Jurnal Sains Kesihatan Malaysia 21 (2) 2023: 131 - 83
DOI : http://dx.doi.org/10.17576/JSKM-2023-2102-10

Kertas Asli/*Original Articles*

The Use of Weight Loss Products and Body Mass Index among University Students in Kota Bharu, Kelantan

(Penggunaan Produk Penurunan Berat Badan dan Indeks Jisim Tubuh dalam Kalangan Pelajar Universiti di Kota Bharu, Kelantan)

NURUL IZZATIE IBRAHIM, NURZETTY SOFIA ZAINUDDIN & JULIANA SHAMSUDIN

ABSTRACT

Body mass index (BMI) was one of the reasons people used weight loss products to lose weight. The purpose of this study is to look into the use of weight loss products and their relationship to BMI and associated factors. A cross-sectional study with convenient sampling was conducted on 133 students from Universiti Sains Malaysia, Kubang Kerian (USMKK) Health Campus. Participants were asked to complete an online questionnaire that included sociodemographic information, self-reported weight and height for BMI, weight loss product use, weight loss product usage characteristics, body weight perception and satisfaction, and weight loss product perception. The majority of participants were female (78.2%), 80.5% were Malay, and the mean age was 22 ± 3.1 years old. Majority had a normal BMI (56.4%), whereas 16.5% were underweight, 18.8% were overweight, and 8.3% were obese. Nevertheless, only 10.5% of participants utilised weight loss products. It was discovered that the use of weight loss products is statistically associated with BMI, with a high proportion of users having an overweight or obese BMI (p=0.042). Those who reported using a weight loss product had a higher BMI [25.56 (IQR 6.6) kg/m^2] than those who did not [21.35 (IQR 5.3) kg/m^2] (p = 0.015). The use of weight loss products was also statistically associated with perceived product safety (p=0.041) and body weight dissatisfaction (p=0.011). Universities should therefore provide students with appropriate weight loss advice, up-to-date information on the safety and efficacy of various weight loss products, and opportunities to enhance their knowledge, self-efficacy, and social support. For future research, it is suggested to wider the research population to overweight and obese adults in Kelantan.

Keywords: Body mass index; weight loss products; body weight perception; body weight satisfaction

ABSTRAK

Indeks jisim tubuh (IJT) adalah salah satu sebab penggunaan produk penurunan berat badan. Kajian ini bertujuan untuk mengkaji penggunaan produk penurunan berat badan dan perkaitan dengan IJT serta faktor yang berkaitan. Kajian ini berbentuk keratan rentas menggunakan persampelan mudah melibatkan 133 pelajar Universiti Sains Malaysia, Kubang Kerian (USMKK) Kampus Kesihatan. Peserta dikehendaki menjawab soal selidik dalam talian bagi mendapatkan maklumat sosiodemografi, berat dan tinggi kendiri bagi mendapatkan IJT, penggunaan, ciri-ciri dan faktor menggunakan produk penurunan berat badan, persepsi pengguna terhadap berat badan mereka dan terhadap produk yang diambil. Majoriti peserta adalah perempuan (78.2%), berbangsa Melayu (80.5%), dan purata umur 22 ± 3.1 tahun. Majoriti mempunyai IJT normal (56.4%), manakala 16.5% pula mempunyai IJT kurang berat badan, 18.8% berat badan berlebihan dan 8.3% adalah obes. Namun, hanya 10.5% peserta adalah pengguna produk penurunan berat badan. Terdapat perkaitan yang signifikan antara penggunaan produk penurunan berat badan dengan IJT di mana sebahagian besar pengguna mempunyai IJT yang berlebihan berat badan dan obes (p=0.042). Mereka yang mengambil produk penurunan berat badan dilaporkan mempunyai IJT yang lebih tinggi [25.56 (IQR 6.6) kg/m^2], berbanding dengan mereka yang tidak mengambil produk penurunan berat badan [21.35 (IQR 5.3) kg/m^2] (p = 0.015). Penggunaan produk penurunan berat badan juga didapati mempunyai perkaitan dengan kepercayaan bahawa produk-produk ini

adalah selamat (p = 0.041) dan ketidakpuasan berat badan (p=0.011). Atas dasar ini, universiti harus menyediakan kepada pelajar dengan nasihat penurunan berat badan yang sesuai, maklumat terkini mengenai keselamatan dan keberkesanan pelbagai produk penurunan berat badan, pengetahuan, efikasi diri, dan sokongan sosial. Bagi kajian akan datang, dicadangkan untuk memperluaskan populasi kajian kepada dewasa yang mempunyai berlebihan berat badan dan obes di Kelantan.

