Evaluation of Sleep Pattern: A Cardio Metabolic Risk of Medical Doctors Practicing in Port Harcourt, Rivers State, Nigeria

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ABSTRACT: Adequate sleep is needed for the overall well-being of individuals, and its deficiency is linked to several cardio metabolic disorders. It is well recognized that many of these cardio metabolic disorders are on the increase globally and locally. Medical doctors who treat others are equally expected to take adequate care of their own health, hence the objective of this paper was to evaluate the sleep pattern of doctors practising in Port Harcourt, Rivers State, Nigeria as a marker of cardio metabolic risk Using appropriate standard techniques after collection of data by self-administered online questionnaires. Results obtained show that approximately 60% of participants reported inadequate sleep due to busy clinical schedules. A high prevalence of insufficient sleep among medical doctors, which can be considered a surrogate marker for increased cardio metabolic risk was recorded in this study. Measures aimed at improving the sleep pattern of doctors are recommended.

It is generally recommended for adults to have a minimum of seven (7) hours of sleep per night on a regular basis for adequate rejuvenation and maintenance of optimal health (Watson *et al.*, 2015). This follows from documented evidence of adverse health outcomes including a range of cardio metabolic risks which have recently been linked to insufficient sleep (Huang and Redline 2019). Cardio metabolic risk refers to a cluster of metabolic and cardiovascular abnormalities, including abdominal obesity, insulin resistance, hypertension, dyslipidemia and atherosclerosis, that predispose individuals to cardiovascular disease (CVD) and type 2 diabetes (Eckel *et al.*, 2005; Kahn R, *et al.*, 2005). The prevalence and impact of these disorders are huge and currently on the increase. According to data released by the World Obesity Federation, the global obesity prevalence has more than tripled between 1975 and 2022. Hence obesity is now currently recognized as one of the most important global public health problems (World Obesity, 2024). In 2024, the NCD Risk Factor Collaboration (NCD-RisC) released reports that estimated that more than one billion people are now living with obesity globally (NCD RisC Collaboration, 2024). Recently in 2023, a systematic analysis reported an increasing prevalence of obesity and documented a pooled estimate of 26% for overweight and 15% for obesity in Nigeria (Ramalan *et al.*, 2023).

The prevalence of Type 2 DM in Nigeria has equally been on a progressive increase. Between 1989 and 1998, its recorded prevalence was 0.8 – 1.43% (Olatunbosun *et al.*, 1998; Erasmus *et al.*, 1989). In 2018, a prevalence of 5.77% was reported in a systematic review (Uloko *et al*., 2018), .and a prevalence of 10.0% was documented in 2022 (Cookey *et al.*, 2022).

Sleep deficiencies result in circadian disruption and contribute to weight gain, obesity, and type 2 diabetes potentially by altering timing and amount of food intake, disrupting energy balance, inflammation, impairing glucose tolerance and insulin sensitivity. A number of metabolites involved in energy metabolism, like ghrelin, leptin, Peptide YY, glucose, insulin, glucocorticoids, catecholamines, fatty acids, triglycerides are regulated by sleep and biological rhythms, and so it becomes reasonable that insufficient sleep and circadian disruption contribute to the development of these metabolic disorders (Depner *et al.*, 2014). Other metabolic dysfunction associated with insufficient sleep may manifest as increased inflammation (Atrooz; Salim, 2020) oxidative stress (Atrooz; Salim, 2020; Davinelli *et al.*, 2024), depression Al-Abri, (2015); Babson *et al.*, (2010) and anxiety Babson *et al.*, (2010).

Knutson (2010) in her paper noted that apart from diet and physical activity, reduced sleep duration and quality could be an additional possible reason for the large increase seen in the prevalence of cardio metabolic diseases. Efforts to reduce the increasing prevalence of these disorders need an adequate understanding of the underlying mechanisms. It has been generally acknowledged that the aetiology of many of these disorders comprise both genetic and environmental factors. The genetic components can be considered to a large extent unmodifiable, but the environmental factors are largely modifiable. A good number of research have been conducted on some modifiable risk factors like diet, physical activities, body weight, but sleep deficiency which is a simple but fundamental factor has largely been under-researched, especially in Nigeria. The association of sleep with cardio metabolic risks have been documented for more than a decade, but presently only a few studies have focused on this among medical doctors in Nigeria.

