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## **DIABETIC FOOT ULCER PREVENTION THROUGH WORKPLACE WELLNESS PROGRAMS: CONCEPTUAL PERSPECTIVE**

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### **ABSTRACT**

Diabetes Mellitus is one of non-communicable disease (NCDs) and is a major public health problem in Malaysia, especially type 2 diabetes. International Diabetes Federation in 2019 reported, 463 million people infected with diabetes, projected to infect 578 million and 700 million of people by the year 2030 to 2045. One of the complications from DM were Diabetic Neuropathy, a nerve damage that can causes numbness, pain, and weakness, especially in the legs and feet. Diabetes Foot Ulcers (DFU) are a major complication in DM patients. Diabetic foot ulceration is a devastating complication of diabetes that is associated with infection, amputation, and death, and is affecting increasing numbers of patients with diabetes mellitus. Thus, this paper explores the conceptual framework for preventing DFUs through workplace wellness programs, emphasizing the integration of health education, risk factor management, and supportive environments. Workplace wellness initiatives can play a crucial role in educating employees about foot care practices, encouraging regular foot inspections, and promoting appropriate footwear. Key strategies include continuous education on glycemic control, lifestyle modifications, and the importance of early intervention for risk factors such as peripheral neuropathy and vascular disease. By fostering a culture of health and wellness in the workplace, organizations can significantly reduce the incidence of DFUs and improve overall employee health outcomes.

**Keywords:** Diabetic foot ulcer, non-communicable diseases, prevention, wellness program, lifestyle.

## INTRODUCTION

Diabetes is a health problem that has spread in all countries regardless of the race and geography of a society. According to the 2020 World Health Organization (WHO) annual report, there will be 422 million people worldwide suffering from diabetes by 2022. This figure continues to rise from year to year as new estimates are made. The prevalence among adults by age recorded an increase from 4.7% in 1980 to 8.5% in 2014. For low- and middle-income countries showed the greatest increase compared to high income countries (World Health Organization 2023).

The International Diabetes Federation (IDF 2017) has stated that 1.1 million children and adolescents between the ages of 14 and 19 have type 1 diabetes mellitus (1) (DMT1). By 2045, at least 629 million people will have diabetes, if no control measures are taken to control blood glucose to reduce the increase in diabetes complications. According to the World Health Organization (WHO 2020), 4 million people die from high blood glucose levels each year and the International Diabetes Federation (IDF, 2017) estimates that the cost of diabetes care for adults worldwide is US\$ 850 billion by 2020.

Type 2 diabetes is one of the most dangerous diseases if treatment and prevention of complications are neglected as studies conducted by the International Diabetes Federation estimate that 463 million people have diabetes. The number of patients is estimated to rise to 578 million by 2030 and will reach 700 by 2045 (Saeedi et al., 2019). On average, two-thirds of those diagnosed with diabetes live in urban areas and three out of four are adults. It is estimated that more than four million people between the ages of 20 and 79 will have complications and cause deaths. It is because blood sugar control is getting worse and it's leading to chronic diabetes. Diabetes mellitus (DM) is an inherited disease if preventive measures from the outset are not stressed, and the healthcare system is ignored.

The National Health and Morbidity Survey (NHMS, 2023) has shown that the prevalence of diabetes in Malaysia for the last 5 years is reduced from 18.3% in 2019 to 15.6% in 2023, but has increased for the last 5 years from 11.6% in 2006 to 15.2% in 2011 (Public Health Institute, 2020). In other words, about 2.6 million adults aged 18 and over are now suffering from diabetes. In Malaysia, diabetes mellitus (DM) is an increasingly worrying primary health problem associated with increased rates of preventable premature death, as well as macrovascular and microvascular complications. Among macro-vascular and micro-vascular complications such as heart disease, stroke, end-stage kidney failure, blindness and amputation in any member of the body (Clinical Practice Guideline, 2020). Besides, other problems that can happen to the patient are tooth and gums damage, mental health problems. In addition, having poor or weak blood sugar controls will increase the healing time of DM patients who have foot ulcers as it is one of the most common complications of diabetes. Patients with weak glucose levels are at risk of developing diabetes complications, especially DFU. These DFUs or ulcers can be found in the patient's leg, especially in the plantar area. The most painful ulcer is the foot vein ulcer and the less painful is the arterial ulcer on the toes. Often, this problem is caused by an infection that occurs subsequently into gangrene and requires amputation of dysfunctional limbs and if not cleaned or removed can lead to death. According to National Diabetes Registry Report (2023), diabetics have the highest risk of getting 50% amputations in the lower limbs and other limbs in the first 2 years. The mortality rate is 50 percent in the first three years after a patient's lower limb amputation procedure.

## **DIABETIC FOOT ULCER IN MALAYSIA**

National Health Morbidity Survey (2023) found that, Type 2 Diabetes Mellitus (T2DM) cases in Malaysia has escalated rapidly where 1 in 6 Malaysians were diagnosed with this condition. This statistic translates to approximately 16.7% of the population. Furthermore, recent data from the National Health and Morbidity Survey 2023 reveals that Malaysia has the highest prevalence of diabetes in Southeast Asia, with a notable increase in obesity rates among its population, rising from 50.1% in 2019 to 54.5% in 2023 from 8.3% in 2015 to 9.4% in 2019 and to 15.6% in 2023. Additionally, it tackles the issue of large number of undiagnosed cases and the substantial section of the population that is susceptible to acquiring diabetes. A considerable proportion of persons are ignorant of their diabetes, with a large number remaining undiagnosed.