Kata kunci: Indeks jisim tubuh; produk penurunan berat badan; persepsi berat badan; kepuasan berat badan

INTRODUCTION

Some people lose weight in order to boost their self-esteem and quality of life by achieving a perfect body figure. Many people are advised by their doctors to lose weight by following traditional diet and exercise plans (Abd Malik, Muhammad & Ali 2019). Obesity is a well-known risk factor for non-communicable diseases such as type 2 diabetes, cardiovascular disease, osteoarthritis, and many cancers (Kilpi et al. 2014). The extent to which people adhere to these methods is also determined by their willingness and motivation to face difficult physical and mental challenges (Abd Malik, Muhammad & Ali 2019).

While these standard weight loss measures are generally difficult to adhere to, weight loss products are marketed as needing less effort than diet restriction and exercise regimens, with claims of efficacy, and are frequently affordable and widely accessible (Lubowiecki-Vikuk, Król-Zielińska & Kantanista 2019). With the rise of social media advertisements and the influence of public figures and celebrities, the popularity of weight loss products has increased (Abd Malik, Muhammad & Ali 2019). Despite their popularity, there is little research to support their efficacy, and they may also pose a number of safety concerns, such as herb-drug interactions or potential toxicity (Watanabe et al. 2020). This is a concern because weight loss products, including dietary supplements, have been linked to a variety of negative side effects adverse such as stroke and other cardiovascular complications especially to people already at risk (Abd Malik, Muhammad & Ali 2019).

According to a study, the primary reasons for adults using weight loss products were aesthetic concerns (63.8%), low self-esteem (48.3%), and the fashion for slim bodies (29.3%) (Kozłowska & Pol 2013). Lubowiecki-Vikuk, Król-Zielińska and Kantanista (2019) reported that 69.5% of adults in Poland who use weight loss products are underweight. In contrast, a study found that 33.9% of American adults who use weight loss products have a higher BMI (Pillitteri et al. 2008). Nevertheless, according to a survey involving 332 participants conducted in overweight and obese patients attending a public primary care clinic in Penang, only 18.7% of overweight and obese patients who visited a local public clinic used weight loss products (Abd Malik, Muhammad & Ali 2019). In the research mentioned earlier, it was indicated that the factors associated with the use of weight loss products were educated [adjOR 2.27 (p=0.02)], working [adjOR 3.42 (p=0.009)], women [adjOR 5.59 (p=0.0001)], who perceive themselves to be overweight [adjOR 3.61 (p=0.05)], use weight loss products and believe they are safe[adjOR 2.48 (p=0.04)]. However, only 7.8% of Malaysian public college students reported ever using weight loss products (Badrin, Daud & Ismail 2018). Variations in outcomes may be attributable to differences in study design, sample size, age group, and cultural values and understanding of the study populations. Furthermore, varied regulations and rules regarding weight loss products used for weight loss can alter the frequency and perception of their use in different nations (Porter Starr & Bales 2015).

Many people are unfamiliar with the terms overweight and obese, as defined by the BMI (Radwan et al. 2019). Some researchers have identified adults' misconceptions about their weight status (Mikolajczyk et al. 2010). Both Both BMI category and weight perceptions were strongly associated with weight loss efforts and weight management behaviour (Park et al. 2019). According to one study involving 18,512 university students in United States and Western Europe, women of all BMI categories, particularly those in the lower BMI deciles, regard themselves as overweight and are attempting to lose weight (Wardle, Haase & Steptoe 2006). Because they are unhappy with their weight and appearance, people who are overweight or underweight are eager to modify their weight.

