Review Article

Prevalence of Overweight and Obesity Among Medical students Across Indonesia: Literature Review

ABSTRACT

Aim: To make profiling of the prevalence of overweight and obesity among medical students in Indonesia through a literature search on previous scientific publications in the internet, then creating a map showing the spread of this silent epidemic among medical students.

Methodology: Simple internet based literature study cross sectionally search for previous published scientific articles available only on the internet, regarding overweight or obesity among medical students from different faculty of medicine in Indonesia. This study conducted from January to March 2023. Using famous search engine, Google™, we type several keywords regarding overweight and obesity among medical students in Indonesia

Result and discussion: Data from 29 published articles obtained electronically. The mean percentage of overweight and obese students is 35.5% and found in both public or private medical schools; where private schools have a slightly higher mean percentage of prevalence than the public ones. Even though there are 92 medical schools across Indonesia, it turns out that not all have such data uploaded to the internet. From the health communication perspective, this is also barriers that must be overcome.

Conclusion: Overweight and obesity among medical students of Indonesia is a real problem that must be managed properly in order to ensure that, these students stay healthy, can complete their education and then become doctors who serve the community

Keywords: anatomy, body mass index, body image, waist circumference, public, private, health communication

1. INTRODUCTION

The incidence of overweight and obesity has increased rapidly during recent decades [1]. It affects his/her anatomy and physiology directly; and further also might influences his/her personal perception and possibly also other people's regarding his/her body image, The number of obese children and adolescents (aged five to 19 years) worldwide has risen tenfold in the past four decades. [1] Overweight and obesity could reflect an energy imbalance which there is an increase in the consumption of energy-dense foods [2], especially highly processed carbohydrates (refined carbs) [3], which lead to weight gain [4] and poor lifelong health outcomes. [5] Overweight and obesity are associated with unhealthy lifestyle, at any age [6,7] and increases the risk of several debilitating, and deadly diseases, e.g., dyslipidemia [8], diabetes [9], cardiovascular disease,[10,11] stroke,[12] and even

certain types of cancers [13] and its survival outcomes due to cancer also influenced by the presence or absence of obesity. [14]

An individual is considered overweight if her/his body mass index (BMI) is 25-29.9, and obese if BMI is over 30. [15] Overweight and obesity is a true personal and public health problem, and if taken into a wider perspective also being a huge population-based policy problem [16] because of its increasing incidence,[17] expenditures,[18] stigma and discrimination [19] and health effects. [5,8-14] The dynamics of life in a certain community, [20] especially in urban areas, [21] affect the incidence of overweight and obese.

Regarding the specificity of a certain population, obesity and overweight also varies in number, based on the singularity of that specific population. [22] To our concerns, medical students as specific population are also part of a general community that has its own uniqueness. Usually, they come from families with a strong financial background and perhaps have been accustomed to consuming excess amounts of nutritious food since childhood. As an addition to that background, the dynamics of medical education which are tough, expensive and take a long time to finish; for example, education and examination periods for pre-clinical students and clinical rotation periods with night shifts at the hospital/public health center for clinical students that surely affect their sleep quality. This becomes a primary stress factor that exacerbates eating behavior. Also the existence of non-educational challenges such as personal social life, e.g. parental/family/community high expectations, which adds to the burden that makes him/her more permissive to excessive eating. Besides, there is a possibility, they do not have sufficient choices of healthy food during his/her educational dynamics, for example during night shift in their clinical rotation.

The report on prevalence of overweight and obesity among medical students was sporadic, globally, regionally and locally; what has been reported looks more like an iceberg phenomenon. This is unfortunate because so much high hope is placed on this specific population. In the context of Indonesia, what is sometimes forgotten is that medical education is not only rely on the role of parents in a financial context, but also medical faculties as educational institution which are bound by strict regulations outlined by the government, for example the maximum number of students that can be accepted each year based on the results of institutional accreditation. Another worrying fact is that, even at this time, Indonesia still lacks 130,000 doctors to meet the ideal ratio of doctors: population; [23] while maximum in a year, the faculty of medicine in Indonesia can only produce maximum 12000 doctors per year; so it took at least 11 years to catch up to the normal ratio.[24] That is why there is very high expectation for medical students so that they will stay healthy and be able to serve the people who need their services immediately after completing their education.

