes management. A demographic questionnaire and the DMKAT (Modic et al., 2014) was administered to 30 nurses who work full-time in Vinmec Central Park International Hospital.

Setting

This study was conducted at the Vinmec Central Park International Hospital (2018), which is one of the seven general hospitals of Vinmec healthcare system located in Ho Chi Minh City in the southeast part of Viet Nam. This hospital was opened in 2015 with 150 beds and 205 nurses, midwives, and technicians caring for about 102,776 outpatients and 5,939 inpatients of which an estimated 10% of patients required hospitalization for diabetes or reasons related to diabetes (Vinmec Central Park International Hospital, 2018). The emergency department (10 beds) and an intensive care unit (ICU, nine beds) receive diabetic patients for acute care and critical care before

transferring them to the medical department (24 beds). The outpatient department usually examines patient for primary conditions other than diabetes before moving them to central departments for treatment in the cardiology, surgical, and oncology departments.

Research Sample

The participant sample included nurses who cared for hospitalized diabetic patients. These nurses were working in intensive care, emergency, cardiology, surgery, or medicine departments; it was hoped at least 30 nurses would participate in this study. The participants were licensed, had full-time status, and cared for diabetic patients as bedside nurses.

Protection of Human Subjects

This research was approved by the Institutional Review Board of the University of Northern Colorado after receiving an approval letter from the Vinmec Central Park International Hospital (see Appendix A). A consent form was provided to each participant with the agreement that the study would not pose a risk to them as the survey was anonymous, voluntary, and confidential (see Appendix B). All records were destroyed after the session was finished. The demographic and DMKAT multichoice questionnaires were delivered online (see Appendix C); each participant was required to use a personal username and password to enter and answer this survey. The surveys were then returned to the investigator.

Study Instrument

The DMKAT (Modic et al., 2014) was used for this survey. This tool was developed by Mary Beth Modic who worked at the Nursing Institute of the Cleveland

Clinic in Cleveland, Ohio (see Appendix D for permission to use instrument). The DMKAT is separated into five sections: demographics, self- assessment, self- assessment of comfort, self- assessment of familiarity, and knowledge of diabetes. The demographics section included some questions to identify the sample. The self-evaluation section (two questions) focused on nursing skills and expertise in taking care of diabetic patients and asked participants to answer on a 10-point scale ranging from 1 = *Poor* to 10 = *Exceptional*. The self-assessment of comfort section contained eight questions to address the nurses' level of comfort in diabetes management. Responses on a 10-point scale ranged from 1 = *Very uncomfortable* to 10 = *Very comfortable* for a possible total of 80 points. The self-assessment of familiarity section focused on six questions about hospital policies for evaluating nursing knowledge of diabetes. Responses on a 10-point scale ranged from 1 = *Very unfamiliar* to 10 = *Very familiar* for a possible total of 60 points. Twenty multiple-choice questions assessed the knowledge of bedside nurses regarding specific diabetes care such as the management of hyper- and hypoglycaemia, using insulin, and patient' s education for identifying critical diabetes situations. Each right answer received one point for a possible total score of 20 points, showing higher diabetes knowledge.

Plan for Data Collection

Nurses working in an intensive care unit (ICU), emergency, cardiology, surgery, and medicine departments were invited to participate in a nurse meeting at the end of April 2019. A hard copy of the consent form was delivered to participants for signing before the performance of the survey. The demographic and DMKAT (Modic et al.,

2014) multichoice questions were delivered to participants online, which was secured by a personal password for each user.

Data Analysis

The researcher had one week to collect the surveys from the participants. All data collected were in the aggregate and summarized in an Excel table before using the Statistical Package for Social Sciences (SPSS) for analysis.

CHAPTER IV

DATA ANALYSIS AND RESULTS

The findings of this research are presented in the following sections. The first section is a brief description of the demographic data of the study sample. The second section addresses the self-assessment of overall teaching skills and knowledge about diabetes management in the hospital. The third section contains eight statements to assess the comfort level of nurses regarding diabetes management in the hospital. The fourth section presents a series of reports that determined the familiarity of the nurses with hospital policies and resources regarding diabetes management. The fifth section provides the 20 test questions that evaluated the nurses' knowledge about the care of diabetic in-patients.

Description of the Sample

The sample included 30 nurses who worked at Vinmec Central Park International Hospital. Demographic data about the study participants covered in this section included factors such as age, years of nursing experience, gender, education, care specialty, attendance at in-services, number of patients with diabetes cared for on a weekly basis, how competent the nurses felt, and perceived obstacles to the management of blood glucose in the hospital (see Table 2).

Table 2

Description of the Sample

Characteristic	<i>N</i>	<i>M</i>	Minimum	Maximum
Age	30	33.00	24.00	47
Years of Nursing Experience	30	10.43	1.50	25
Characteristic	<i>N</i>	<i>n</i>	%	
Gender	30			
Male		8	26.7	
Female		22	73.3	
Education	30			
ASN		4	13.3	
Diploma		6	20.0	
BSN		18	60.0	
MSN		2	6.7	
Specialty	30			
Cardiology		9	30.0	
ICU		7	23.3	
Medical		6	20.0	
Emergency		4	13.3	
Surgical		2	6.7	
Oncology		2	6.7	
Attendance at in services/continuing education in which diabetes was the focus	30			
- None		21	70.0	
- Within the last 6 months		4	13.3	
- More than 6 months but less than 1 year ago		2	6.7	
- More than 1 year ago but less than 2 years ago		2	6.7	
- More than 2 years ago		1	3.3	
Number of patients with diabetes you care for on a weekly basis	30			
None		7	23.3	
<2		17	56.7	
2- 5		5	16.7	
2-10		1	3.3	
>10		0	0.0	
How competent do the nurses feel in caring for a patient with diabetes? On a scale from 0 to 10:	30			
2		1	3.3	
5		8	26.7	
6		6	20.0	
7		7	23.3	
8		7	23.3	
9		1	3.3	
Greatest obstacle to managing blood glucose in hospital	30			
Ineffective insulin regimen		3	10.0	
Unclear glucose targets		3	10.0	
Lack of coordination between blood glucose monitoring		18	60.0	
Unfamiliar with hospital policies		1	3.3	
Other (failure to follow a diet)		2	6.7	
Handoff communication		1	3.3	
Personal knowledge deficit		2	6.7	

Self-Assessment

Overall Teaching Skills and Knowledge

In this section, the 30 study respondents were asked to assess their overall teaching skills and knowledge about diabetes management in the hospital. On a scale of 0 = *Poor* to 10 = *Exceptional*, a majority of nurses rated their overall teaching skills and knowledge (instructing patients about managing symptoms, taking medications correctly, when to notify their physician, blood glucose monitoring, etc.) as 5 and above ($n = 29$, 96.7%). On a scale of 0 = *Poor* to 10 = *Exceptional*, 27 (90.1%) nurses in this study rated their over-all knowledge of diabetes management (knowledge and side effects of glucose-lowering agents, action and duration of different insulin's, managing of high and low blood sugars, lifestyle modifications, etc.) as 5 and above.

