Prevalence of overweight and obesity among doctors in Brunei Darussalam

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ABSTRACT

Introduction: Obesity is one of the most strongly associated risk factors linked to Non-Communicable Diseases (NCDs). Studies have shown associations between doctors' body mass index (BMI) and effectiveness of health advice given to patients. This study aimed to estimate the prevalence of overweight and obesity in doctors working in Brunei Darussalam as there is currently no published data available on this population group. Comparisons were also assessed between different groups of doctors. **Materials and Methods:** This was a cross-sectional study with data obtained from doctors' occupational health records. Demographic characteristics and BMI were recorded. BMI were categorised according to the World Health Organisation classification; Underweight (<18.5 kg/m^2), Normal (18.6 to 24.9) Overweight (25.0 to 29.9) and Obesity (>30.0). Chi-squared test and regression analysis were used to analyse the differences in prevalence among different doctor groups. **Results:** Out of 431 doctors, 160 (37.1%) were categorised as overweight and 73 (16.9%) categorised as obese. There were significant differences between the genders (p<0.001), ethnic (p<0.001), and those with and without chronic disease (p<0.001). There were no significant difference between age groups (p=0.065), and places of work (p=0.293). Multinomial logistic regression analysis showed: overweight was more likely among male doctors (p=0.005), and less likely among Malay doctors (p=0.003*)*. Obesity was less likely among Chinese doctors (p=0.041), and more likely in those on treatment for chronic diseases (p<0.001). **Conclusion:** Prevalence of overweight was similar to the local civil servant population. The prevalence of obesity was lower than the general and civil servant populations in Brunei Darussalam. There were significant differences in the prevalence of overweight and obesity between the different groups of doctors. Further studies should investigate factors causing these differences. Appropriate interventions could be implemented to improve the BMI of doctors.

Keywords: Doctors, health workers, overweight, obesity, Brunei Darussalam

INTRODUCTION

Non-communicable diseases (NCDs) are the leading causes of morbidity and mortality in many parts of the world. [1] This has resulted in economic implications where limited health care resources have had to bear the increasing burden of rising costs associated with NCDs. [2, 3] From 2009 to 2015 in Brunei Darussalam, the leading causes of mortality have all been due to NCDs. [4] Obesity is one of the most strongly associated risk factors linked to NCDs such as diabetes and cardiovascular disease. [2, 3] In 2011, the prevalence of obesity in Brunei's population was reported as 27.2%. [5] As such, one of the targets of the Ministry of Health is to reduce the proportion

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of obesity within the population. [6]

The management of obesity is a multidisciplinary task. Clinicians play an important role by providing evidence-based advice to their patients regarding health risks associated with excess weight and recommending measures to reduce them. In a systematic review and meta-analysis, primary care providers' advice appeared to have a significant positive impact on patients' attempts to change behaviours related to their weight. [7] Studies have shown that patients may be less trusting towards overweight physicians when compared to normal weight physicians and this would negatively affect patients' inclination to follow medical advice. [8] In addition, physicians who are overweight are less likely to engage their obese patients in weight loss discussions compared to their normal weight counterparts. [9] This was also reflected by a recent local study which found that overweight general practitioners claimed they were more uncomfortable when examining obese patients. [10]

A study in the United States showed that 30% of doctors were overweight at the beginning of residency which increased to 49% at the end of their third year residency. [11] Regionally, in Thailand, results found that almost 30% of the health workers were overweight or obese. [12]

To date, there has been no studies have been published for health workers in Brunei Darussalam. However a health screening programme amongst civil servants in Brunei reported 38% as overweight and another 28% as obese. [13] The aim of this study was to estimate the prevalence of overweight and obesity amongst doctors in Brunei Darussalam. It also aimed to compare the prevalence between different groups of doctors in an attempt to explore possible factors that may be associated with overweight and obesity. It was also of strong occupational health interest because quantitative data from this study on prevalence and associated factors may help promote positive health interventions for this population. Furthermore, it is hoped that data from this study will act as a baseline for future research.