According to Kim, Lim and Kwak (2008), the percentage of individuals who perceive themselves as overweight is significantly higher than the percentage of individuals who are actually overweight, indicating a more distorted body weight image. People who have a skewed sense of their weight are more prone to engage in severe or unhealthy weight loss behaviours (Park et al. 2019). Women are more likely than men to have a distorted body image and participate in weight-loss behaviours (Park et al. 2019). Erroneous body weight perceptions lead to body weight concerns and can predispose individuals to psychological and behavioural problems, such as depression, bulimia, and anorexia nervosa (Wharton, Adams & Hampl 2008).

Due to the impromptu nature of such a lockdown during the COVID-19 pandemic, 'covibesity', or rapid weight gain, is on the rise (Khan & Moverley Smith 2020). This global phenomenon is extremely significant and calls for both recognition and action. In light of these issues and the increasing popularity and promotion of weight loss products, it is likely that their use will increase despite the lack of convincing evidence of their efficacy. Additionally, these products aim to be marketed mostly to vulnerable younger women and others who have a negative view of their body weight (Ambak et al. 2018) and seek to keep their body weight within the accepted body mass index (BMI) ranges (Kilpi et al. 2014). Hence, it is crucial to identify the usage of weight loss product among university students especially among health or medical students. Even though there were study found out that the KAP on obesity score of medical students was higher compared to non-medical students but the score for knowledge (68%) and attitude (77%) were good but for practice were only fair (57%) (Waghmare et al. 2019). This indicated they might have knowledge but not necessarily practically know on diseases, particularly the wide field of obesity. Due to the limited number of studies conducted locally, there are currently inadequate evidence to investigate the issue of weight loss product use (Ambak et al. 2018). Highlighting the issues of weight loss products can aid in the development of more effective and safer health programmes for weight control in diverse populations. Additionally, monitoring the use of weight-loss products enables action to be taken to raise awareness of the risks linked to their misuse (Lubowiecki-Vikuk, Król-Zielińska & Kantanista 2019). This study set out to determine the use of weight loss products and their association to BMI and other related variables.

MATERIALS AND METHODS

This cross-sectional study was conducted from August to December 2021 and covered three schools at the USM Health Campus in Kubang Kerian, Kelantan: the School of Medical Sciences, the School of Dental Sciences, and the School of Health Sciences. Due to the restricted movement, the data was gathered using an online questionnaire in Google Form. Participants for this study were chosen using convenience sampling. Malaysian undergraduate students aged 18 and up were the only ones eligible. Those who were unable to recall their recent or current body weight were exclusion criteria. The sample size was calculated using one proportion calculation with an anticipated population proportion (p) of 0.078 (Badrin, Daud & Ismail 2018) to estimate the sample size needed for the study and was set at 133 participants (with a 20% drop out rate). The USM Research Ethics Committee (Human) granted ethical approval (JEPeM code: USM/JEPeM/21060459).

The questionnaire had six sections: (A) Sociodemographic and Health Status, (B) Body Weight Status, (C) Consumption of Weight Loss Products, (D) Characteristics of Weight Loss Product Usage, (E) Body Weight Perception and Satisfaction, and (F) Perception on Weight Loss Products using Likert Scale. Parts D, E, and F of the questionnaire were created specifically for a Malaysian study. The questionnaire was developed using a thorough literature review and suggestions from two experts in the field. After conducting face validation process for comprehensive and feasibility testing, the questionnaire was pre-tested for reliability. Internal consistency was 0.69 for questions regarding body weight status and 0.82 for perceptions of the safety and effectiveness of weight loss products (Abd Malik, Muhammad & Ali 2019).

Data entry and analysis were performed using Version 26.0 of SPSS. Using descriptive statistics, the socio-demographic profiles of the participants were summarised. For numerical data, such as age, the mean ± SD was utilised, whereas the frequency (percentage) was utilised for categorical data. Fisher's exact test and Pearson's Chi-square test were used to examine the association between the use of weight loss products and BMI and other variables. A level of significance was established with a p-value of <0.05. The Mann-Whitney U test with a significance level of p-value of < 0.05 was used to compare the BMI difference between weight loss product users and non-users.