Overall Comfort with Diabetes Management

In this section, study respondents were asked to assess their overall comfort with diabetes management in the hospital. On a scale of 0 = *Poor* to 10 = *Feeling comfortable*, nurses rated their general level of comfort in administering subcutaneous and intravenous insulin, in managing hyper and hypoglycemia, teaching patients how to prevent and manage low blood sugars at home, and educating patients for blood glucose monitoring (BGM). A majority of the nurses responded their level of comfort for each of these areas was primarily rated at a 5 or above (see Table 3).

Table 3

Overall Level of Comfort

Statements	<i>M</i>	<i>SD</i>
1. Administering subcutaneous insulin	8.13	1.38
2. In teaching patients about insulin administration	7.37	1.07
3. Administering IV insulin infusions	7.33	1.52
4. Caring for patients with insulin pumps.	7.80	2.00
5. Comfort in managing hyperglycemia	6.60	1.62
6. Comfort in managing hypoglycemia	6.30	1.42
7. Comfort in teaching patients how to prevent and manage low blood sugars at home	7.77	1.81
8. Comfort in teaching patients about blood glucose monitoring	7.20	1.69

N = 30

Familiarity with Hospital Policies and Resources

In this section, study respondents were asked to assess their familiarity with hospital policies and resources regarding diabetes management on a scale of 0 = *Very unfamiliar* to 10 = *Very familiar*. A majority of the nurses responded their level of familiarity for each of these areas was primarily rated at a 5 or above (see Table 4).

Table 4

Familiarity with Hospital Policies and Resources

Statements	<i>M</i>	<i>SD</i>
9. Familiarity with diabetes management policy	6.57	1.45
10. Familiarity with hypoglycemia prevention and management policy	7.90	1.56
11. Familiarity with insulin intravenous admin on non-ICU	7.40	1.65
12. Familiarity with ICU intravenous admin policy	6.00	2.41
13. Familiarity with insulin pump policy (patient's own medical device)	6.60	2.33
14. General level of familiarity with available resources for teaching patients	7.33	1.56

N = 30

Diabetes Knowledge

Twenty multiple choice questions assessing diabetes knowledge of nurses in the care of diabetic in-patients were included with the DMKAT (Modic et al., 2014) survey. These results provided the foundation for on-going nursing education programs specifically targeting nurses who care for in-patients with type I and II diabetes. As an aggregate, data from this “test of knowledge” demonstrated an overall lack of knowledge on the nurses’ part regarding the care of in-patients with a type I or type II diabetes (see Table 5 for detailed information).

Table 5

Diabetes Knowledge

Question	<i>n</i>	%
1. Infections may be more difficult to treat during hyperglycemia because...		
Correct	18	60.0
Incorrect	12	40.0
2. Neutrophil impairment begins to take place at what glucose level...		
Correct	9	26.7
Incorrect	22	73.3
3. Glargine (Lantus) is...		
Correct	17	56.7
Incorrect	13	43.3
4. Diabetes Survival Skill Education		
Correct	19	63.3
Incorrect	11	36.7
5. Treatment for hypoglycemia		
Correct	20	66.7
Incorrect	10	33.3
6. When converting from a continuous IV insulin infusion to subcutaneous insulin		
Correct	14	46.7
Incorrect	16	53.5
7. Basal insulin		
Correct	8	26.7
Incorrect	22	73.3
8. Patients with an illness		
Correct	26	86.7
Incorrect	4	13.3
9. Explain hypoglycemia unawareness		
Correct	9	30.0
Incorrect	21	70.0
10. Glucagon admin at home		
Correct	7	23.3
Incorrect	23	76.7
11. BEST nursing intervention to prevent hyperglycemia		
Correct	12	40.0
Incorrect	18	60.0

Table 5 continued

Question	<i>n</i>	%
12. Disposal of sharp medical waste		
Correct	28	93.3
Incorrect	2	6.7
13. Most appropriate treatment for mild hypoglycemia in a conscious patient		
Correct	9	30.0
Incorrect	21	70.0
14. Preferred method of treating DKA or HHS		
Correct	8	26.7
Incorrect	22	73.3
15. Clarification of insulin orders		
Correct	6	20.0
Incorrect	24	80.0
16. Type 2 diabetics and self-blood glucose monitoring		
Correct	19	63.3
Incorrect	11	36.7
17. Treatment for blood glucose rises		
Correct	12	40.0
Incorrect	18	60.0
18. Contributing factors for hyperglycemia		
Correct	7	23.3
Incorrect	23	76.7
19. Patients and physician notifications		
Correct	0	0.0
Incorrect	30	100.0
20. Recognizing when adjustments are need to insulin based on blood glucose levels		
Correct	17	56.7
Incorrect	13	43.3

N = 30

Summary of Associations

To explore the association among the demographics, comfort, familiarity, and knowledge in the management of in-patients with type I and type II diabetes, a Pearson correlation coefficient was calculated (*N* = 30). Two-tailed tests with significance set at .05 and .01 levels were used for all calculations. The variables were assessed for

relationships among age, years of nursing experience, gender, education, specialty, attendance at in-services or continuing education in diabetes that focused about number of diabetes patients cared for by nurses on a weekly basis, level of nurses' competence in caring for patients with diabetes, self-perceived teaching skill when instructing patients about diabetes, and nursing knowledge of diabetes management.

Statistically significant associations were found (a) between the education level of the nurse for continuing education where diabetes was the focus ($r = .431, p < .05$), (b) between \ nurse specialty area and the level of competence the nurse felt in caring for a patient with diabetes ($r = -.471, p < .01$), and (c) the number of patients with diabetes cared for each week and the perceived level of competence in caring for a patient with diabetes ($r = .535, p < .01$). All other associations were not significantly correlated.

CHAPTER V

DISCUSSION

The purpose of this study was to assess the level of comfort, familiarity, and knowledge of nurses already caring for in-patient diabetic patients. Specific objectives were to (a) evaluate the level of comfort, familiarity, and knowledge of bedside nurses in caring for diabetic patients; (b) identify a possible relationship among age, years of experience, and level of comfort, familiarity, and knowledge in the management of diabetic patients; and (c) identify relationships that might exist among nurses' level of comfort, familiarity, and knowledge about diabetes management. In this chapter, major findings and conclusions are presented followed by a brief discussion of the sample and setting characteristics. Discussion regarding the strengths and limitations of the study, measurement issues, implications for practice, and recommendations for future research conclude this chapter.

Sample Characteristics

This study assessed nurses' comfort, familiarity, and knowledge level in caring for diabetic patients during their hospitalization at Vinmec Central Park International Hospital. Thirty nurses with varying qualifications participated across two questionnaires related to nurses' comfort, familiarity, and knowledge of diabetes. The majority of nurses in this study were female (73.3%) and all worked full-time. The mean age of nurses in this study was 33 and the mean years of work experience were 10.43 (from 1.5 to 25 years). Nurses in this survey had varying degrees of education and training: four

nurses held an Associate of Science in Nursing, six nurses held a Diploma in Nursing, 18 nurses held a Bachelor of Science in Nursing (BSN), and two nurses held a Master of Science in Nursing (MSN). Of these participants, 70% had not participated in continuing diabetes education, 13.3% had received diabetes education within the last six months, 6.7% had attended continuing diabetes education more than six months but less than one year ago, 6.7% had received diabetes education more than one year but less than two years ago, and 3.3% had received diabetes education more than two years ago. The self-perceived competence level of nurses to care for diabetes patients received a high score (7-8) by 14 nurses (46.6%), which related to nurses with more education and experience. The greatest obstacle to managing blood glucose in the hospital was the lack of knowledge on the nurse's part regarding BGM as 18 (60%) nurses provided incorrect answers to questions about BGM.