MATERIALS AND METHODS

Study design and population: This was a cross-sectional study using data from the records available at the Occupational Health Division (OHD), Ministry of Health. Included in the study were all doctors (from both government and private sectors) who had undergone the medical fitness examination from January 2011 to December 2013 (inclusive). No sampling was used as all eligible subjects were included. Excluded from the study were those with missing data for body mass index (BMI) and without any height or weight data available.

As part of the Brunei Medical Board requirements for doctors to obtain their license to practice, all doctors are required to have a medical fitness examination every three years at the OHD, Ministry of Health. The medical fitness examination screens for a series of measurements including weight, height and BMI.

Data collection: OHD staff identified all doctors that were seen in the OHD within the specified dates. All eligible records were included in the study and the staff helped obtain the details that were required from the records. Data was anonymised and then recorded by the author.

The following details were recorded directly into the IBM SPSS Statistics program. [14] Age, gender, ethnicity, place of work, treatment for chronic disease and BMI. Age was arbitrarily categorised as less than 40 years or 40 years and above. Ethnicity was grouped into Malay, Chinese, other ASEAN (South-East Asian Nationals), other Asian, and others.

The place of work was defined as hospital or community. Those on treatment for chronic disease was specified as taking regular medication for diabetes, dyslipidaemia or hypertension only. BMI was subdivided according to the World Health Organisation classification: normal <25, overweight ≥25.0, obese ≥30. [15, 16] Data recorded remained anonymous with no means of identifying any individual. Data was also password protected.

Statistical analysis: The IBM SPSS Statistics programme [14] was used to analyse the results. The Pearson chi-squared test was used to compare the overall difference in prevalence between groups. Additionally, multinomial logistic regression analysis was used to compare prevalence between specific subgroups where significant difference was found by the Pearson chi-squared test.

Ethical considerations: This study received ethical approval by the University Research Ethics Committee of Universiti Brunei Darussalam and official permission was given by the Ministry of Health Brunei Darussalam.

RESULTS

Out of a total of 505 doctors that met the inclusion criteria, one was excluded because it was a duplicate and 73 (35 male and 38 female) were excluded because no BMI, height or weight were recorded. The subjects demographics are shown in Table 1.

Table 1: Characteristics of subjects (N=431).

Characteristics	n (%)	Mean (SD)
Age		43.99 (11.35)
<40 years	179 (41.5)	
≥40 years	252 (58.5)	
Gender		
Male	240 (55.7)	
Female	191 (44.3)	
Ethnicity		
Malay	97 (22.5)	
Chinese	41 (9.5)	
Other ASEAN	74 (17.2)	
Other Asian	219 (50.8)	
Others	0 (0.0)	
Place of work		
Hospital	310 (71.9)	
Community	107 (24.8)	
Unstated	14 (3.2)	
On treatment for chronic disease		
No	336 (78.0)	
Yes	95 (22.0)	

The mean BMI was 25.92 kg/m^2 (SD 4.46). The prevalence of overweight and obesity if shown in Figure 1.

Pearson chi-squared test as shown in table II showed there were statistically significant differences of prevalence between normal weight, overweight and obesity between different genders (p<0.001), ethnicities (p<0.001) and with or without chronic disease (p<0.001). Prevalence of overweight and obesity in males were 46.7% and 14.2% respectively compared to 25.1% and 20.4% in females respectively.

Pearson chi-squared test as shown in Table 2 showed there were statistically significant differences between normal weight, overweight and obesity between different genders (p<0.001), ethnicities (p<0.001) and with or without chronic disease (p<0.001). The prevalence of overweight and obesity in males were 46.7% and 14.2% respectively compared to 25.1% and 20.4% in females respec-

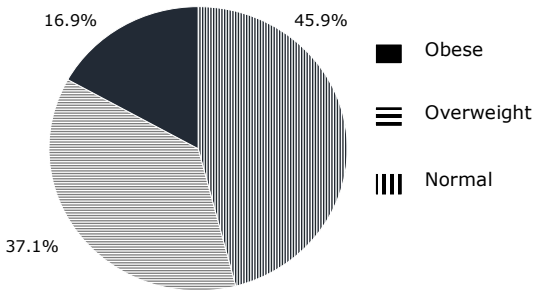

Fig. 1: Breakdown of weight distributions.