A number of studies assessing sleep quality conducted in Nigeria have focused more on patients Olanisun, (2017); Oseni *et al.*, (2024); Adejumo *et al.*, (2023); Ojelere *et al*., (2019); Adeoye, 2024; Asibong *et al.*, 2021), undergraduates and adolescents (Oluwole, 2010; Aderinto *et al.*, 2024; Sanya *et al*, 2009; Peter *et al.*, 2017; Olorunmoteni *et al.*, 2024), and only a few on medical doctors (Ogunsemi *et al.*, 2019; Aliyu *et al.*, 2018).

Therefore, the objective of this paper was to evaluate the sleep pattern of medical doctors practicing in Port Harcourt, Rivers State, Nigeria

MATERIALS AND METHODS
Study Area. This study was carried out in Port Harcourt, Rivers State, Nigeria. The state is found in the South-South geopolitical zone of the country. It has two tertiary hospitals and several secondary and primary health centres.

Study design: It was a cross-sectional descriptive study, involving medical doctors in Rivers State. This is part of a larger research.

Sample population was all the medical doctors working in Port Harcourt.
Inclusion point of reference was all medical doctors working within Port Harcourt and willing to participate in the study. Exclusion point was medical doctors working outside Port Harcourt and those not willing to participate in the study.

Sample size necessary was obtained using the Cochrane formula, which gave a sample size of 173. One hundred and seventy-three (173) was therefore considered the minimum sample size required for the study.

The *Study instrument* was an online self-administered researcher-designed structured questionnaire. This was used to collect data from respondents with closed questions and a set of predefined answers.

Data analysis was carried out with SPSS version 23. This was after the raw data was entered into a MS excel sheet and exported to SPSS. Results were presented using averages, percentages, summations and charts.

Ethical approval was obtained from the ethical committee of the University of Port Harcourt Teaching Hospital.

RESULTS AND DISCUSSIONS
In total 201 medical doctors responded to the questionnaire. Out of these, one hundred and ten were females while ninety-one were males. (Figure 1). The respondents were from different strata of medical practise and the sub classification is as shown in Figure 2. Most of the respondents agreed that adequate

sleep was necessary for optimum health. (Figure 3) Over 75% were aware that an adult should sleep for at least 7 hours (figure 4) yet over sixty -one percent (61.2%) did not have enough sleep (Figure 5). Lack of time was identified as a reason for inadequate sleep, rest and leisure by over a third of respondents 38.8%.
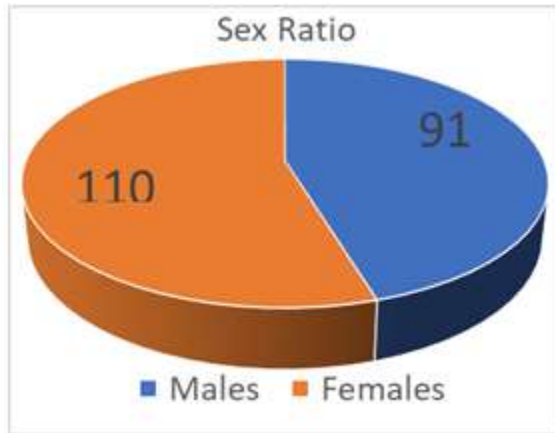
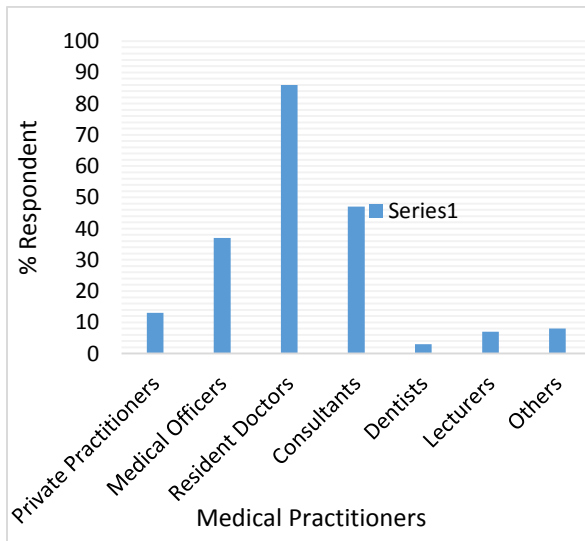