Setting Characteristics

This study was conducted at the Vinmec Central Park International Hospital located in Ho Chi Minh City in southern Vietnam. This hospital provides services for outpatient and inpatient care including intensive care, emergency, cardiology, pediatric, obstetrics and gynecology, surgery, and medicine departments. This facility consists of two diabetes doctors and one dietician who are available to treat and educate staff and patients with diabetes. Data collected in this research could promote nursing education regarding time spent caring for patients with diabetes.

Major Findings

This was the first study in the Vinmec healthcare system for finding a gap in comfort, familiarity, and knowledge levels from bedside nurses in the management of

diabetic patients in diabetes treatment. As shown in Table 2, 22 (73.4%) of the nurses scored a 7 or below on a scale of 1 to 10 on how competent they felt in caring for a patient with diabetes. Additionally, 18 (60%) nurses indicated the greatest obstacle to managing blood glucose in the hospital was the lack of coordination among BGM, insulin administration and meal delivery. In addition, the rate of overall teaching showed night nurses (30%) and eight nurses (26.65%) performed their knowledge of diabetes management at a score of 8.

The results of nurses' self-assessment of their level of comfort with the management of hospitalized diabetic patients demonstrated a decreased level of comfort in all areas of caring. Nurses in this study indicated their level of comfort to be approximately 8 and below (on a scale of 0-10) for all items. Of note, the nurses indicated their lowest level of comfort was in the management of hypoglycemia ($M = 6.30$; $SD = 1.42$). General level of comfort and knowledge in managing hypoglycemia is essential in the care of hospitalized patients with diabetes.

Only 20% to 56.7% of nurses felt familiar with diabetes management policies including hypoglycaemia prevention, insulin injection, and teaching patients (as reflected by a score of 8). This result showed the level of nurses' unfamiliarity when caring for diabetic patients in a clinical setting.

In this study, the DMKAT (Modic et al., 2014) was used for nursing assessment with the highest score of 100 reflecting more excellent knowledge. The result of this study found there were knowledge deficiencies of bedside nurses regarding multi-core aspects of caring for diabetes patients. Table 5 showed 70% of multiple choice questions were answered incorrectly by more than 50% of participants related to insulin therapy,

prevention and treatment of hypoglycaemia or hyperglycaemia, nutrition, BGM, diabetes complications, etc.

Hollis, Glaster, and Lapsley (2014) stated nurses as healthcare providers need to be trained with appropriate knowledge and practice in their position of caring and education of diabetes patients. The results of this study confirmed diabetes education for bedside nurses must be conducted in the near future.

Strengths and Limitations of the Study

The strengths of this study included (a) the significant amount of baseline information available to create and establish specific in-services/continuing education offerings specifically to address the care of the in-patient diabetic patients and also (b) the ability to address deficits found in nurses' baseline knowledge and comfort levels in the care of in-patients with diabetes. An additional strength of this study was the vast amount of baseline information available to continue this study at other area hospitals in Vietnam.

Several factors might have limited the generalizability of the findings of this study. This was an exploratory, non-experimental study that included a small sample of participants, which could have led to preventing generalization of the findings. Once in-service/continuing education programs are established, experimental studies could be conducted to further foster nurse comfort and knowledge in the care of in-patients with diabetes.

Implications for Practice

The findings of this study could furnish a foundation in providing an in-service/continuing education program for nurses that specifically addresses the care of in-patients

with diabetes. Findings in this study could lead to improving nursing knowledge and skills through the development of more factors that build the attitudes and beliefs of nurses in providing the best care to diabetic patients (Alotaibi, Al-Ganmi, Gholizadeh, & Perry, 2016). Conversely, nursing shortages might prevent diabetes education of nurses in the form of attending training opportunities such as external conferences (Scheppers, van Dongen, Dekker, Geertzen, & Dekker, 2006). Diabetes education programs must be enacted to improve nurses' comprehensive knowledge and these programs must be supported in the hospital setting so new nurses can overcome acquisition barriers.

Recommendations for Research

This study addressed a gap in improving nursing knowledge and skills of bedside nurses in managing diabetes in Vinmec Central Park International Hospital. A future action would be to collaborate with diabetes educators in the development of diabetes education programs for new nurses and for nurses already working in hospitals. This could be a means of providing nurses with quality care for diabetic patients. Continued learning programs must be provided to ensure the best education and reduce the risk of diabetes complications. This study was meant to increase awareness of the need for up-to-date nursing knowledge and readiness to practice in the management of diabetic patients by improving the current education of nurses.

Conclusion

In Vietnam, the number of pre-diabetic people has increased to three times the number of people with diabetes. It estimated 53,458 deaths were related to diabetes in Vietnam (WHO, 2016a) due to severe complications common to the diabetic condition: feet ulcers, cardiovascular diseases, blindness, kidney failure, etc. This study considered

the prevalence of global diabetes and the critical role of nurses in caring for diabetes patients (Burke, Sherr, & Lipman, 2014). The lack of continuing education or training on diabetes care, shortage of nurses, extended workloads, etc. were addressed as barriers to improving nursing knowledge.

It is important that all bedside nurses are ready to manage diabetes patients through their knowledge and practice, which could be provided through specific continuing education programs. This study provided rich data about the comfort and knowledge levels of nurses who care for in-patients with diabetes.

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APPENDIX A

**APPROVALS FROM UNIVERSITY OF NORTHERN
COLORADO INSTITUTIONAL REVIEW BOARD
AND VINMEC CENTRAL PARK
INTERNATIONAL HOSPITAL**



Institutional Review Board

DATE: April 29, 2019

TO: mai nguyen
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1429080-1] Nurses' Level of Comfort, Familiarity and Knowledge About Diabetes Management

SUBMISSION TYPE: New Project

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS

DECISION DATE: April 29, 2019

EXPIRATION DATE: April 29, 2023

Thank you for your submission of New Project materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

Mai -

Thank you for a clear and thorough IRB application. These materials and protocols are verified/ approved exempt and you may proceed with participant recruitment and data collection.

Best wishes with your research.

Sincerely,

Dr. Megan Stellino, UNC IRB Co-Chair

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or nicole.morse@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.



Institutional Review Board

DATE: April 29, 2019

TO: mai nguyen
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1429080-1] Nurses' Level of Comfort, Familiarity and Knowledge About Diabetes Management

SUBMISSION TYPE: New Project

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS

DECISION DATE: April 29, 2019

EXPIRATION DATE: April 29, 2023

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Mai -

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Best wishes with your research.

Sincerely,

Dr. Megan Stellino, UNC IRB Co-Chair

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or nicole.morse@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.



Letter of Agreement

March 1, 2019

To: Director of Vinmec Central Park Hospital.

