FACTORS INFLUENCING ATTENDANCE TO EYE SCREENING AMONG DIABETES MELLITUS PATIENTS IN KUANTAN, PAHANG

BY

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A thesis submitted in fulfillment of the requirement for the degree of Master in Nursing Science

Kulliyyah of Nursing
International Islamic University Malaysia

OCTOBER 2018

ABSTRACT

Diabetes Mellitus (DM) is on a rising trend globally and the complications of DM particularly diabetic retinopathy are kept on escalating. However, the number of patients who underwent proper eye screening in Malaysia is still far from satisfactory. The aim of this thesis is to identify the facilitating factors, barriers for DM patients to go for eye screening, and to explore current management of eye screening for diabetic patients and how it influences the attendance for routine eye screening. This study used a mixed-method study design. The quantitative involves a cross-sectional survey of 170 pparticipantss using self-administered questionnaires. The data was analysed descriptively using SPSS in understanding the facilitators and barriers for eye screening among diabetes patients. Subsequently, ten in-depth face to face semi-structured interviews with healthcare professionals with additional of document analysis was conducted to understand the eye screening provision in the study settings. The qualitative data was managed manually and analysed thematically. Majority of participants 45.9 % (n=78) highlighted that lack of information regarding diabetes and not understanding the significance of eye screening are the barriers to eye screening. Whereas 10.6% (n=18) reported lack of access to healthcare facilities, 6.5% (n=11) experienced time limitation and 2.9% (n=5) suffered financial issues. However, more than half of participants (58.2%) have good knowledge related to diabetic eye complication. There is a significant difference between educational level with patients' attendance in yearly eye screening; $\chi 2 = 8.32$, $df = 2$, $p<0.05$. From qualitative part, the factors that influence the attendance to eye screening were health care providers' confidence in performing eye screening, effectiveness of green card system, interactive health educational session and continuous support from family members. Lack of information received by the patients on the importance of eye screening and communication issues seems to be prominent and become the reasons for patients' not attending eye screening. Having a structured programme which emphasises on the importance of eye screening could able to empower the patients and facilitate better communication strategy between patients and healthcare professionals. This simultaneously would increase the interest of the patient to follow the schedule of eye screening in order to achieve better health outcomes. For further research, the improvement of default tracking systems and the provision of eye-related educational material are important to enhance health literacy among diabetic patients and the population of Malaysia.

خلاصة البحث

ان مرض السكري في انتشار مستمر على مستوى العالم، حيث ان مضاعفات مرض السكري وخصوصا اعتلال الشبكية السكري في ازدياد مستمر. ومع ذلك فإن عدد المرضى الخاضعين للفحوصات الدقيقة للعيون في ماليزيا لا يزال بعيدا عن المستوى المطلوب. الهدف من هذه الرسالة هو تحديد العوامل الميسرة والعوامل المعيقة أمام مرضى السكري للكشف عن العيون، واستكشاف طرق الإدارة الحالية لفحص عيون مرضى السكري وكيفية تأثيره على حضورهم لفحص العين الروتيني. استخدمت هذه الدراسة تصميما مختلط الطرق. تضمن الجزء الكمي مسحا مستعرضًا لـ170 مشاركًا باستخدام استبيانات أُعطيت ذاتيا. تم تحليل البيانات وصفيا باستخدام برنامج SPSS لفهم دوافع وحواجز الذهاب لفحص العيون بين مرضى السكري. أجريت لاحقا عشر مقابلات متعمقة وجها لوجه مع متخصصي الرعاية الصحية مع تحليل إضافي للوثائق لفهم تسهيلات فحص العيون في إعدادات الدراسة. تمت إدارة البيانات النوعية يدويًا وتحليلها بشكل موضوعي. صرّح معظم المشاركين 45.9٪ (n=78) بأن عدم وجود معلومات عن مرض السكري وعدم فهم أهمية فحص العيون حالتا دون ذهابهم لفحص العيون، في حين أفاد 10.6٪ (n=18) بصعوبة الوصول إلى مرافق الرعاية الصحية، وعانى 6.5٪ (n=11) من الوقت المحدود، واشتكى 2.9٪ (n=5) من مشاكل مالية، ومع ذلك فقد كان لدى أكثر من نصف المشاركين (58.2٪) معرفة جيدة بمضاعفات العين السكري. كان هناك أيضا فرق كبير بين المستوى التعليمي وحضور المرضى للفحص السنوي للعيون؛ χ^2=8.32، df=2، 0.05. أما بالنسبة للجزء النوعي فان العوامل التي تؤثر على حضور المرضى لفحص العيون هو ثقة متخصصي الرعاية الصحية في إجراء فحص العيون، وفعالية نظام البطاقة الخضراء، والجلسة التعليمية الصحية التفاعلية، والدعم المستمر من أفراد الأسرة. اتضح أن نقص المعلومات التي يتلقاها المرضى حول أهمية فحص العيون ومشاكل التواصل كانت أمورا بارزة حيث أصبحت السبب وراء عدم حضور المرضى لفحص العيون. بإمكان وجود برنامج منظم يؤكد على أهمية فحص العين أن يؤدي إلى تمكين المرضى وتسهيل استراتيجية التواصل الأمثل بين المرضى والمتخصصين في الرعاية الصحية، والذي من شأنه أن يزيد من اهتمام المرضى في اتباع جدول فحص العيون الخاص بهم من أجل تحقيق نتائج صحية أفضل. لمزيد من الأبحاث مستقبلا فإنه من المهم تحسين أنظمة التعقب الحالية وتوفير المواد التعليمية المتعلقة بالعيون لتعزيز الوعي الصحي بين مرضى السكري وسكان ماليزيا.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master in Nursing Science.