Fig 1. Sex distribution of participants.

Fig 2. Subcategories of respondents**.**

The present study explored the sleep pattern of doctors in the study area as a surrogate marker of cardio metabolic risk. One of the findings is the greater number of female participants over their male counterparts. Historically medicine has been considered a male-predominant field with males being more in number both in medical schools and in specialised training. This narrative is however changing with more and more females enrolling into medical schools and graduating to become doctors. This finding is corroborated in some previous studies reporting higher numbers of female medical doctors

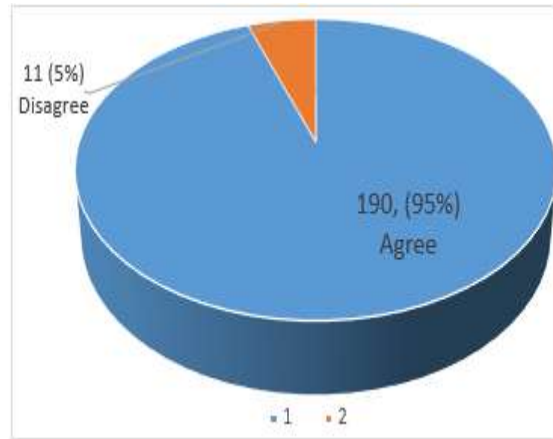than their male counterparts (Steiner-Hofbauer *et al.*, 2023; Okunlola *et al.*, 2020).

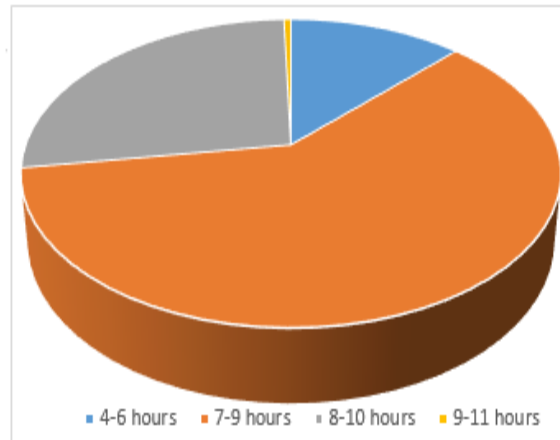**Fig 3**. Response to the question, 'Is adequate sleep necessary for optimum health?'

Fig 4. Participant's response to 'knowledge of recommended amount of sleep required by an adult'
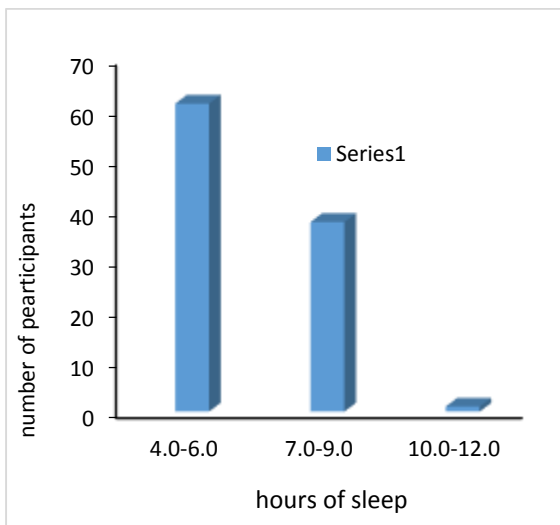

Fig 5. Average daily sleep hours of participants

Most of the respondents were aware that adequate sleep is necessary for good health. This level of awareness is expected as medical doctors have received some trainings on health and wellness. Majority of the respondents also were aware that adequate sleep for an adult was 7-9 hours a day.