Table 2: Association of the various variables with weight disorders.

	BMI category				χ2 (*p*-value)
	Normal n (%)	**Overweight** n (%)	**Obese** n (%)	**Total** N (%)	
Age group (years)					5.482 (0.065)
<40	94 (52.5)	57 (31.8)	28 (15.6)	179 (41.5)	
≥40	104 (41.3)	103 (40.9)	45 (17.9)	252 (58.5)	
Gender					21.150 (<0.001)
Male	94 (39.2)	112 (46.7)	34 (14.2)	240 (55.7)	
Female	104 (54.5)	48 (25.1)	39 (20.4)	191 (44.3)	
Ethnicity					25.614 (<0.001)
Malay	52 (53.6)	20 (20.6)	25 (25.8)	97 (22.5)	
Chinese	24 (58.5)	16 (39.0)	1 (2.4)	41 (9.5)	
Other ASEAN	37 (50.0)	27 (36.5)	10 (13.5)	74 (17.2)	
Other Asian	85 (38.8)	97 (44.3)	37 (16.9)	219 (50.8)	
Place of work					2.453 (0.293)
Hospital	148 (47.7)	114 (36.8)	48 (15.5)	310 (74.3)	
Community	44 (41.1)	40 (37.4)	23 (21.5)	107 (25.7)	
On treatment for chronic disease					18.251 (<0.001)
No	172 (51.2)	116 (34.5)	48 (14.3)	336 (78.0)	
Yes	26 (27.4)	44 (46.3)	25 (26.3)	95 (22.0)	
Expected count percentage	(45.9)	(37.1)	(16.9)		

tively. Amongst the different ethnicities, the prevalence of overweight was greatest in the Other Asian group (44.3%) and the prevalence of obesity was greatest in the Malay group (25.8%). The prevalence of overweight (46.3%) and obesity (26.3%) were both greater in the group on treatment for chronic disease when compared to those without (34.5% and 14.3% respectively). There was no statistically significant difference between age groups (p=0.065) and places of work (p=0.293).

Multinomial logistic regression analysis has been summarised in Table 3. Males were statistically significantly more likely to be overweight compared to females (p=0.005). Malays were statistically significantly least likely to be overweight (p=0.030). Chinese and other ASEANs were also less likely to be overweight but these were not statistically significant (p=0.520 and p=0.633 respectively). Those not on treatment for chronic disease were less likely to be overweight but this was not statistically significant (p=0.190).

With regards to obesity, males were less likely to be obese compared to females but this was not statistically significant (p=0.317). Chinese were statistically significantly least likely to be obese (p=0.041). Malays were more likely to be obese and other ASEANs were less likely to be obese but these were not statistically significant (p=0.544 and p=0.215 respectively). Those not on treatment for chronic disease were statistically significantly less likely to be obese (p=0.000).

DISCUSSIONS

The results of our study showed that the prevalence of overweight in doctors (37.1%) was similar to the prevalence of overweight in the civil servant population (38%). The prevalence of obesity in doctors (16.9%) was lower than the general population (27.2%) and the

Table 3: Logistic regression analyses.

