Mind Over Plate: The Hypnotic Influence on Dietary Intake among Adults with Overweight and Obesity in Terengganu, Malaysia

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ABSTRACT

This study aimed to evaluate the effectiveness of hypnotherapy in improving dietary intake and weight status of young adults with high Body Mass Index (BMI) in a public university in Terengganu, Malaysia. This pre-and post-intervention randomly assigned 107 participants with BMI$\geq$25 kg/m² to either the Intervention Group (IG=53) or the Control Group (CG=54), for 12 weeks. All participants received health education (diet + exercise + behavioral recommendations) and completed food records, while those in IG had additional three hypnotherapy sessions once a month. Descriptive statistics and repeated measure Analysis of Covariance (ANCOVA) were utilized (SPSS 23.0). A total of 104 participants completed the trial (female=82.2%; student=71.0%; BMI=31.3±5.0 kg/m²). Results demonstrated significant decrements in weight (Mean Difference (MD)=-1.4 kg; p=0.021), total energy (MD=-269 kcal; p=0.033), carbohydrate (MD=-1.0% EI; p=0.019) and total fats (MD=-1.8% EI; p=0.002) intakes in IG after controlling for age, gender and baseline variables on repeated measurements. Hypnotherapy had a positive impact on energy intake, indicating its effectiveness in tackling eating habits. These findings are promising and could serve as a basis for future studies in hypnotherapy for weight loss.

Keywords: alternative therapy, hypnotherapy, nutritional status, obesity

INTRODUCTION

The "plague" of overweight and obesity has attained epidemic proportions and is growing at an unprecedented rate, notably in metropolitan places worldwide, including Malaysia (World Health Organization (WHO) 2021; Institute for Public Health (IPH) 2020). Overweight and obesity problems are linked to an increased risk of potentially fatal conditions like cardiovascular disease, diabetes, and certain types of cancers; hence various weight loss treatments have been developed to tackle these issues (Ong *et al.* 2023; Balwan *et al.* 2021; Dixon 2010). Besides, the ongoing Coronavirus Disease 2019 (COVID-19) outbreak has revealed new alarming relationships between obesity prevalence and increased vulnerability to health concerns, emphasizing the severity of the obesity crisis (Caussy *et al.* 2020; Dietz & Santos-Burgoa 2020).

Evidence suggests that comprehensive lifestyle modifications such as a calorie-restricted diet and increased physical activity are the mainstay of treatment for excess weight problems (Canuto *et al.* 2021; Wadden *et al.* 2020). However, poor compliance with healthy lifestyle patterns due to the abundance of unhealthy and high calories foods, busy schedules, increased automation of work in modern societies, and a time-consuming treatment has become a hurdle in achieving significant weight loss (Tak & Lee 2021; Monnier *et al.* 2021). Due to the failure of adherence to dietary prescriptions, there has been an increase in the demand for effective, safe and acceptable weight loss alternatives including hypnotherapy, in recent years (Canuto *et al.* 2021; Suelter *et al.* 2018).

Hypnotherapy is a therapeutic approach that uses hypnosis to induce relaxed state of focused attention and enhance positive changes in an individual (Elkins *et al.* 2015). According to Bhagat and Menon (2020), hypnotherapy enable an individual's mind and body to be focused and capable of making behavioural changes, for instance, maintaining healthy lifestyle in the case of weight problems. Hypnotherapy helps

improve self-control, boost self-esteem and increase motivation to change eating patterns (Pellegrini *et al.* 2021; Bo *et al.* 2018). It has also been shown to be effective in controlling emotional eating in female patients with obesity (Villa *et al.* 2009). Hartman and Zimberoff (2011) posit that hypnotherapy provide the unconscious mind with directives pertaining to both physiological and psychological maladies, thus facilitates the unconscious mind's ability to assimilate and adjust to concepts introduced by the therapist. People can be taught to minimize food consumption, choose healthy meals, and eat at certain times and specified quantities during hypnotherapy to encourage weight loss because they are more responsive to suggestions during an altered state of consciousness (Pellegrini *et al.* 2021).