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DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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ACKNOWLEDGEMENTS

I am grateful to the Almighty Allah, the most gracious and the most merciful who granted me strength throughout this journey. I would like to extend special appreciation to my supervisors, Asst. Prof. Dr Sanisah Saidi and Asst. Prof. Dr Adzura Salam for giving me their full support, encouragement, and guidance. Thank you for your endless efforts. Special thanks also to the Principle Investigator of this study grant, Sr Sumaiyah Jamaludin @ Thandar Soe for her guidance.

I would like to thank the Ministry of Higher Education, the Ministry of Health, the RIGS Grant, and IIUM for their support in realising this study. In addition, I would like to express my gratitude to all my lecturers, staff, and post graduate colleagues from Kulliyyah of Nursing, International Islamic University Malaysia (IIUM), and Universitas Muhammadiyah Jogjakarta (UMY) especially Madihah Abdullah who has given me encouragement, knowledge, and experience during this journey.

I would like to dedicate my thanks to all my dear friends who have continually supported me throughout this journey; Mastura, Razida, RusilaAqilah, Suriana, Hajar, Diamond members (Hanis, Ainul, Aliya, Safia, Sarah, Syafiah, K.Hamnah, K.Hanim), Sahabat Jannah teammates (Ain, Jun, Hajar, Aini, Fatimah, K.Akma, K.Hamidah, K.Siti), and all my supportive friends. Also special dedication goes to my lifetime teachers; Dr Azizah Md. Radzi and Puan Khadijah Atan for their endless encouragement in my life.

Finally, I would like to express my special appreciation to my beloved husband; Mohd Iman Bin Saiful Suhardi, my supportive parents; Hj. Mat Isa Hasan And Hjh Zaini Din, my siblings (Rifqatul Madihah, Nadhratun Naimah, Nusratunnajiah, Farahatun Nabilah, Naqiyyatul‘Abidah, Muhd Nu’man and Muhd Mu’az) and all family members. Finally, thanks to my lovely parents-in-laws; Hj Saiful Suhardi, Hjh Zainora,and family in-laws for their endless love and support during my challenging journey. Thank you very much.

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LIST OF ABBREVIATION

DES	Diabetic eye screening
DM	Diabetes Mellitus
DO	Direct Ophtalmology
DR	Diabetic Retinopathy
HbA1c	Glycated Haemoglobin (A1c), which identifies average plasma glucose concentration
HCP	Health care provider
NPDR	Non-proliferative Diabetic Retinopathy (NPDR)
PFCC	Patient or Family-centred Care
PDR	Proliferative Diabetic Retinopathy
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

This chapter explains the background of the problem related to patients with Diabetes Mellitus complications, the current practice of eye screening in Malaysia, and reasons for eye screening. Based on this study background, further discussion will direct the development of research questions that will guide the literature review and initiation of this study.