My name is Nguyen Thi Xuan Mai, I am Nurse Manager in Out Patient Department of Vinmec Central Park Hospital. As knowing that the Vinmec hospital allowed nurses to element a research that help to improve nursing education and quality of care for patient.

For my Capstone Project, "Nurses' Level of Comfort, Familiarity and Knowledge about Diabetes Management", I am planning to assess a competent nursing through of the survey with 20 question multiple choice test of general diabetes knowledge. The results of research may develop training program for nurses in Vinmec health care system in Viet Nam

I understand that this research will be following ethical principles which remains on voluntary and confidential participations.

I am requesting of your agreement in my research

And I look forward to hearing from you.

Respectfully

A handwritten signature in black ink, appearing to read "Xuan Mai", is written over a light green decorative graphic element.

Nguyễn Thị Xuân Mai
Nurse Manager

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[A] 208 Nguyen Huu Canh street,
Ward 22, Binh Thanh dist, HCM City



Letter of Approval

March 4, 2019

Dear Ms. Nguyen Thi Xuan Mai,

Your Capstone Project, "Nurse' level of Comfort, Familiarity and Knowledge about Diabetes Management", was approved as a first stage of study on March 4, 2019.

Please, provide further information of study for final assessment

If any changes of research's plan that related to human subject or ethic principle, the new research must be submitted for approval.

Sincerely,

A handwritten signature in black ink is positioned to the left of a red circular stamp. The stamp contains the Vinmec logo (a stylized bird) and the text "HỘI Y KHOA QUỐC TẾ VINMEC CENTRAL BUILDING" around the top edge and "CÔNG TY CỔ PHẦN BỆNH VIỆN QUỐC TẾ VINMEC" around the bottom edge. In the center of the stamp, it says "NSCHI: 0106052554-001".

MD. PhD. Truong Ngoc Hai
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[M] (+84 9) 3333 6688
[E] v.haitn2@vinmec.com
[A] 208 Nguyen Huu Canh street,
Ward 22, Binh Thanh dist, HCM City



Thư xin phép

Ngày 1 tháng 3 năm 2019

Kính gửi: Giám đốc bệnh viện Vinmec Central Park.

Tôi tên là Nguyen Thi Xuan Mai, là điều dưỡng trưởng khoa khám, bệnh viện Vinmec Central Park. Nhằm mục đích nâng cao chất lượng chăm sóc bệnh nhân, tôi xin thực hiện đề tài nghiên cứu về giáo dục điều dưỡng tại bệnh viện.

Đề tài dự kiến của tôi là, “Mức Độ Thoái Mái, Thân Thuộc và Kiến Thức của Điều Dưỡng về Quản Lý Đái Tháo Đường”. Kế hoạch đánh giá năng lực điều dưỡng của tôi, được thực hiện qua khảo sát 20 câu hỏi trắc nghiệm tổng quan kiến thức Đái Tháo Đường. Kết quả của nghiên cứu này có thể giúp phát triển việc đào tạo điều dưỡng cho hệ thống y tế Vinmec.

Tôi cam kết thực hiện nghiên cứu này theo quy định về y đức, tự nguyện và đảm bảo quyền riêng tư đối với người tham gia.

Kính mong nhận được ý kiến của Ban Giám đốc bệnh viện,

Cho tôi thực hiện nghiên cứu này.

Tôi thành thật cảm ơn

A handwritten signature in black ink, appearing to read "Xuan Mai", is written over a light green decorative graphic element.

Nguyễn Thị Xuân Mai

Điều dưỡng trưởng khoa khám

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P. 22, Q. Bình Thạnh, TP. HCM



Thư đồng ý

Ngày 4 tháng 3 năm 2019

Thân gửi chị Nguyễn Thị Xuân Mai,

Đề tài dự kiến của chị là “Mức Độ Thoải Mái, Thân Thuộc và Kiến Thức của Điều Dưỡng về Quản Lý Đái Tháo Đường, được phê duyệt vào ngày 4 tháng 3 năm 2019, đồng ý cho thực hiện giai đoạn đầu tiên.

Vui lòng cung cấp đầy đủ thông tin, để đánh giá toàn bộ đề tài.

Nếu có sự thay đổi kế hoạch nghiên cứu, liên quan đến y đức và quyền con người, cần gửi phê duyệt lại nội dung của đề tài mới.

Xin cảm ơn



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APPENDIX B

**NO SIGNATURE INFORMED CONSENT IN ENGLISH
AND VIETNAMESE**



INFORMED CONSENT-NO SIGNATURE DOCUMENT

Project Title: Nurses' Level of Comfort, Familiarity and Knowledge about Diabetes Management

Student Researcher: Nguyen Thi Xuan Mai

Research Advisor: Kathleen N. Dunem PhD, APRN, CNM, School of Nursing

Purpose: The purpose of this project is to audits the level of comfort, familiarity and knowledge of nurses who are already to care diabetes patients in hospitalization

Objective: This project sets to

- Assess level of comfort, familiarity and knowledge of bedside nurses in caring for diabetes patients.
- Identify the possible relationships between age, experience, years and level of comfort, familiarity and knowledge in the management of diabetic patients.
- Identify relationships that may exist between nurses' level of comfort and familiarity and knowledge about diabetes management.

All responses will be kept confidential and anonymous. All questionnaires will be scanned into a password protected computer and then "shredded" (permanently destroyed). All study data and information will then be kept on a thumb drive in a locked drawer in a locked cabinet. There are no anticipated risks by participation in this survey. If you complete the survey, it will be assumed that you have communicated consent for your participation. You may keep this form for future reference.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled.

Having read the above and having had an opportunity to ask any questions, please sign below if you would like to participate in this research. A copy of this form will be given to you to retain for future reference. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

Please give this informed consent and the completed questionnaire to the researcher (the one who gave you the form).

Committee Contact information:

Student Researcher: Nguyen Thi Xuan Mai, Master's -student

Email: nguy5907@bears.unco.edu or xmai6767@gmail.com

Phone: (84 8) 0909971571

Research Advisor: Kathleen N. Dunemn, PhD, APRN, CNM, School of Nursing

Email: Kathleen.dunemn@unco.edu

Phone: (803)409-8391/ (303)325-5295

Participant

Questionnaire Number Assigned _____

Print Name _____

Sign Name _____



THÔNG TIN ĐỒNG Ý- KÝ TÊN KHI ĐỒNG Ý THỰC HIỆN

Tên đề tài: Mức Độ Thoải Mái, Thân Thuộc và Kiến Thức của Điều dưỡng về Quản lý Bệnh Đái Tháo Đường.

Student Researcher: Nguyen Thi Xuan Mai

Research Advisor: Kathleen N. Dunem PhD, APRN, CNM, School of Nursing

Mục đích: Mục đích của đề tài này nhằm khảo sát mức độ thoải mái, thân thuộc và kiến thức của điều dưỡng sẵn sàng chăm sóc cho người bệnh đái tháo đường nằm viện.