RESULTS

The majority of participants were female (78.2%), Malay (80.5%), and from the School of Health Sciences (75.2%). In terms of financial status, more than half of participants (54.1%) were supported by student loans, with the remainder relying on either parental contribution (15.8%), scholarships (24.1%), or their own income and savings (6.0%). Only 15.0% of the participants suffered from medical conditions such as asthma, eczema, tonsillitis, and gastritis. According to this study, more than half of the participants (56.4%) had a normal BMI. The proportions of participants who were underweight and overweight were 16.5% and 18.8%, respectively. Meanwhile, the lowest percentage of participants (8.3%) were found to be obese. It was discovered that 14 out of 133 (10.5%) people tried weight loss products. A total of 119 (89.5%) of the

participants have never used weight loss products and are therefore classified as non-users.

Table 1 also displays the participants' perceptions and satisfaction with their body weight. The perceptions of bodyweight were according to the categorical of BMI and the participants chose which BMI categories describe themselves and the results shown 18% perceived themselves to be underweight, 25.6% as overweight, and 6% as obese. The remainder, which comprised half of them (50.4%), were perceived to be of appropriate weight. In terms of body weight satisfaction with current body weight, nearly half of all participants (45.8%) were dissatisfied with their current body weight. Only 23.3% of people were happy with their current weight. More participants (57.9%) disagree that dietary supplements for weight loss are effective in reducing weight, and the majority (76.7%) believe that weight loss products are unsafe and have side effects. Furthermore, only 15.8% of participants said they would recommend the products to friends or family to help them lose weight.

TABLE 1. Sociodemographic, Health Status, Body weight Perception and Satisfaction and Perception on weight loss products (n=133)

Variables		n (%)
Age, in years (mean age ± SD)		22.0 ± 3.1
Gender		
	Male	29 (21.8)
	Female	104 (78.2)
School		
	School of Health Sciences	100 (75.2)
	School of Dental Sciences	18 (13.5)
	School of Medical Sciences	15 (11.3)
Ethnicity		
	Malay	107 (80.5)
	Chinese	14 (10.5)
	Indian	5 (3.8)
	Others	7 (5.2)
Marital status		
	Single	132 (99.2)
	Married	1 (0.8)
Current financial assistance		
	Student Loan	72 (54.1)
	Parents' contribution	21 (15.8)
	Scholarship	32 (24.1)
	Own income and savings	8 (6.0)
Presence of medical condition		
	Yes	20 (15.0)
	No	113 (85.0)
BMI		
	Underweight	22 (16.5)
	Normal	75 (56.4)
	Overweight	25 (18.8)
	Obese	11 (8.3)
Consumption of weight loss products		
	Yes	14 (10.5)
	No	119 (89.5)
Body weight perception		
	Underweight	24 (18.0)
	About the right weight	67 (50.4)

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Overweight	34 (25.6)
Obese	8 (6.0)
Satisfaction on current body weight	
Very satisfied	9 (6.8)
Satisfied	22 (16.5)
Neutral	41 (30.8)
Unsatisfied	43 (32.3)
Very unsatisfied	18 (13.5)
Do you think dietary supplements for weight loss are effective in reducing weight?	
Agree	56 (42.1)
Disagree	77 (57.9)
Do you think the products used are safe and have no side effects?	
Agree	31 (23.3)
Disagree	102 (76.7)
Are you going to recommend friends or family to use the products to help them lose weight?	
Agree	21 (15.8)
Disagree	112 (84.2)

Table 2 summarises the characteristics of weight loss product usage among participants who used weight loss products. During the study period, 3 (21.4%) of the 14 users were still using the weight loss products. Dietary supplements were the most commonly used (64.3%), weight loss medication was used by 14.3%, and 31.4% of users used both. The majority of users used weight loss products for less than 6 months and on a daily basis (92.9%). All of the users did not seek medical advice about the weight loss products, and the vast majority of them (92.9%) tried dieting before using weight loss products. The most common reasons for using weight loss products were to lose weight faster (50%), after failing to achieve the desired weight loss target through dieting and exercise (21.4%), to improve physical appearance (14.3%), and to avoid peer, colleague, or family pressure (14.3%).