BMI category [a]		Coefficient	Odds ratio	Significance value
Over-weight	Intercept	0.100		0.767
	Male	0.690	1.995	0.005
	Female	0[b]		
	Malay	-0.698	0.498	0.030
	Chinese	-0.238	0.788	0.520
	Other ASEAN	-0.149	0.862	0.633
	Other Asian	0[b]		
	No treatment	-0.669	0.512	0.190
	On treatment	0[b]		
Obesity	Intercept	0.277		0.483
	Male	-0.317	0.728	0.317
	Female	0[b]		
	Malay	0.211	1.235	0.544
	Chinese	-2.138	0.118	0.041
	Other ASEAN	-0.540	0.583	0.215
	Other Asian	0[b]		
	No treatment	-1.289	0.276	0.000
	On treatment	0[b]		

civil servant population (28%). [5, 13]

The higher prevalence of obesity among female doctors (20.4%) reflects worldwide trends of higher prevalence of obesity in women compared to men. However the significantly higher likelihood of overweight among male doctors (46.7%) compared to female doctors (25.1%) is different to the worldwide trend where there is no difference between genders. [17]

In this study, across the different ethnic groups, overweight was found to be significantly less likely among Malays and obesity was significantly less likely among Chinese. Such findings on ethnic differences have been shown in other studies and were associated with both genetics and lifestyle factors. [18, 19] Different groups also have different accepted norms with regard to body habitus. [20, 21]

This study found that those who were already on treatment for chronic disease were associated obesity. It is possible that obesity was one of the factors leading to chronic disease that required treatment in the first place. [2, 3] There was no significant difference of overweight between these groups.

The results also showed no significant difference between the two age groups which was unexpected since other studies have shown that BMI tends to progressively increase up to the age of 60 years. [22] This study did not find any significant difference in overweight or obesity prevalence between hospital and community doctors. Shift work which is usually more common in hospital doctors has been associated with obesity in previous studies. [23] Further studies should be considered to explore this factor in the local setting.

The author identified a number of limitations to the study. In this case, 73 of the doctors with missing values for BMI (with no height or weight data) were not included in the study. There may have been further missing data because some may have had the medical fitness examination done only just outside the dates specified by the inclusion criteria. The data which was collected retrospectively represented values over a three year period which may not reflect the most current values. Some doctors may have also since retired or left clinical practice. Only data prior to 2014 was chosen to be collected because the author wanted to collect data prior to the introduction of the electronic care records system in the OHD which started in 2014.

The three-yearly medical fitness examination for doctors provides a great opportunity to provide periodic health screening to doctors as part of workplace health promotion. [24] The study captured anthropometric measurement of the BMI status of the majority of doctors in the country. It provides a

good indication on the nutritional and metabolic status of the doctors which can act as a basis for any workplace health promotion strategy to improve the health of doctors. There have been some positive findings from studies looking at health promotion and health interventions at work leading to increased productivity, less sickness absence and improved well-being. [25] Furthermore, improving the BMI of doctors may result in better management of obese patients. [7-10]

Although systematic reviews have not found evidence that any particular national public health initiative have resulted in statistically significant effective reduction in the prevalence of obesity, [26, 27] health promotion remains a continued effort because certain health interventions do help many obese people achieve weight loss. [28] In Singapore, an intervention promoting healthy lifestyle was introduced at a school level and led to some success. [29] Recently in Brunei Darussalam, the government initiative of a weight loss programme for obese patients, showed statistically significant weight loss as well as a reduction of other cardiovascular risk factors. [30]

Further research would be useful to find out other factors that may contribute toward overweight or obesity in this group of subjects, especially between the different ethnicities. Other potential areas of study would be workplace issues that surround doctors, namely: working out-of-hours, long shifts, other responsibilities including life-and-death situations, and highly stressful environments. The impact of these factors upon the ability of doctors to sustain a healthy lifestyle can then be researched.

In conclusion, our study showed that the prevalence of overweight in doctors is similar to Brunei's civil servants population. However, the prevalence of obesity in doctors was lower than Brunei's civil servants population as well as the general population. Amongst the different groups, overweight was more likely in male doctors, and obesity was most likely in those on treatment for chronic disease. Conversely, overweight was least likely in Malay doctors, and obesity was least likely in Chinese doctors.

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