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Prevalence of self-reported sleep duration and sleep habits in type 2 diabetes patients in South Trinidad

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Abstract The present study aims to determine the prevalence of self-reported sleep duration and sleep habits and their associated factors in patients with type 2 diabetes in Trinidad. This was a cross-sectional multicenter study. There were 291 patients with type 2 diabetes studied. Sleep habits were assessed using the Epworth Sleepiness Scale (ESS) and the National Health and Nutrition Examination Survey sleep disorder questionnaire. Demographic, anthropometric and biochemical data were also collected. The sample had a mean age of 58.8 years; 66.7% were female. The mean BMI was 28.9 kg/m^2. The prevalence of Excessive Daytime Sleepiness (EDS) was 11.3%. The prevalence of patients with short sleep ($\leqslant$6 h) was 28.5%. The prevalence of patients with poor sleep was 63.9%. Poor sleep was associated with age, intensive anti-diabetic treatment and longer duration of diabetes. Short sleep was associated with intensive anti-diabetic treatment and BMI, while EDS was associated with increased BMI. In a sample of patients with type 2 diabetes, a high prevalence of self-reported sleep duration and unhealthy sleep habits

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was found. There needs to be an increased awareness of sleep conditions in adults with type 2 diabetes by doctors caring for these patients.

1. Introduction

Sleep disorders have been associated with chronic illnesses, mental disorders, restrictions in daily functional capacity, and increases in injury and mortality [1,2]. Excessive daytime sleepiness (EDS), a common condition globally, has been found to be strongly associated with obesity, metabolic syndrome and diabetes, with diabetic patients twice as likely to report EDS as their non-diabetic counterparts [3]. It is also known that sleep-related problems adversely affect metabolic health [4]. Specifically, poor sleep and short sleep have been associated with metabolic syndrome, obesity, type 2 diabetes, hypertension and cardiovascular disease [5,6]. EDS has been shown to be a predictor of severe hypoglycemia [7]. Importantly, EDS is also associated with depression and poorer health-related quality of life (HRQOL) [3,8]. Due to these multiple adverse effects of sleep problems, sleep has become an emerging area of investigation in the area of modifiable factors affecting the management of diabetes.

Most recent International Diabetes Federation data estimate the number of persons with diabetes in the world as 382 million [9]. Trinidad and Tobago ranked sixth in the North American and Caribbean (NAC) region in the number of diabetes cases in 2012. The age-adjusted prevalence of diabetes in Trinidad and Tobago in the 20—79 year age group is 13.9% [9].

There have been no studies, to the knowledge of the researchers in the present study, examining the burden of self-reported sleep duration and sleep habits in patients with type 2 diabetes in the Caribbean. This study aims to determine the prevalence of self-reported sleep duration and sleep habits, and factors associated with these conditions, in clinic patients with type 2 diabetes in South Trinidad. This information is essential for guiding strategies for sleep-related problems prevention and intervention in diabetes patients in this region.

2. Materials and methods

This was a cross-sectional, multicenter study carried out at four governmental health facilities in the South region of Trinidad. All type 2 diabetic patients attending specialist diabetic outpatient clinics over a four-month period in 2013 were invited to participate in this study. During the study period, 291 total patients were eligible for the study and were invited to participate. All eligible patients who were invited agreed to participate, yielding a 100% response rate.

All participants signed an informed consent. Exclusion criteria included: type 1 diabetes, less than 18 years of age, pregnant, or refusal to sign an informed consent form. This study was approved by the Ethics Committee of the South West Regional Health Authority (SWRHA), Trinidad.

2.1. Sleep duration and sleep habits

2.1.1. Measurements

During the office visit, physicians administered the following two existing questionnaires: the Epworth Sleepiness Scale (ESS) and the National Health and Nutrition Examination Survey (NHANES) 2007 Sleep Disorders Questionnaire. The ESS is an eight-item questionnaire that measures subjective sleepiness [10]. An ESS score of >10 indicates the presence of Excessive Daytime Sleepiness (EDS). The NHANES 2007 Sleep Disorders Questionnaire [11] is a 24-item questionnaire that assesses self-reported physician diagnosis of a sleep disorder, functional status outcomes for sleep disorders, quality, and the number of sleep hours per night. Using the answer to the question: ''How much sleep do you usually get at night on weekdays or workdays?'' patients were categorized as having short sleep if they slept less than or equal to 6 h. As it has been done in prior studies using the NHANES questionnaire [12], patients were defined as having poor sleep if they answered ''often'' or ''almost always'' (together defined as 5—30 times a month) to any of the following six questions: (1) In the past month, how often did you have trouble falling asleep? (2) How often did you wake up during the night and had trouble getting back to sleep? (3) How often did you wake up too early in the morning and were unable to get back to sleep? (4) How often did you feel unrested during the day, no matter how many hours of sleep you had? (5) How often did you feel excessively or overly