The latest prevalence data on diabetic foot ulcers (DFUs) in Malaysia indicates that approximately 1.2% of diabetic patients are affected by DFUs, according to the National Diabetes Registry<sup>2</sup>. This figure represents a slight decrease from previous years, where the prevalence was reported at 1.02% in 2023. It is important to note that while the registry captures a lower prevalence, studies suggest that the actual incidence may be higher, with estimates indicating that 15-25% of diabetic patients will experience a foot ulcer at some point in their lives. Additionally, a study conducted in found that the prevalence of patients at risk for developing diabetic foot ulcers was significantly higher at 31.3% among type 2 diabetes mellitus patients attending primary health clinics (Medical Journal Malaysia - October 2020). This highlights the importance of early detection and preventive measures for those at risk. Overall, while the reported prevalence of DFUs among diagnosed diabetic patients is relatively low, the risk factors and those identified as "at risk" underscore the need for enhanced awareness and preventative strategies within the Malaysian healthcare system.

In short, diabetes Mellitus is a worldwide health problem that is becoming more common. It is imperative to adopt a healthier lifestyle, which entails engaging in regular physical activity and maintaining a balanced diet, to effectively manage diabetes. Proper nutrition and consistent physical activity are crucial for managing blood glucose levels and promoting overall well-being. Suggested guidelines entail engaging in at least 150 minutes of physical activity each week and following a diet that is well-balanced in carbohydrates, proteins, and fats. Regularly monitoring one's glucose levels and consistently following prescribed drug regimens are crucial for effectively managing diabetes.

## **PREVENTION THROUGH WORKPLACE WELLNESS PROGRAM**

In Malaysia, the workplace wellness programs initiated by PERKESO (Social Security Organization) has focused on promoting health awareness and early intervention for non-communicable diseases (NCDs) among workers. The initiatives aim to combat the rising prevalence of NCDs, which have significant economic implications, costing the Malaysian economy approximately RM12.88 billion annually due to lost productivity and healthcare costs associated with these diseases. By investing in worker health, PERKESO seeks to enhance overall productivity and reduce the burden of chronic illnesses on the workforce and the economy. These programs reflect a proactive approach by PERKESO to foster a healthier workforce, ultimately benefiting both employees and employers through improved health outcomes and productivity. Some of the initiatives taken are discussed below.

### **PERKESO Health Screening Program (HSP)**

The HSP program was introduced by PERKESO in 2013 with the aims to provide free health screenings to workers for early detection of NCDs, which include heart disease, diabetes, and cancer. The program is designed to raise awareness about health issues and to promote a healthy lifestyle among workers. In 2023, PERKESO's Health Screening Program (HSP) 3.0 was introduced with a more comprehensive scope of health tests. It is an enhance free health screenings designed to promote the early detection of Non-Communicable Diseases (NCDs) among Malaysian workers aged 40 to 59 which includes enhanced health screening services such as mental health assessments and tests for various health conditions, including liver and kidney function, cholesterol levels, and cancer screenings for women. Over 2.2 million PERKESO insured workers are eligible for the free health screenings under HSP 3.0, including those who have previously undergone health screening under the program, which are crucial for identifying health risks early and preventing serious health issues that could lead to invalidity or premature death.

### **SEHATi Corporate Dashboard**

PERKESO has launched SEHATi as a new platform for HSP in 2022 which includes SEHATi Mobile application for PERKESO Insured Person, and SEHATi Portal for HSP Panels. PERKESO also introduced the SEHATi Corporate Dashboard to enable employers to manage health screening for their employees under HSP. Through SEHATi Corporate Dashboard, employers able to obtain the list of eligible employees under HSP, check health screening usage status for each employee, access employees' general health analysis and demography dashboard, and continuous monitoring of employees' health.

### **Activ@Work Challenge**

This initiative encourages employers to promote physical activity among employees to motivate workers to maintain an active lifestyle, even while working from home. Campaign *Tolak Gula* is parts of the Activ@Work Challenge that PERKESO launched to raise awareness about the dangers of sugar consumption. Companies participating in this campaign can earn additional points in the challenge, promoting healthier dietary choices in the workplace

In short, since many NCDs are preventable through better health management, it is suggested that the effort taken by PERKESO should continue as proactive measures in controlling NCDs among workers by guiding employers in setting a different approach towards health, safety, and wellbeing of their workers at work. These efforts are aimed at enabling and boosting healthy activities among workers through their employers to avoid more serious complications that come with very high treatment costs.

## **CONCLUSION**

This paper explores the complexities of diabetes, specifically highlighting the hazards linked to unregulated blood glucose levels, including hypertension, cardiovascular illness, renal dysfunction, vision impairment, and vascular damage. The primary emphasis is on diabetic foot ulcers, which are prevalent and difficult to cure, potentially leading to amputation if not handled properly. The significance of comprehensive therapy, encompassing wound management, regulation of blood glucose levels, making good lifestyle choices, and ensuring patient compliance with treatment programs, is

underscored. Emphasizing proper foot care habits, education, stress management, and the utilization of contemporary dressing procedures are crucial for improving results and reducing problems in diabetic patients. However, conducting regular health screenings is considered crucial for early detection of NCDs including diabetes. With dietary modifications, physical exercise, and lifestyle adjustments helps in reducing incidences of amputation and treatment expenses.

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