Mục tiêu: Đề tài được xây dựng để

- Đánh giá mức độ thoải mái, thân thuộc và kiến thức của điều dưỡng chăm sóc cho người bệnh đái tháo đường nằm viện.
- Xác định các mối quan hệ có thể có giữa tuổi tác, kinh nghiệm, năm làm việc và mức độ thoải mái, thân thuộc và kiến thức của điều dưỡng chăm sóc cho người bệnh đái tháo đường
- Xác định các mối quan hệ có thể tồn tại giữa mức độ thoải mái, thân thuộc và kiến thức của điều dưỡng chăm sóc cho người bệnh đái tháo đường

Tất cả các câu trả lời sẽ được giữ bí mật và ẩn danh. Tất cả các câu hỏi sẽ được quét vào máy tính được bảo vệ bằng mật khẩu và sau đó bị cắt vụn (hủy vĩnh viễn). Tất cả dữ liệu và thông tin nghiên cứu sẽ được lưu giữ trên ổ đĩa được cất vào ngăn kéo trong tủ có khóa. Không có rủi ro nào dự đoán cho việc tham gia khảo sát này. Nếu bạn hoàn thành khảo sát, được xem như là bạn đồng ý tham gia. Bạn có thể giữ lại mẫu thông tin này để tham khảo cho tương lai.

Việc tham gia là tự nguyện. Bạn có thể quyết định không tham gia nghiên cứu này và nếu bạn bắt đầu tham gia, bạn vẫn có thể dừng và rời đi vào bất cứ thời điểm nào. Sự quyết định của bạn luôn được tôn trọng và không ảnh hưởng đến quyền lợi mà bạn đang có.

Vui lòng đọc và có thể hỏi bất kỳ câu hỏi nào, ký tên dưới đây nếu bạn tham gia vào nghiên cứu này. Một bản sao của giấy này sẽ được gửi bạn giữ tham khảo cho tương lai. Nếu bạn có bất kỳ mối quan tâm cho việc chọn lựa hay điều trị như một người tham gia nghiên cứu, vui lòng liên hệ Cơ Quan Nghiên Cứu, Kepner Hall, Trường Đại Học Northern Colorado Greeley, CO 80639; 970-351-1910.

Vui lòng cho thông tin đồng ý này và hoàn thành bảng câu hỏi nghiên cứu (người đưa bạn mẫu thông tin này)

Thông tin liên lạc của hội đồng:

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Người tham gia

Số câu hỏi chi định _____

Ghi tên _____

Ký tên _____

APPENDIX C
ASSESSMENT TOOLS

**GLUCOSE EXCURSIONS PRE-ASSESSMENT—DIABETES MANAGEMENT
KNOWLEDGE ASSESSMENT TOOL IN ENGLISH AND VIETNAMESE**

DMKAT

**Optimizing Glucose Control in the Hospitalized Patient with Diabetes: Preventing
Glucose Excursions**

I. Demographics

Directions: Please take a few minutes to respond to the following: answer the following questions by placing an X in the box that best describes you, or filling in the blank for each question posed.

Age: _____

Gender: Female Male

Education: LPN ADN
Diploma

BSN MSN

Other _____

Specialty:

ICU ED Cardiology

Medicine Surgical Oncology

O & G Pediatrics

Other _____

Status: Part Time Full Time

Ethnicity: Kinh (Viet) Minority Other _____

Years of Nursing Experience: _____

Attendance at inservices/continuing education in which diabetes was the focus:

- None
- Within the last 6 months
- More than 6 months but less than 1 year ago
- More than 1 year ago but less than 2 years ago
- More than 2 years ago

Number of patients with diabetes you care for on a weekly basis:

- None
- 1-2
- 2-5
- 6-10
- > 10

Generally speaking, how competent do you feel in caring for a patient with diabetes?

0 = NOT COMPETENT to 10 = VERY COMPETENT. Circle the number that BEST describes you.

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

The greatest obstacle to managing blood glucose in the hospital: Check all that apply

- Personal knowledge deficit Hand-off communication
- Unclear glucose targets Unfamiliar with hospital policies
- Ineffective insulin regimen

Lack of coordination between BGM (Blood Glucose Monitoring) Insulin Administration and Meal Delivery

Other: _____

II. Self-Assessment:

Directions:

The following 2 statements assess your overall teaching skills and knowledge about diabetes management in the hospital:

Choose a number for each question.

1. Rate your overall teaching skill (instructing patients about managing symptoms, taking medications correctly, when to notify their physician, blood glucose monitoring, etc.) – 0 = Poor to 10 = Exceptional

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

2. Rate your overall knowledge of diabetes management (knowledge and side effects of glucose lowering agents, action and duration of different insulins, managing of high and low blood sugars, lifestyle modifications, etc.). 0 = None to 10 = Expert

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

III. Self-Assessment of Comfort

Directions:

The following 8 statements assess your comfort with diabetes management in the hospital. Please rate yourself on a scale from 1-10 with **0 = VERY UNCOMFORTABLE to 10 = VERY COMFORTABLE**. Circle the number that BEST describes you.

(Comfort is defined as a feeling of ease in performing the following skills).

1. General level of comfort in administering subcutaneous insulin
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
2. General level of comfort in teaching patients about insulin administration
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
3. General level of comfort in administering IV insulin infusions
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
4. General level of comfort in caring for patients with insulin pumps
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
5. General level of comfort in managing hyperglycemia (hyperglycemia is defined as a blood sugar >150 mg/dl)
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
6. General level of comfort in managing hypoglycemia (hypoglycemia is defined as a blood sugar <70mg/dL by the American Diabetes Association, ADA)
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
7. General level of comfort in teaching patients how to prevent and manage low blood sugars at home (low blood sugar is defined <70 mg/dL by the ADA)
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
8. General level of comfort in teaching patients about blood glucose monitoring (correct use of the meter, frequency and timing of glucose checks, and disposing of lancets and strips)
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

IV. Self-Assessment of Familiarity

The next series of statements assess your familiarity with **hospital** policies and resources regarding diabetes management. Please rate yourself on a scale from 1-10 with 0=VERY UNFAMILIAR to 10=VERY FAMILIAR. Circle the number that BEST describes you. Familiarity is defined as a thorough knowledge and understanding of the following policies.

9. General level of familiarity with diabetes management policy

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

10. General level of familiarity with hypoglycemia prevention and management policy

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

11. General level of familiarity with Insulin, Intravenous administration on non-ICU unit's policy

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

12. General level of familiarity with ICU intravenous administration policy

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

13. General level of familiarity with Insulin Pump policy (Patient's own medical device)

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

14. General level of familiarity with available resources for teaching patients about SURVIVAL SKILLS (Symptom Management, Medication and Insulin administration and Blood Glucose Monitoring)

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

V. Diabetes Knowledge

1. Infections may be more difficult to treat during hyperglycemia because:
 - a. macrophages lose their chemotaxis action
 - b. hypercoagulation occurs
 - c. insulin secretion increases
 - d. lipolysis slows healing

2. Neutrophil impairment begins to take place at what glucose level:
 - a. 300 mg/dL
 - b. 240 mg/dL
 - c. 180 mg/dL
 - d. 150 mg/dL

3. Glargine (Lantus[®]) is:
 - a. prandial insulin
 - b. basal insulin
 - c. correctional insulin
 - d. mixed insulin

4. Diabetes Survival Skill Education (education necessary for patient to be safe at home) includes:
 - a. eating healthy; being physically active; coping effectively
 - b. taking medication; monitoring blood glucose; managing symptoms
 - c. counting carbohydrates; reducing risks, injecting insulin