The aim of this study is to make profile of the prevalence of overweight and obesity among medical students in Indonesia through a literature search on previous scientific publications in the internet, then putting some numbers on an existing map of Indonesia showing the spread of this silent epidemic among medical students.

2. METHODOLOGY

This simple internet based literature study cross sectionally search for previous published scientific articles available on the internet regarding overweight or obesity among medical students from different faculty of medicine in Indonesia. This study conducted from January to March 2023. Using famous search engine, Google™, we type the sentence “Prevalence of Overweight and Obesity among medical students in Indonesia”, “Incidence of Overweight

Obesity in Indonesia medical student", "Prevalensi Overweight dan Obesitas mahasiswa kedokteran Indonesia", "Insidens Overweight dan Obesitas mahasiswa kedokteran Indonesia", Overweight dan Obesitas pada mahasiswa kedokteran Indonesia" and "Overweight dan Obesitas dikalangan mahasiswa fakultas kedokteran di Indonesia". We used combination of both English and bahasa when we input the search terms into the search engine in order to expand the horizon of searching. Potential articles that contain the prevalence or incidence or any information regarding overweight and or obesity that match with the inclusion criteria were screened manually and checked carefully. Articles that met our inclusion criteria then given a number, sorted once again, then marked the sections that have data on overweight and obesity, then put the data into the table. Articles that did not meet our inclusion criteria were excluded from the study.

3. RESULTS AND DISCUSSION

This simple study was conducted from January to March 2023. Using electronic literature searching via popular search engine, we managed to collect 57 potential articles, then after carefully screened the number of articles remaining for further analysis were 29 articles.

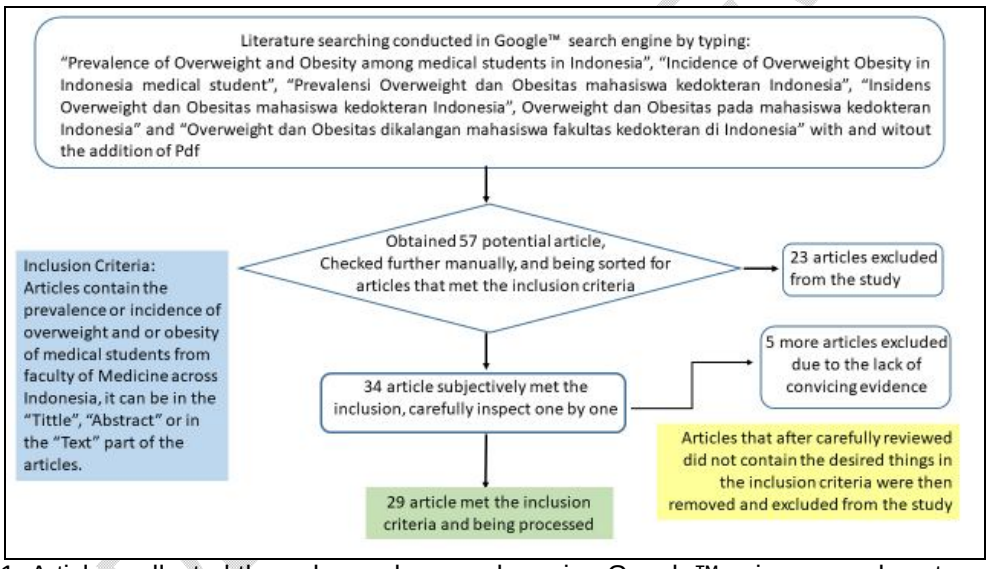

Fig. 1. Articles collected through popular search engine Google™ using several sentences in order to expand the horizon of searching. After potential articles are obtained (n=57), norrowed to 34 articles subjectively. Further carefully screening is conducted using inclusion criteria and a total number of 29 articles meet the inclusion criteria.

Currently, there are currently 92 active institutes of higher education (including both public and Private institutions) that run medical school from all over Indonesia. These provinces Bangka Belitung, North Kalimantan, and West Sulawesi do not have any medical school program on their own province. [25] Unfortunately, even though there are many medical educational institutions in Indonesia (90+), our internet based searching revealed that only some of them have published data regarding students who are overweight or obese.