1.2 BACKGROUND OF THE STUDY

Diabetes Mellitus (DM) is on a global rising trend. The International Diabetes Federation (IDF) predicts that the prevalence of DM in South East Asia will increase by twofold by the year 2025. The World Health Organization (WHO) estimates that in the year 2030, Malaysia will have a total of 2.48 million people with DM (Goh et al., 2010). In Malaysia, based on the National Health and Morbidity Survey 2011, the prevalence of known and newly diagnosed diabetes has risen from 11.6% in 2006 to 15.3% in 2011, regarding patients aged above 18 and 30 years respectively (Feisul and Azmi, 2013).

There are many complications of DM Type I and Type II, which include vascular (macrovascular and microvascular) problems, eye disease, kidney problems, diabetic neuropathy, diabetic foot, infections, and skin alterations (Feisul and Azmi, 2013; Kumar and Clark, 2016). In the National Diabetes Registry, the rates of unknown complications in 2012 were 12.3% for nephropathy, 15.2% for retinopathy, 12.8% for Ischemic Heart Disease (IHD), 12.5% for cerebrovascular disease, 11.1%

for diabetic foot ulcers, and 11.0% for amputation. This situation involved 2.6 million adults age 18 years and above living with diabetes, which increases the burden of RM 2.9 billion in the management of chronic disease (Feisul and Azmi, 2013).

Diabetic retinopathy (DR) is one of the most common diabetes complications that affects 36.8% of diabetic patients in Malaysia (Feisul and Azmi, 2013), and the incidence of visual and ocular complications increases with age and the duration of the disease (Bamashmus, Gunaid, and Khandekar, 2008). Eye complications in diabetic patients include diabetic retinopathy (category: DR, Proliferative Diabetic Retinopathy (PDR), Non-proliferative Diabetic Retinopathy (NPDR), diabetic macular oedema, rubeosis iridis, cataract, glaucoma, retinal detachment, pseudo-exfoliation, vitreous haemorrhage, cranial nerve palsy, central retinal vein occlusion, uveitis, pterygium, corneal pathologies, age-related macular degeneration, and disc oedema (Ministry of Health Malaysia, 2011a). However, DR is the most common microvascular complication that leads to complete loss of vision, which results from retinal vascular damage due to poor glycaemic control (Goh, Omar, and Yusoff, 2010).

In Malaysia, the prevalence of DR from the 2007 Eye Registry was 36.8%, slightly higher than the prevalence of 35% found in the Singapore Malay Eye Study 2006 (Gangwani et al., 2014). It was also reported that DR was the second highest complication among diabetic patients in Malaysia (Feisul and Azmi, 2013). DR does not just cause physical deterioration due to loss of vision; it also has devastating effects on patients' quality of life, including loss of productivity and the socioeconomic burden to the family through changes in daily activity, living, and roles in their social interaction with others (Leone, Coast, Narayanan, and Aikins, 2012).

Thus, eye screening is one of the important measures to delay the occurrence of blindness due to DR. In the Clinical Practice Guidelines, it is recommended that an initial fundus examination for an adult should be conducted after diagnosis of Type II Diabetes Mellitus (DM), or within three to five years after the initial diagnosis of Type I DM and prior to conception in women with pre-existing DM (Ministry of Health Malaysia, 2011a).

1.3 PROBLEM STATEMENT

Despite the devastating impact of DR on patients being clearly presented in literature, the issue of patients' attendance to clinics for eye screening is still unresolved. The first Annual Report of the National Eye Database (2012) reported that 7,701 (70.9%) out of 10,929 DM patients had never undergone eye screening and, according to the Clinical Practice Guideline (CPG), only 998 from a total number of 10,929 diabetic patients had undergone eye screening (Pin, Elias, Zuraidah, and Mariam, 2007). In the third National and Health Morbidity Survey (2012), the Ministry of Health stated that 45% of diabetic patients have undergone eye examination. However, respondents reported that they had eye screening within different time ranges (32.9% within the last year, 49.7% within the last 6 months, and 17.4% were checked more than two years ago).