- d. knowing resources, eliminating sweets from diet, exercising 30 minutes a day
5. Treatment for hypoglycemia should be initiated at a blood glucose:
- a. Less than 40 mg/dL
 - b. Less than 50 mg/dL
 - c. Less than 60 mg/dL
 - d. Less than 70 mg/dL
6. When converting from a continuous IV insulin infusion to subcutaneous insulin, start subcutaneous basal insulin approximately:
- a. 2 hours before stopping the infusion
 - b. at the same time as stopping the infusion
 - c. 1 hour after stopping the infusion
 - d. no need for basal insulin
7. Basal insulin accounts for _____ % of daily insulin requirements:
- a. 25
 - b. 30
 - c. 50
 - d. 75
8. Patients with an illness such as flu or fever should be instructed to:
- a. stop insulin because of decreased caloric intake
 - b. limit food and drink due to nausea and vomiting
 - c. monitor blood glucose every 2-4 hours

- d. begin antiemetics
9. A novice nurse on a medical unit asks you to explain hypoglycemia unawareness. You respond:
- a. “This is a term used to explain patient’s lack of knowledge in treating hypoglycemia”
 - b. “It describes the phenomenon of adrenergic surge that occurs in hypoglycemia.”
 - c. “This occurs when someone injecting insulin loses consciousness due to a low blood sugar.”
 - d. It is “A condition in which a person with diabetes does not experience the usual early warning signs of hypoglycemia.”
10. The individual with diabetes at home who requires glucagon administration is:
- a. 14 year old mildly confused and diaphoretic
 - b. 27 year old nonresponsive and shaky
 - c. 35 year old disoriented and complaining of hunger
 - d. 4 year old crying and pale
11. The BEST nursing intervention to prevent hyperglycemia in hospitalized patients with diabetes is:
- a. administer basal and supplemental insulin even when patient is NPO
 - b. administer prandial/bolus insulin for tube feedings
 - c. initiate supplemental insulin when glucose >250 mg/dL
 - d. initiate an IV Insulin infusion when glucose exceeds 200mg/dL

12. Sharp medical waste (syringes, lancets) from the home should be disposed:
 - a. into home waste/trash
 - b. into a hard-sided container with a screw-on lid
 - c. into an empty aluminum can
 - d. into a plastic pop bottle

13. The most appropriate treatment for mild hypoglycemia in a conscious and unsedated patient is:
 - a. 12 oz can regular soda
 - b. 4 oz juice
 - c. 8 oz juice with 2 packets of sugar
 - d. 3 packages of graham crackers

14. Continuous IV insulin administration is the preferred method of treating DKA or HHS because an IV insulin infusion:
 - a. brings down the glucose more quickly than the subcutaneous route
 - b. sustains normal glucose once target glucose is achieved
 - c. facilitates insulin stacking
 - d. is more effective in regulating velocity of glucose change

15. All of the following insulin orders require clarification EXCEPT:
 - a. Lantus[®] 10 units at 0700, Levemir[®] 7 units at 0700 and 1730
 - b. NovoLOG[®] 5 units before meals, NovoLIN R 28 units at 0700 and 2200
 - c. Apidra[®] 6 units and NPH 15 units at 0700 and 1730
 - d. Apidra[®] 8 units before meals, Correctional Scale #2 with NovoLIN R

16. You should instruct your patient with newly diagnosed Type 2 diabetes, using oral glucose lowering agents, to do self-blood glucose monitoring (SBGM):
- before breakfast, and before and 2 hours after the largest meal of the day
 - before bedtime only
 - three times per week at different times
 - before breakfast only
17. After treatment and the patient's recheck, a blood glucose rose from 45 mg/dL-65 mg/dL. The next course of action is to:
- call the physician and hang an IV of D5 W
 - wait another 15 minutes and recheck
 - give another 15 gms of carbohydrates
 - administer an amp of D₅₀
18. All of the following contribute to development of hyperglycemia in the hospitalized patient EXCEPT:
- vasopressors
 - holding insulin for normal glucose
 - tube feedings
 - nutrition interruption
19. Patients should be instructed to notify their physician with:
- one unexplained glucose of < 70 mg/dL
 - two fasting glucoses >126 mg/dL
 - blood glucose >150 mg/dL for one week

- d. two consecutive glucoses of 180 mg/dL
20. Your patient takes insulin glargine (Lantus®) at bedtime and insulin glulisine (Apidra®) insulin with meals.

	Breakfast	Lunch	Dinner	HS
	Before mg/dL	Before mg/dL	Before mg/dL	Mg/dL
Tuesday	86	58	97	78
Wednesday	126	62	89	74
Thursday	111	66	92	80
Friday	420		172	

As you review the blood glucose levels, you know that the insulin dose that needs to be adjusted is:

- a. bedtime Lantus®
- b. morning Apidra®
- c. lunchtime Apidra®
- d. dinner Apidra®

ĐÁNH GIÁ KIẾN THỨC QUẢN LÝ BỆNH ĐÁI THÁO ĐƯỜNG

Tối ưu hóa kiểm soát đường huyết cho bệnh nhân đái tháo đường nằm viện:

Ngăn ngừa thay đổi đường huyết đột ngột

I. Nhân trắc học:

Hướng dẫn:

Vui lòng dành vài phút để trả lời các câu hỏi sau: trả lời các câu hỏi bằng cách đánh dấu

X vào ô có mô tả đúng nhất, theo bạn, hoặc điền vào các khoảng trống dưới mỗi câu hỏi.

Tuổi: _____

Giới tính: Nữ Nam

Học vấn: Sơ cấp Trung cấp

Cao đẳng

Đại học Thạc sĩ

Khác: _____

Khoa :

Hồi sức tích cực Cấp cứu Tim mạch

Nội khoa Ngoại Ung bướu

Sản Nhi

Khác _____

Tình trạng làm việc: Bán thời gian Toàn thời gian

Dân tộc:

Kinh Thiếu số Khác _____

Số năm kinh nghiệm làm điều dưỡng: _____

Tham gia thực hành/ đào tạo liên tục về đái tháo đường:

- Không
- Trong vòng 6 tháng
- > 6 tháng, nhưng < 1 năm
- > 1 năm, nhưng > 2 năm
- > 2 năm

Tổng số bệnh nhân đái tháo đường được bạn chăm sóc hàng tuần:

- Không
- 1- 2
- 2- 5
- 6- 10
- > 10

Nói chung, bạn cảm thấy đủ năng lực chăm sóc bệnh nhân đái tháo đường như thế nào?