Table 1. Summary of Prevalence of Overweight and Obesity among Medical Students across Indonesia

No	Author [Ref no] (year)	Location	Med School (Public or Private)	Prevalence of Overweight and Obesity (%)	Detailed description
1	Afdhilah[26] (2012)	Banda Aceh, Aceh	Public	31.6	determination of overweight and obesity based on the criteria of body mass index, waist circumference and neck circumference
2	Lestari [27] (2012)	Medan, North Sumatera	Public	20.01	data anthropometry, nutrient intake and physical activity were analyzed to determine the dominant factors that influence obesity.
3	Irfan [28] (2022)	Medan, North Sumatra	Private	40.8	data regarding consumption patterns of sugary drinks and the incidence of obesity were analyzed to seek for correlation
4	Sinaga [29] (2015)	Pekan Baru, Kepulauan Riau	Public	40.1	the relationship between sleep quality and obesity
5	Halim [30] (2018)	Jambi, Jambi	Public	40	to determine the daily fluid intake and nutritional status
6	Utami [31] (2015)	Palembang, South Sumatra	Private	32.7	Determination of the association of factors (gender, genetic, diet, physical activity) with overweight and obesity
7	Soputra [32] (2018)	Palembang, South Sumatra	Public	23.5	to determine the relationship of obesity and blood uric acid levels
8	Bastha [33] 2022	Bandar Lampung lampung	Public	38.7	to find a relationship between sedentary lifestyle and eating habits and the nutritional status of students during the pandemic.
9	Diani [34] 2018	Jakarta, DKI Jakarta	Private	35.5	to determine the relationship of gender, parental's nutritional status, place of residence status, diet pattern, sleep duration and

					physical activity to the student's obesity condition
10	Andalu [35] (2015)	Jakarta, DKI Jakarta	Public	22.7	to determine whether there is a relationship between coffee consumption mix with central obesity or not.
11	Santoso [36] (2017)	Jakarta, DKI Jakarta	Private	26.1	To find out the prevalence of obesity among medical student using body mass index and waist circumference
12	Azzahra [37] (2020)	Jakarta, DKI Jakarta	Public	58.6	to determine the relation of high body mass index (obesity) and the incidence of flat feet
13	Liwanto [38] (2021)	Jakarta, DKI Jakarta	Private	57.5	to see the relationship between the consumption of sugar intake in soft drinks to the incidence of obesity
14	Monzalitza [39] (2020)	Jakarta, DKI Jakarta	Private	46.8	to assess the relationship between fruit intake and body mass index
15	Noviana [40] (2021)	Bandung, West Java	Private	46.9	To find the correlation between steps and body mass index
16	Djunet [41] (2021)	Yogyakarta, DI. Yogyakarta	Private	31	to determine the student obesity rates after a year of online learning
17	Khotibuddin [42] (2017)	Yogyakarta, DI. Yogyakarta	Private	28.6	To determine the relationship between depression and eating behavior with overweight
18	Adianto [43] (2015)	Surabaya, East Java	Private	38.75	to identify the relationship between stress and obesity
19	Ganakin [44] (2017)	Surabaya, East Java	Private	33.66	to analyze the relation between sleep quality and the condition of obesity
20	Rachmawati [45] (2020)	Malang, East Java	Private	47.5	to examine the association of sleep duration with dietary intake, physical activity and obesity

21	Mahalingam [46] (2016)	Denpasar, Bali	Public	37.3	To determine the prevalence of obesity and factors contributes to obese
22	Cholidah [47] (2020)	Mataram, Nusa Tenggara Barat	Public	13.63	to determine the eating pattern, nutrition adequacy, and nutritional status
23	Purwanti [48] (2017)	Pontianak, West Kalimantan	Public	48.1	to determine the correlation between stress level and body mass index
24	Sari [49] (2021)	Samarinda, East Kalimantan	Public	37.6	to analyze the correlation between body mass index and waist circumference with the quality of sleep
25	Ticoalu [50] (2012)	Manado North Sulawesi	Public	32.2	to find out the prevalence of obesity
26	Sakina [51] (2021)	Palu, Central Sulawesi	Public	44	to describe the determinant factors of vitamin D status according to their nutritional status based on BMI
27	Rajab [52] (2019)	Makassar, South Sulawesi	Public	34.35	To find the prevalence of overweight-obesity
28	Billah [53] (2020)	Makassar, Soulth Sulawesi	Private	19.8	To find the correlation between consumption of fast food with the risk of obesity
29	Ramandei [54] (2022)	Sorong, West Papua	Public	31.8	to determine the relationship between body mass index and grasping strength