TABLE 2. Characteristic of Weight Loss Product Usage (n=14)

Variable	n (%)
Still taking weight loss products	
Yes	3 (21.4)
No	11 (78.6)
Type of products	
Weight loss medication	2 (14.3)
Dietary supplement	9 (64.3)
Both	3 (21.4)
Duration of usage	
< 6 months	13 (92.9)
> 6 months	1 (7.1)
Frequency of consumption	
Daily	13 (92.9)
Weekly	1 (7.1)
How do you know about the products?	
Gift from Family	2 (14.3)
Purchase through the Internet	4 (28.6)
Purchase directly from vendor/suppliers through an agent	6 (42.9)
Purchase directly from vendor/suppliers through shops	2 (14.3)

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Had discussed the used of weight loss product with a doctor	
Yes	0 (0.0)
No	14 (100)
History of dieting	
Yes	13 (92.9)
No	1 (7.1)
Reason for consuming weight loss products	
I want to lose weight quickly	7 (50.0)
I have tried dieting and exercise, but it did not work	3 (21.4)
To improve my physical appearance	2 (14.3)
Pressure from friends, colleagues, or family	2 (14.3)

Table 3 represents the association between sociodemographic data, BMI, body weight perception, and weight loss product use. According to the results, the median BMI of weight loss product users was significantly higher [25.56 (IQR 6.6) kg/m^2] than the median BMI of non-weight loss product users [21.35 (IQR 5.3) kg/m^2] using the Mann-Whitney Test (p<0.015). The result was consistent even when the BMI was classified according to WHO criteria when using Fisher Exact Test (p<0.042), where it can be seen that the percentage of overweight and obese people using weight loss products is higher (57.1%) than the percentage of overweight and obese people who did not use weight loss products (23.5%).

TABLE 3. Associated factors to the use of weight loss products (n=133)

Variables	Use of weight loss products, n (%)		p-value
	Yes (n = 14)	No (n = 119)	
Gender			1.000
Male	3 (21.4)	25 (21.0)	
Female	11 (78.6)	94 (79.0)	
School			0.500
Health Sciences	12 (85.7)	88 (73.9)	
Dental Sciences	2 (14.3)	16 (13.4)	
Medical Sciences	0 (0.0)	15 (12.6)	
Ethnicity			0.547
Malay	13 (92.9)	94 (79.0)	
Chinese	0 (0.0)	14 (11.8)	
Indian	0 (0.0)	5 (4.2)	
Others	1 (7.1)	6 (5.0)	
Marital Status			0.895
Married	0 (0.0)	1 (0.8)	
Not married	14 (100.0)	118 (99.1)	
Current financial assistance			0.919
Student Loan	9 (64.3)	62 (52.1)	
Parents' contribution	2 (14.3)	19 (15.9)	
Scholarship	3 (21.4)	29 (24.4)	
Own income and savings	0 (0.0)	8 (6.7)	
Others	0 (0.0)	1 (0.8)	
Presence of medical condition			0.488
No	13 (92.9)	101 (84.9)	
Yes	1 (7.1)	18 (15.1)	

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BMI			
BMI [median (IQR)] kg/m2	25.56 (6.6)	21.35 (5.3)	0.015[a]
Underweight	1 (7.1)	21(17.6)	0.042[c]
Normal	5 (35.7)	70 (58.8)	
Overweight	5 (35.7)	20 (16.8)	
Obese	3 (21.4)	8 (6.7)	
Body weight perception			0.058
Underweight	0 (0.0)	24 (20.2)	
About the right weight	6 (42.8)	60 (50.4)	
Overweight	6 (42.8)	29 (24.4)	
Obese	2 (14.3)	6 (5.0)	
Satisfaction on current body weight			0.011[b]
Unsatisfied	11 (78.6)	50 (42.0)	
Satisfied	3 (21.4)	69 (58.0)	
Perception on the effectiveness of weight loss products			0.393
Agree	8 (57.1)	49 (41.2)	
Disagree	6 (42.9)	70 (58.8)	
Perception on the safety of weight loss product			0.041[b]
Agree	7 (50.0)	25 (21.0)	
Disagree	7 (50.0)	94 (79.0)	