0= KHÔNG CÓ NĂNG LỰC to 10 = RẤT CÓ NĂNG LỰC. Khoanh tròn vào số

phù hợp nhất với bạn

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

Trở ngại lớn nhất để quản lý đường huyết trong bệnh viện. Kiểm tra các chuyên mục sau:

- Thiếu kiến thức cá nhân
- Thông tin chuyên gia
- Mục tiêu đường huyết không rõ ràng
- Không hiểu rõ quy định bệnh viện
- Phác đồ insulin không hiệu quả
- Thiếu sự kết hợp giữa kiểm soát đường huyết, sử dụng Insulin và ăn uống

□ Khác: _____

II. Tự đánh giá:

Hướng dẫn:

1. Mức độ chung về kỹ năng giảng dạy của bạn (hướng dẫn bệnh nhân quản lý các triệu chứng, sử dụng thuốc chính xác, khi nào cần thông báo cho bác sĩ, theo dõi đường huyết...) – 0 = Kém đến 10 = Rất tốt

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

2. Mức độ chung về kiến thức về quản lý đái tháo đường (kiến thức và phản ứng phụ của các tác nhân hạ đường huyết, hoạt động và thời gian của các loại insulin khác nhau, quản lý tăng đường huyết & hạ đường huyết, thay đổi cách sống,...) -

0 = Không đến 10 = Thông thạo

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

III. Tự đánh giá về sự thoải mái:

Hướng dẫn:

Sự thoải mái của bạn về quản lý đái tháo đường tại bệnh viện được đánh giá bằng 8 mục sau. Vui lòng tự đánh giá theo thang điểm từ 1- 10 với 0 = KHÔNG

THOẢI MÁI đến 10 = RẤT THOẢI MÁI. Khoanh tròn vào số phù hợp nhất với bạn

(Thoải mái được định nghĩa là cảm giác dễ dàng khi thực hiện các kỹ năng sau)

1. Mức độ thoải mái khi tiêm insulin dưới da

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

2. Mức độ thoải mái khi giảng dạy cho bệnh nhân về việc sử dụng insulin

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

3. Mức độ thoải mái khi sử dụng insulin truyền

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

4. Mức độ thoải mái khi chăm sóc bệnh nhân có bơm tiêm Insulin

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

5. Mức độ thoải mái cho việc quản lý tăng đường huyết (tăng đường huyết được định nghĩa khi đường huyết >150 mg/dl)

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

6. Mức độ thoải mái cho việc quản lý hạ đường huyết (hạ đường huyết được định nghĩa khi đường huyết < 70 mg/dl, theo Hiệp Hội Đái tháo đường Mỹ)

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

7. Mức độ thoải mái khi giảng dạy cho bệnh nhân làm thế nào để ngăn ngừa và quản lý việc hạ đường huyết tại nhà (hạ đường huyết được định nghĩa khi đường huyết < 70 mg/dl, theo Hiệp Hội đái tháo đường Mỹ))

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

8. Mức độ thoải mái khi giảng dạy cho bệnh nhân về việc theo dõi đường huyết (sử dụng chính xác máy đo, đo đường huyết thường xuyên và đúng giờ, xử lý kim và que đo)

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

IV. Tự đánh giá về sự quen thuộc:

Các mục kế tiếp đánh giá về sự quen thuộc về quy định tại **bệnh viện** và nguồn lực liên quan đến quản lý đái tháo đường. Vui lòng tự đánh giá theo thang điểm từ

1- 10 với 0 = RẤT KHÔNG QUEN THUỘC đến 10 = RẤT QUEN THUỘC.

Khoanh tròn vào số phù hợp nhất với bạn

(Quen thuộc được định nghĩa là cảm giác dễ dàng khi thực hiện các kỹ năng sau)

9. Mức độ quen thuộc với quy định quản lý đái tháo đường

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

10. Mức độ quen thuộc với quy định ngăn ngừa hạ đường huyết

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

11. Mức độ quen thuộc với quy định quản lý truyền insulin tại các đơn vị ngoài khoa ICU

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

12. Mức độ quen thuộc với quy định quản lý truyền insulin tại khoa ICU

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

13. Mức độ quen thuộc với quy định tiêm insulin qua bơm tiêm điện (thiết bị của bệnh nhân)

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

14. Mức độ quen thuộc với nguồn lực sẵn sàng để dạy cho bệnh nhân về kỹ năng sống sót (quản lý triệu chứng, quản lý Insulin và thuốc và theo dõi đường huyết)

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

V. Kiến thức đái tháo đường:

1. Nhiễm trùng có thể khó điều trị hơn trong khi tăng đường huyết, bởi vì:

- a. đại thực bào (macrophages) giảm hóa hướng động
- b. xảy ra tăng đông (hypercoagulation)
- c. tăng tiết insulin
- d. tiêu hủy mỡ chậm lành vết thương

2. Mức đường huyết bắt đầu gây suy giảm bạch cầu trung tính (neutrophil)
 - a. 300 mg/dL
 - b. 240 mg/dL
 - c. 180 mg/dL
 - d. 150 mg/dL

3. Glargine (Lantus[®]) là:
 - a. insulin tác dụng nhanh/ Prandial insulin
 - b. insulin nền (tác dụng kéo dài)/ Basal insulin
 - c. insulin điều chỉnh/ Correctional insulin
 - d. insulin hỗn hợp/ Mixed insulin

4. Giáo dục kỹ năng sống sót (giáo dục cần thiết cho bệnh nhân được an toàn tại nhà) bao gồm:
 - a. ăn uống lành mạnh; được hoạt động thể chất; giảm stress hiệu quả
 - b. sử dụng thuốc; theo dõi đường huyết; quản lý triệu chứng
 - c. tính lượng tinh bột; giảm nguy cơ, tiêm insulin
 - d. Hiểu biết nguồn lực, hạn chế chất ngọt từ ăn uống, tập thể dục 30 phút/ngày

5. Điều trị hạ đường huyết nên được bắt đầu với mức đường huyết:
 - a. thấp hơn 40 mg/dL
 - b. thấp hơn 50 mg/dL
 - c. thấp hơn 60 mg/dL
 - d. thấp hơn 70 mg/dL

6. Khi chuyển đổi từ insulin truyền tĩnh mạch liên tục sang insulin tiêm dưới da, bắt đầu từ tiêm dưới da insuline nền (tác dụng kéo dài) thích hợp:
- 2 giờ trước khi dừng truyền tĩnh mạch
 - tại thời điểm dừng truyền tĩnh mạch
 - 1 giờ sau khi dừng truyền tĩnh mạch
 - không cần cho insulin nền (tác dụng kéo dài)
7. Insulin nền (tác dụng kéo dài) chiếm _____ % nhu cầu insulin hàng ngày:
- 25
 - 30
 - 50
 - 75
8. Bệnh nhân bị bệnh như cúm hay sốt nên được hướng dẫn:
- dừng insulin vì giảm lượng calo nhận vào
 - hạn chế ăn uống vì buồn nôn hay nôn
 - theo dõi đường huyết mỗi 2-4 giờ
 - bắt đầu cho thuốc chống nôn
9. Một điều dưỡng mới vào khoa yêu cầu bạn giải thích về cảnh báo hạ đường huyết. Bạn trả lời:
- “đây là thành ngữ dùng để giải thích bệnh nhân thiếu kiến thức khi điều trị hạ đường huyết”
 - “đây là hiện tượng tăng adrenergic xảy ra khi hạ đường huyết”