This report reflected that in spite of advancement in technology and fully-equipped facilities for eye screening in the Malaysian healthcare system (Ministry of Health Malaysia, 2011a), the number of patients who underwent proper eye screening is still far from satisfactory and the study regarding this aspect in the Malaysian setting is secluded. It is clear that Diabetic eye screening remains an important issue to prevent sight-threatening Diabetes Retinopathy (STDR) among Diabetes Mellitus

patients. Through quantitative studies, it shown that some factors influencing decision needed specifically on this issue.

In addition, through qualitative studies, different perspectives have been viewed by health care providers and diabetic patients, especially regarding the issue of current implementation and barriers to eye screening. Although many studies discuss these in part, the main issue of adherence to eye screening per se is still vogue. Therefore, instead of advancement in the technology and facilities provided by our health care system, exploration of the factors influencing the attendance of eye screening among diabetic patients, and the support available for this issue, is needed. Hence, factors that influence patients' attendance to clinics for eye screening have been deliberated within the literature review. Based on these issues, this study aims to explore factors that contribute to diabetic patients' decisions regarding eye screening and is designed to answer the following research questions and meet the research objectives.

1.4 RESEARCH QUESTIONS

The research questions for this study are:

1. What are the facilitators (access, awareness) for eye screening among diabetic patients in Kuantan?
2. What are the barriers that are perceived by patients with diabetes that restrict them regarding undergoing routine eye screening?
3. What is the relationship between the frequency of eye screening and sociodemographic data?
4. What is the relationship between the frequency of eye screening and knowledge score?

5. What is the management of the health care provider regarding diabetic eye screening within primary and tertiary health centres in Kuantan, Pahang?

1.5 RESEARCH OBJECTIVES

The general objective of this study is to determine the facilitators and barriers of eye screening among diabetic patients. The specific objectives are:

1. To identify the facilitators for patients with diabetes regarding undergoing routine eye screening;
2. To identify barriers that restrict the patients with diabetes from undergoing routine eye screening;
3. To identify the relationship between the frequency of attendance to eye screening with sociodemographic data;
4. To identify the relationship between the frequency of attendance to eye screening and knowledge score; and
5. To explore the current management of eye screening for diabetic patients within the Ministry of Health (MOH) setting and how it influences the attendance of patients for routine eye screening.

1.6 SIGNIFICANCE OF THE STUDY

This study aims to determine facilitators and barriers to eye screening among diabetic patients. This study also examines the relationship between the facilitators and barriers to patients' attendance of eye screening and explores the practice of health care professionals with regards to eye screening of patients with diabetes in the Kuantan area. Findings of this study provide an understanding of the factors that influence

patients' decisions regarding eye screening and its relationship with the sociodemographic and knowledge score.

Furthermore, this study provides a platform to analyze the challenges for eye screening that are faced by diabetic patients. As this study explores the current practice in view of the system applied for eye screening, it hopes that it could confirm the current situation. By having this information, further planning or intervention could be done to improvise patients' health outcomes. It provides clear information of loopholes to be addressed by health care providers and the health care system.

For health care providers, this study becomes revenue for knowledge and experience, sharing their practice in the administration of eye screening among diabetic patients, particularly in Kuantan. Throughout this study, the researcher was exposed to the current system in managing eye screening modalities; recognizing the management system, the tracking system, and promotion of diabetic eye screening.

In all, this study provides information on factors for patients' attendance to diabetes eye screening. This information could help to improve current systems in the provision of suitable health care services, such as integrated health education sessions. Special measures must be included in the current management, such as expenditure, health communication strategies, and the involvement of family members in self-care to provide the best care for non-communicable disease groups, especially DM patients.

1.7 DEFINITIONS OF TERMS

Barriers

Something material that blocks, or is intended to block, a passage (highway barriers, a barrier contraceptive,(geographic barriers to species dissemination, barrier beaches, drugs that cross the placental barrier) (Merriam-Webster, 2018).

Diabetic Retinopathy

It composed of a characteristic group of lesions found in the retina of an individual who has diabetes mellitus for several years. The abnormalities that characterize diabetic retinopathy occur in predictable progression with minor variations to the order of their appearance. Diabetic retinopathy is the result of vascular changes in retinal circulation. In the early stages, vascular occlusion and dilations occur. it progresses into a proliferative retinopathy with the growth of new blood vessels. Macular oedema (the thickening of the central part of the retina) can significantly decrease visual acuity (WHO, 2008).