The practice of hypnotherapy for weight loss has been documented in literature since the 1950s and believed to play an important component in managing excess weight problems (Roslim *et al.* 2022; Rousseaux *et al.* 2020). The use of hypnotherapy as an adjunctive strategy has also been increased in Asia, particularly in Indonesia and Malaysia. It has been documented that addition of hypnotherapy sessions together with nutrition counselling provided a significant beneficial weight loss among people with obesity (Rini *et al.* 2020). A similar, positive finding was also reported by researcher from Malaysia, who reported 4.61% of weight lose than those in the control group after three months of intervention (MD=-1.57 kg; p=0.003). These are thus inspiring evidence for the application of hypnotherapy for losing weight, but it does require further studies.

Despite the favorable outcomes of hypnotherapy in earlier research, most existing treatments are time-consuming, difficult to implement and based on aversion to high-calorie foods (Barabasz & Spiegel 1989; Bolocofsky *et al.* 1985). Due to lengthy interventions (varying from six months to two years) in previous hypnotherapy studies, which lead to high drop-out rate of participants, it is important to explore a straightforward and non-invasive technique. Hypnotherapy is also one of the least studied alternative treatments, with limited evidence of its use locally, notably in Terengganu, given the rising prevalence of obesity in this state (Sivam & Harith 2022). Therefore, this study aimed to assess the impact of hypnotherapy on dietary intake and body weight status among Malaysian individuals with overweight and obesity problems.

METHODS

Design, location, and time
This quasi-experimental investigation conducted in Kampus Gong Badak, Besut and Perubatan, Universiti Sultan Zainal Abidin (UniSZA), Terengganu, Malaysia. The UniSZA Human Research Ethics Committee (UniSZA/UHREC/2019/116) approved this study.

Sampling
In this study, convenience sampling was employed. G*Power software version 3.1 was used to calculate sample size (p=0.05, power=80%; attrition rate=20% and effect size=0.15) (Faul *et al.* 2009; Schäfer & Schwarz 2019). Flyers and e-poster of the study were disseminated to all departments in all three campuses between July 2020 until December 2020. Those who responded to the advertisement then were screened for inclusion criteria and were briefed about the study. A total of 107 individuals participated in this study. Participants must be students or staff with a BMI $\geq$25 kg/m^2, at least 18 years old, and able to understand Malay/English. Meanwhile, participants were excluded if they were: (1) currently enrolled in another weight loss program; (2) having hearing impairment; (3) having chronic medical conditions requiring regular medication; (4) pregnant or post-menopausal and (5) displaying any psychotic issues.

Eligible participants were randomly assigned to either the intervention group (hypnotherapy + general lifestyle modifications) or the control group (general lifestyle modifications, i.e., diet + physical activity + behavioral recommendations). To avoid selection bias, the random assignments were made successively with a random number generator in Excel, with a ratio of 1:1 between the two groups. The recruitment procedure is shown in Figure 1

Data collection
Participants' written agreement was sought and those who agreed were then requested to fill out a self-administered demographic form at the beginning of the study. Then, a trained researcher took their height, weight and 24-hour dietary

recall. During subsequent sessions (week 1, 7 and 12), all of the respondents in both groups received health education talk which covered aspects of diet, exercise and tips for diet adherence (such as avoiding food purchases while hungry and chewing food thoroughly before swallowing). The components of health education talks were based on the Malaysia Dietary Guidelines 2020 (National Coordinating Committee on Food and Nutrition 2017) (e.g., reducing 500 calories per day, recommendations of increasing physical activity and guidelines on food choice when eating outside). The duration of the talks was about 15 to 30 minutes for each session. They also were guided the ways to record all the foods and drinks taken on each day using household measurements and were asked to send the completed daily food record to the researchers via Google Form every week. Participants also were questioned about the difficulties and hurdles with the intervention

at the end of each session. After going through the entire procedure, each participant was given a token of appreciation.