- c. “điều này xảy ra khi một người tiêm insulin bị mất ý thức do lượng đường trong máu thấp”
 - d. đây là “1 tình trạng mà người đái tháo đường không có kinh nghiệm cho các dấu hiệu cảnh báo sớm thông thường của hạ đường huyết”
10. Người mắc bệnh đái tháo đường tại nhà cần sử dụng glucagon:
- a. 14 tuổi lú lẫn nhẹ và mất nước
 - b. 27 tuổi không đáp ứng và run rẩy
 - c. 35 tuổi không nhận thức và phản nản đói
 - d. 4 tuổi khóc và nhợt nhạt
11. Can thiệp TỐT nhất của điều dưỡng ngăn ngừa tăng đường huyết cho bệnh nhân đái tháo đường nằm viện là:
- a. sử dụng insulin nền (tác dụng kéo dài) và insulin bổ sung ngay khi bệnh nhân không ăn uống qua đường miệng (NPO)
 - b. sử dụng insulin tác dụng nhanh hoặc tiêm nhanh insulin cho trường hợp ăn qua ống thông
 - c. bắt đầu insulin bổ sung khi đường huyết >250 mg/dL
 - d. bắt đầu truyền tĩnh mạch insulin khi đường huyết vượt quá 200mg/dL
12. Bình hủy y tế (ống tiêm, kim) sử dụng tại nhà nên bỏ vào:
- a. thùng rác tại nhà
 - b. thùng cứng với nắp đậy chặt
 - c. thùng nhôm rỗng
 - d. chai nhựa

13. Điều trị thích hợp nhất cho hạ đường huyết nhẹ trên bệnh nhân tinh tảo và không có an thần là
- lon soda 12 oz (350ml)
 - nước trái cây 4 oz (110ml)
 - nước trái cây 8 oz (220ml) với 2 gói đường
 - 3 gói bánh quy.
14. Sử dụng truyền insulin liên tục là phương pháp tốt nhất điều trị toan máu- Diabetic Ketoacidosis (DKA) hoặc hội chứng tăng đường huyết- Hyperglycaemic Hyperosmolar State (HHS) vì insulin được truyền vào tĩnh mạch:
- làm hạ đường huyết nhanh hơn đường tiêm dưới da
 - duy trì lượng đường bình thường khi đạt được mục tiêu đường
 - giảm insulin tích lũy
 - hiệu quả hơn trong việc điều chỉnh tốc độ thay đổi đường huyết
15. Tất cả y lệnh về insulin cần được xác nhận lại trước khi thực hiện, NGOẠI TRỪ
- Lantus[®] 10 đơn vị lúc 7:00, Levemir[®] 7 đơn vị lúc 7:00 và 17:30
 - NovoLOG[®] 5 đơn vị trước bữa ăn, NovoLIN R 28 đơn vị lúc 7:00 và 22:00
 - Apidra[®] 6 đơn vị và NPH 15 đơn vị lúc 7:00 và 17:30
 - Apidra[®] 8 đơn vị trước bữa ăn, Correctional Scale # 2 with NovoLIN R
16. Bạn nên hướng dẫn bệnh nhân mới được chẩn đoán tiểu đường Type 2, giảm ăn uống các tác nhân có đường, tự theo dõi đường huyết (SBGM):
- trước ăn sáng, và 2 giờ trước bữa ăn chính trong ngày

- b. chỉ trước khi ngủ
- c. ba lần mỗi tuần tại các thời điểm khác nhau
- d. chỉ trước khi ăn sáng
17. Sau điều trị và kiểm tra lại cho bệnh nhân, đường huyết tăng từ 45 mg/dL-65 mg/dL. Hành động kế tiếp là:
- a. gọi bác sĩ và treo chai dịch truyền Dextrose 5%
- b. chờ thêm 15 phút và kiểm tra lại
- c. cho 15 gam tinh bột khác
- d. sử dụng Dextrose 50% dạng ống tiêm
18. Góp phần làm gia tăng đường huyết cho bệnh nhân nằm viện. Ngoại trừ:
- a. thuốc vận mạch/ vasopressors
- b. giữ insulin cho đường huyết bình thường
- c. cho ăn qua ống thông
- d. gián đoạn dinh dưỡng
19. Bệnh nhân cần được hướng dẫn thông báo cho bác sĩ khi:
- a. đường huyết, đo 1 lần < 70 mg/dL, không giải thích được
- b. đường huyết khi đói, đo hai lần >126 mg/dL
- c. đường huyết trong 1 tuần >150 mg/dL
- d. đường huyết, đo hai lần liên tiếp 180 mg/dL
20. Bệnh nhân của bạn sử dụng insulin glargine (Lantus®) trước khi đi ngủ và glulisine (Apidra®) cùng với bữa ăn

	Ăn sáng	Trưa	Tối	HS
	Trước mg/dL	Trước mg/dL	Trước mg/dL	mg/dL

Thứ ba	86	58	97	78
Thứ tư	126	62	89	74
Thứ năm	111	66	92	80
Thứ sáu	420		172	

Khi bạn xem lại mức đường huyết, bạn biết rằng liều insulin cần điều chỉnh là:

- a. Trước khi ngủ/ bedtime Lantus®
- b. buổi sáng/ morning Apidra®
- c. buổi trưa/ lunchtime Apidra®
- d. buổi tối/ dinner Apidra®

APPENDIX D
PERMISSION TO USE DIABETES MANAGEMENT
KNOWLEDGE ASSESSMENT TOOL

From: Nguyễn Thị Xuân Mai (VMEC-KVH-BV VMCP) <v.maintx@vinmec.com>
Sent: Sunday, March 17, 2019 12:26 AM
To: Modic, Mary Beth
Cc: kathleen.dunemn@unco.edu; mai nguyen
Subject: [EXT] Request Permission to use DMKAT

Dear Dr Mary Beth Modic,

Dear Dr Kathleen Dunemn (my supervisor),

My name is Nguyen Thi Xuan Mai. I am a student of Master of Science in Nursing (MSN) at University of Northern Colorado (UNC) in Greeley, Colorado. In my capstone project, I am planning to assess new nurses' level of knowledge, comfort and familiarity in caring diabetes patient during hospitalization.

This study will be conducted in Vinmec Central Park general hospital with 150 beds at the first stage in Ho Chi Minh city, Southern Viet Nam. The results of study may develop a training program for new nurses in Vinmec health care system in Viet Nam.

I am requesting of your permission for using Diabetes Management Knowledge Assessment Tool (DMKAT) in my research.

I look forward to hearing from you.

Respectfully,

Xin cảm ơn & Trân trọng kính chào
Thanks & Best Regards

Nguyễn Thị Xuân Mai
OPD Nurse Manager
[T] (+84 8) 3622 1166
[M] (+84 9) 0997 1571
[E] v.maintx@vinmec.com
[W] www.vinmec.com
[A] 208 Nguyen Huu Canh Street, Ward 22, Binh Thanh District
HCM City, Viet Nam.

Modic, Mary Beth <MODICM@ccf.org>

Mon, Mar 18, 9:21 AM

to Nguyễn, kathleen.dunemn@unco.edu, me

Dear Nguyen Thi Xuan Mai,

I have attached the DMKAT and answer key. You have my permission to make changes to the first four sections - Demographic, Self- Assessment, Self- Assessment of Familiarity , Self - Assessment of Comfort to reflect the needs of the data you wish to collect.

You also have my permission to change the name of the rapid acting insulin that is used at the study site that is pharmacokinetically equivalent.

Good luck with your study!

Sincerely,
Mary Beth Modic