[a] $p < 0.05$ showed significant using Mann-Whitney test
[b] $p < 0.05$ showed significant using Pearson's chi-square test
[c] $p < 0.05$ showed significant using Fisher's exact test

According to the same table, the majority of those who used a weight loss product were dissatisfied with their present body weight (78.6%) compared to those who were satisfied with their weight (21.4%). Meanwhile, individuals who did not use a weight loss product were more content with their weight (58.0%) than those who were dissatisfied with their current body weight (42.0%) ($X^2 = 6.74$, p-value = 0.011). Moreover, the majority of those who did not use a weight loss product disagreed that it is safe (79.0%) compared to perceived as safe (21.0%). Meanwhile, those who taking weight loss product agree and disagree that weight loss product is safe (50.0%, each) (p-value = 0.041).

DISCUSSION

The results show that the majority of undergraduates have a normal body weight (56.4%). The current study demonstrates that 27.1% of USMKK students are overweight or obese, which is comparable to university students in Selangor (23.2%) (Abdul Aziz et al. 2020) but lower than university students in Kuala Lumpur (32.7%) (Chan et al. 2020).

Weight loss products appear to be a more accessible and popular way to assist people in losing weight than traditional diet restriction and exercise regimens (Verma et al. 2018). According to this study, 10.5% from 133 USMKK undergraduate students use weight loss products. This finding is consistent with another study by Badrin, Daud and Ismail (2018), which found that only 7.8% of private college students in Kelantan state used weight loss products. In a survey of overweight and obese patients who visited a local public clinic, only 18.7% reported using weight loss products (Abd Malik, Muhammad & Ali 2019) . There are also studies among American adults that found weight loss products to be only 15.2% (Blanck et al. 2007) and 13.8% (Nicklas et al. 2012). The prevalence of weight loss user among students are relatively small might be due to financial issues that make buying power are also low to buy weight loss products. Despite the fact that the percentage is not particularly high, it is critical to identify the percentage of people who engaged in unhealthy weight loss behaviour.

Those who used a weight loss product had a higher BMI than those who did not use a weight loss product. According to reports, 33.9% of American adults who use

weight loss products have a higher BMI (Pillitteri et al. 2008). Kim, Lim and Kwak (2008)discovered that overweight and obese women were more likely than normal-weight peers to engage in at least one unhealthy weight control behaviour, whereas underweight women were less likely. According to Eisenberg, Neumark-Sztainer and Lust (2005) obese people are less likely to have an ideal shape, are more likely to experience social pressure and/or make negative comparisons with others and influenced their perception of body weight when compared to other BMI groups.

Aside from that, 42.8% of the users in our survey are classed as underweight or normal, implying that no weight loss is required. This problem is assumed to be related to distorted body image or body weight dissatisfaction. Senekal et al. (2016) discovered that normal-weight students may engage in detrimental weight-reduction methods in order to 'normalise' their weight, increasing the likelihood of harmful weight loss and the development of eating disorders.

None of the weight loss product users took the products as prescribed by a medical practitioner, and all users did not consult with a doctor before using them. Zhivikj et al. (2020) reached the same conclusion after discovering that only 16% of weight loss supplement users sought professional advice before using them. Furthermore, our study found that none of the users lost weight to improve their health, despite the fact that studies have shown that BMIs greater than 25 kg/m^2 are associated with an increased risk of mortality and cardiometabolic disorders, with the risk increasing as the BMI increases (Ryan & Yockey 2017). Besides, the types of weight loss products used were dietary supplements rather than weight loss medication (64.3%). This supports Pillitteri et al. (2008)'s conclusion that, as there has been a gradual increase in overweight and obesity in recent years, dietary supplement use appears to be on the rise as well. This is due to the fact that they are far more widely available without a prescription than prescription medications, which necessitate a doctor's visit and prescription (Pillitteri et al. 2008). It also reveals that the majority of weight users were introduced to and obtained the weight loss product through an easily accessible internet purchase (28.6%) and directly from vendors or suppliers (42.9%).