Data were collected from only 29 medical faculties, even though to date there are actually 92 medical faculties throughout Indonesia. The highest percentage comes from Azzahra's research [37] in Jakarta in 2020 which has a prevalence of 58.6% and the lowest prevalence (13.63%) obtained from the study conducted by Cholidah [47] in Mataram. Overall, the mean percentage of overweight and obese obtained from the sum of the percentages of each medical school divided by the number of institution (as many as 29) the result is 35.85% (SD 10.73).

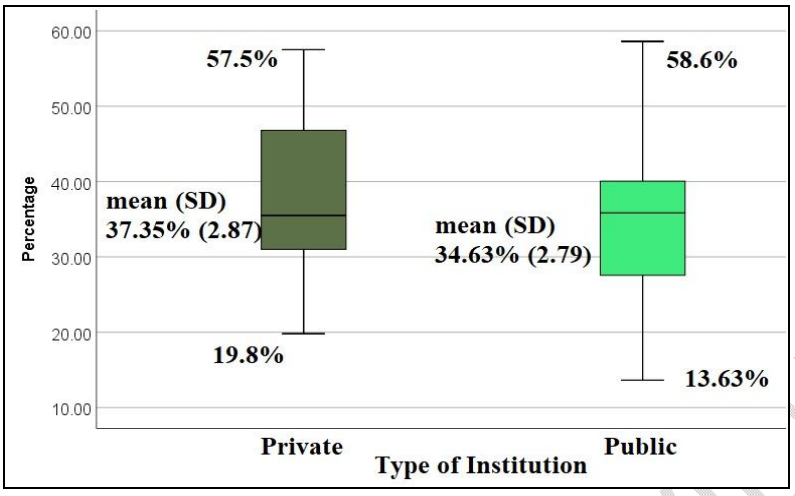

Fig 2. Box plot the difference of percentage of overweight and obesity among private (n=13) vs public (n=16) faculty of medicine (n=29)

The box plot showed in figure 2 revealed that, the mean percentage of overweight and obese students of private faculty of medicine is higher than those from the public institution (37.35% vs 34.63%). This gives us an idea that in a rough way it can be said that the nutritional status of students from private institution is very, very good or even excessive. This makes sense, because in order to enroll into private faculty of medicine requires a lot of money for institutional fees and only wealthy families can accommodate such an enormous cost requirements. Although cases of overweight and obesity are also found in state students; the cause could also be because the student came from a wealthy family or it might also be caused by other things. We have to admit that drawing causal conclusions from incomplete data is actually too naïve; even though Templit et al [55] stated that in low to middle-income countries, the prevalence of overweight and obesity is higher among wealthier individuals than among poorer individuals.

Another aspect of the weakness in this simple cross-sectoral study is that all data obtained from literature searching is of an as-is nature. Perhaps,a more meaningful conclusions can be drawn if students are followed by cohort design along their education period from start to finish. Unfortunately, according to Vogel [56], until nowadays weight gain during medical education is poorly studied. All the five main conditions that take part to emotional eating among medical freshman undergraduates — (1) perceived stress [57], (2) unpredictable schedules [58], (3) lack of sleep [59], (4) physical inactivity [60], (5) unsupportive social interactions [61] — apply to an “augmented degree” in medical school, to their internship and then continue to get worse during their future postgraduate training or specialties.