Eye Screening

A regular examination of the eyes to detect any specific changes in diabetic retinopathy that could soon affect sight, namely Sight-Threatening Diabetic Retinopathy (Ministry of Health Malaysia, 2011a). This study meant to evaluate the patients' attendance to yearly eye screening.

Facilitator

Someone or something that facilitates something; especially someone who helps to bring about an outcome (such as learning, productivity, or communication) by

providing indirect or unobtrusive assistance, guidance, or supervision (Merriam-Webster, 2018).

Knowledge on Ocular Complication

Understanding of information about a subject that you get by experience or study, either known by one person or by people generally (Cambridge, 2008). In this study, the response regarding the part of the eyes that should be examined by health care provider to review the eyes of diabetic patients, part of eyes that involved in the disease and treatment involved.

1.8 SUMMARY

Despite the devastating impact of DR on patients with diabetes, the issue of eye screening attendance is still unresolved. Thus, the findings from this study help to provide information regarding the underlying cause of poor attendance to eye screening and assist in the development of strategies to improve health care services pertaining to eye screening among patients with diabetes In Malaysia. A comprehensive literature review was performed to understand the phenomenon of diabetic eye screening and is explained in the next chapter.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter consists of two parts; part one discusses the aetiology of ocular disease while part two discusses the process of the literature review and findings, which evolve around issues regarding diabetes eye screening. The literature review revealed the need for further research after key notes were identified from other studies

2.2 PART ONE: THE AETIOLOGY OF OCULAR DISEASE

2.2.1 Diabetic Ocular Complications

Diabetes Mellitus is a multisystem disease, which, if left unattended, results in multi-organ damage that mainly affects the vasculature of the eyes, kidneys, brain, heart, and extremities. In the eyes, it can affect the external structures of the eye to the retina. it can result in recurrent styes, chalazion, chronic glaucoma, cataracts, vitreous haemorrhages, diabetic retinopathy, cranial nerve palsies, blindness (Bodunde, 2014), cataracts (2–4 times more common than in healthy people), glaucoma, keratopathy, refractive changes, oculomotor nerve paralysis, chronic inflammation of the eyelids, or diabetic retinopathy (Calvo, 2014).

Ocular structures are responsible for maintaining good visual quality, including the tear film, cornea, crystalline lens, vitreous, and retina. Maintaining a normal ocular surface is essential for retinal image quality. However, these structures undergo numerous morphological, structural, and physiological changes during the course of DM through increased higher-order aberrations (HOAS) and ocular

scattering. in diabetic patients, the most frequent and measurable alterations of the tear film function are reduced tear secretion; tear film instability (tear film break-up time (TBUT), a higher degree of conjunctival squamous metaplasia, lower goblet cell density, and reduced corneal sensitivity.

The mechanism of changes is still unclear, but some studies suggest that diabetic neuropathy affects the innervation of the lachrymal gland and the fluctuation in the lachrymal gland secretory function, causing a decrease in basal tear secretion and TBUT, while other studies state that basal tear secretion and TBUT do not Change (Calvo, 2014). Also, DM affects every corneal structure. they show significant and characteristics signs, such as epithelial defects, recurrent epithelial erosions, delayed re-epithelization, slow wound repair, increased autofluorescence, altered epithelial and endothelial barrier functions, ulcers, and increased susceptibility to injury. Some researchers indicate that corneas of patients with DM tend to present greater central corneal thickness (CCT). In addition, diabetic patients have decreased corneal sensitivity, which leads to corneal trauma.

A rapid reduction in blood glucose could cause an aggravation of both the retinopathy status and refractive changes causing a reduction in visual acuity. refractive changes occur frequently, either acutely or long-term, in people with dm. for acute changes, a reduction of plasma glucose levels leads to hyperopic refractive changes, and hyperglycaemia causes variations in the refractive index of the lens while for long-term changes, hyperglycaemia led to the development of myopia, while relative hypoglycaemia, with respect to the initial hyperglycaemia state, led to hyperopic changes.

In addition, diabetic patients experience vitreous degeneration sooner because hyperglycaemia may have a direct role in vitreous pathology by altering the structure