According to the current study, a large percentage of users (92.9%) have a history of dieting to lose weight. Failing to stick to a weight loss strategy in order to lose weight can lead to demotivation (Ismail et al. 2018). We can attribute this to the reason that some users (21.4%) sought an easy weight management approach by using weight loss products after failing with the conventional method. Furthermore, the most common reason for using weight loss products is to achieve a faster result (50%). This represents how the marketing gimmick that promises effectiveness and quick results influenced the users.

The current findings are consistent with previous research that found a statistically significant association between the use of weight loss products and body weight satisfaction (Abd Malik, Muhammad & Ali 2019; Getaneh, Giardina, and Findley 2013; Machado, Silveira & Silveira 2012). A high proportion of overweight and obese perceived body weight was found among users of weight loss products, and the majority of these individuals were also dissatisfied with their current body weight. The latest findings are also consistent with previous research, which found that the perception of being overweight and body dissatisfaction are associated with weight-control behaviours and efforts (Cuypers et al. 2012; Duong and Roberts 2014; B. Park et al. 2019). Another conclusion of the current study is that the perceived safety of weight loss products is statistically associated with the use of weight loss products. Believing that a weight loss product is safe increases the likelihood of trying it. Wronka, Suliga and Pawlińska-Chmara (2013) explain this by claiming that a user's decision to utilise weight loss products to lose weight is also impacted by their impression of the products' safety. While a recent study by Zhivikj et al. (2020) found that approximately 70% of weight loss supplement consumers reported no adverse health effects from using the products, many were sceptical regarding their quality (Zhivikj et al. 2020).

Although the present results support that there is an association between the use of weight loss products and BMI, it is appropriate to recognize several potential limitations. Since this was a cross-sectional study, a causal relationship between BMI or other factors and the usage of weight loss products could not be established. The generalizability of the results is limited as we had to apply convenience sampling via self-reported questionnaires as it is quick, cheap, and easy recruitment. This may make this study vulnerable to reporting and selection bias. Moreover, this study also only covered a small sample size due to the small, anticipated population proportion (p) that represents the prevalence of weight loss product use, resulting in the small power of the study and may make it difficult to determine if our outcome is a true finding. In addition to this, our study also only interpret data from healthcare students, where their knowledge and concern about health, BMI and weight loss products may be different from non-healthcare students. To strengthen the generalizability of the findings, more research with randomly selected participants in healthcare and non-healthcare students is needed.

CONCLUSION

This study aims to examine the association between the use of weight loss products by USMKK students and their BMI. We found, through statistical analysis, that the use of weight loss products is associated with BMI among USMKK students, with a high proportion of users having an overweight or obese BMI. We noticed that a considerable percentage of users had a history of dieting and utilising weight loss products as a quick way to reduce weight or as an alternative after failing to lose weight using conventional ways. There was a statistically significant association between the use of weight loss products and the belief that they are safe. This is cause for concern because the majority of users do not seek medical advice, there is a lack of high-quality data to support the use of these products, and a great deal of information regarding their safety and health is unknown. There may be a need for additional research with improved methodology concerning perceptions of weight status, weight loss attempts, strategies, and outcomes.

ACKNOWLEDGMENTS

The authors would like to thank all of the USM students who participated and collaborated in this study at the USM Health Campus in Kelantan.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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Nurul Izzatie Ibrahim
NurZetty Sofia Zainuddin
Juliana Shamsudin
Dietetic Programme
School of Health Sciences
Universiti Sains Malaysia Health Campus
16150 Kota Bharu, Kelantan, Malaysia.

Correspondence: NurZetty Sofia binti Zainuddin

Email address: zettysofia@usm.my