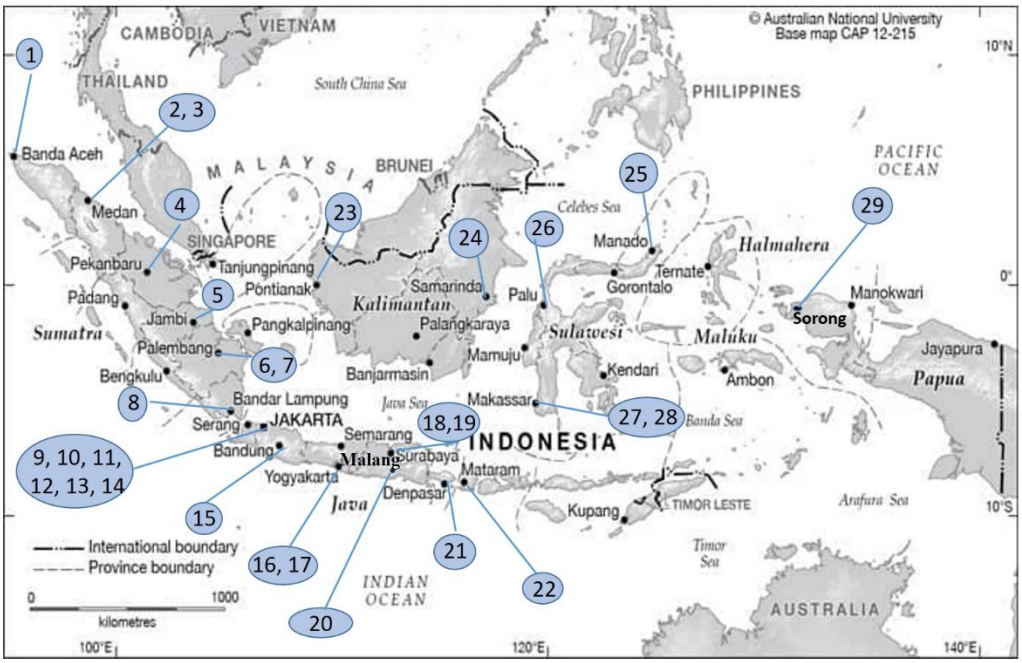

Fig. 3. Map of Indonesia with additional numbers that represent articles in table 1. Those studies were conducted in 19 big cities located in 18 provinces which have faculty of Medicine, some city even have more than one faculty of Medicine. Actually, there are 34 provinces in Indonesia and only 3 provinces (Bangka Belitung, North Kalimantan and West Sulawesi) that do not have any medical school program on their own province.

Figure 3 showed us, that out of 29 publications obtained from the internet, their distribution across Indonesia already sufficiently distributed. Although actually there are still several big cities in Indonesia that have faculties of medicine, state and private, but unfortunately their data is not found on the internet. That could possibly happen because: (1) the search keywords are not sufficient, (2) the data is locked/access is very limited or even (3) data was not uploaded to the internet.

From the health communication perspective, it is very unfortunate that even though there are so many medical faculties in Indonesia, unfortunately not all of the data regarding simple prevalence of overweight and obesity can be accessed easily. This unintentional restriction is probably due to barriers to data sharing that commonly occur in all aspects of data, including health/medicine, ranging from simple tangible issues such as technical aspects, to the more intangible issues such as motivational, economic, political, legal and even ethical [63]. There are potential risks and challenges of data access and sharing; including (1) obstacles to releasing data, (2) privacy and confidentiality problems, and (3) informed-consent issues. It is necessary to carry out system and sectoral improvements, with more intensive communication between all stakeholders so that they can overcome the previously mentioned barriers [64].

Unfortunately, overweight and obesity among medical students across Indonesia is a real problem and that must be carefully managed. Increasing frequency of obesity associated with unhealthy lifestyle needs to be controlled at national level to raise a healthy generation and to reduce the burden on the health economy. Health personnel are important promoters

and role models for maintaining a healthy lifestyle for the general population. From the very beginning of their medical education, they have been taught and trained to practice the spirit of health promotion. The actual investment for them is very large and therefore all stakeholders hope that they can practice a healthy lifestyle since their very early educational period ceaselessly; so that they can continue to be healthy and optimal to serve the people who need their medical services. in this case, the noble values of medicine are practiced.

4. CONCLUSION

A marked proportion of Indonesian medical students were overweight or obese. A variety of factors are implicated as contributing factors to this condition. Achieving the data electronically through the internet is also still a problem. Improvements need to be taken in health communication related to data and also handling cases of obesity and overweight must be managed properly to keep these future doctors continue to be healthy and ready to serve the community.

CONSENT (WHERE EVER APPLICABLE)

Not needed

ETHICAL APPROVAL (WHERE EVER APPLICABLE)

Not needed

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