Interestingly, in sharp contrast to this level of awareness, about three-fifths of the respondents had inadequate sleep as they reported less than 6 hours of sleep on a regular basis. This shows that the acquired knowledge did not necessarily translate to practice. This finding is higher than the 36.8% reported in South West Nigeria (Ogunsemi *et al.*, 2019), and lower than 100% reported in Kebbi State, North West, Nigeria (Aliyu *et al.*, 2018). The South West study was carried out among conference attendees, while the North West study was done in a semi-urban setting. This among other factors like differences in specialties, cadre, peculiar workloads in different health institutions, number of work years and personal engagements may account for the differences seen in the results. Outside Nigeria, the picture is not different as a study in India (Hafeeq *et al.*, 2018) reported poor sleep in 34.8% of private practitioners, while 59.3% was reported in Canada (Melo *et al.*, 2016).

Despite the different proportions of doctors who reported poor sleep in the different studies, available evidence suggests that poor sleep is highly prevalent among doctors. The demanding schedules of medical doctors coupled with long working hours is usually accompanied with significant stress and oftentimes affect their sleep pattern as they try to balance the ever-increasing workload with personal responsibilities.

Medical doctors are trained to save lives but in the course of their practice, must not neglect their own lives. Poor sleep has recently been associated with some cardio metabolic pathologies such as diabetes mellitus, hypertension, metabolic syndrome, obesity and atherosclerosis ((Huang; Redline, 2019). Beyond these, other disorders like oxidative stress, inflammation and depression have equally been linked to sleep deprivation. Medical doctors being humans can be at risk of these disorders when they are exposed to the risk factors which include sleep deprivation.

It is probably the recognition of this humanness/being human of medical doctors that a section of the amended Physicians' oath accepted by the World Medical Association in 2017 currently reads, 'I will attend to my own health, well-being and abilities in order to provide care of the highest standard'(Parsa-Parsi, 2017) This pledge of self-care seeks to inculcate into medical doctors the critical need to take care of

their own health to ensure that they are able to provide optimum care to patients, colleagues and society at large. It essentially urges medical doctors to take their own health seriously with the same devotion and intentionality that they apply to patients. Recognition of this self-care need will help medical doctors integrate a balance between professional and personal life and specifically cultivate a good sleep habit, so as to avoid these untoward repercussions of poor self-care.

It is not rocket science to know that the state of the medical doctor's health invariably impacts on the patient's health. A well rejuvenated medical doctor will put in his/her best to managing a patient, but a physically and/or mentally drained medical doctor is not likely to do same. The often-reported fallout of this are faulty medical decisions (Papp *et al.*, 2004; Landrigan *et al.*, 2004).

Recommendations for improving the sleep quality of medical doctors and thus ameliorate the related cardio metabolic risks include; Education of medical doctors on work-stress management, regular health checks on medical doctors, encouraging medical doctors to consciously embark on stress-relieving measures, medical doctors' work schedule should be modified to ensure that medical doctors do not work long hours for protracted periods of time, education on good sleep hygiene, and reduced intake of sleep-disruptive substances.

Conclusion: This study recorded a high prevalence of insufficient sleep among medical doctors, which can be considered a surrogate marker for increased cardio metabolic risk. All stakeholders in healthcare need to jointly make efforts in terms of policies, education and awareness creation of the dangers of this trend of sleep deficiency among doctors. Medical doctors themselves ought to practice self-care in order to maintain optimal health needed to give the best care to their patients.

Conflict of Interest: The authors declare no conflict of interest.

Data Availability Statement: Data is available upon request from the first and corresponding author upon request.

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