Interventions. Those in the intervention group underwent three hypnotherapy sessions from a certified and licensed hypnotherapist one month apart (week 1, 7 and 12), in addition to health education. The 30-minute hypnotherapy session took place in a cozy room at an academic block and was delivered in Malay. The average time taken for the sessions was around one hour and 45 minutes. The hypnotherapy sessions were scheduled once a month to allow for the processing and integration of the therapeutic suggestions given during the sessions (Bo *et al.* 2018). The first session began with a brief explanation of the hypnotherapy process and potential outcomes. After that, a rapid induction technique was employed to heighten relaxation and allow individuals to enter a hypnotic condition
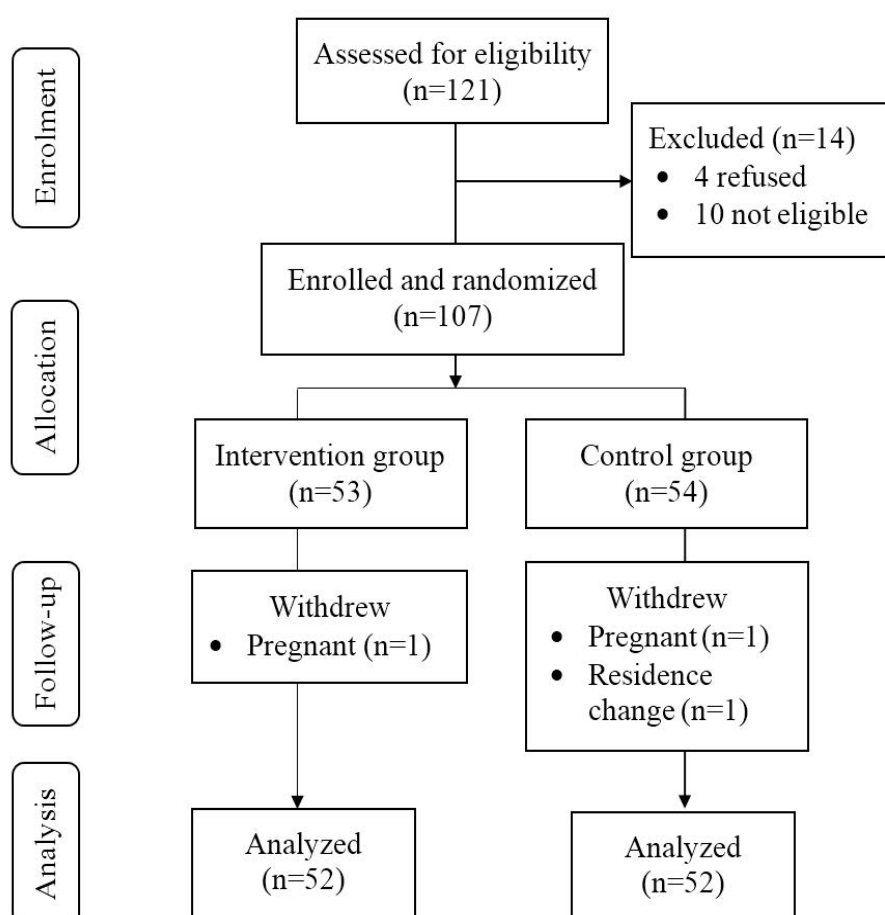

Figure 1. Flow chart of participants

promptly (Bo *et al.* 2018). Following the deepening state, ego-strengthening approaches with favorable recommendations for eating a healthy diet were applied. During the awakening phase, participants were brought out from the hypnotic condition. Then, during the follow-up session (week 7), the suggestions introduced in the initial session were reinforce and participants' progress were assessed. The third hypnotherapy session (week 12), was identical to the second session, with the inclusion of recommendation for maintaining weight loss.

Sociodemographic form. This sociodemographic form consisted questions about the participant's age, sex, ethnicity, level of education, marital status, and monthly earnings.

Height and weight measurement. The TANITA (BC-583) digital weighing scale and Seca 213 portable stadiometer were used to measure height and weight, respectively. BMI was calculated using the formula (BMI=weight (kg)/height^2 (m^2)) and categorized according to WHO Expert Consultant (2004) cut-off points as such: (a) overweight: 25.0–29.9 kg/m^2; (b) obese type I: 20.0-34.9 kg/m^2; (c) obese type II: 35.0–39.9 kg/m^2; (d) obese type III: >40.0 kg/m^2 (WHO 1995).

Daily food record. The nutritional intake was derived from daily food records completed by the participants. Participants were required to record their daily food and beverage intakes (meal type, preparation method, ingredients and quantities) and submit them through Google Forms every week. A complete list of food photographs and local household measurements (bowls, cups, spoons and plates) were utilised to aid participants in reconising and quantifying portion sizes ingested (Suzana *et al.* 2015; Ministry of Health 2004). In order to migitate under or over-reporting, researchers provide training during the first session (week 1) and continuously checked the food record with the participants. Any missing or vague information were retrieved from the participants at the following sessions (week 7 or 12). Besides, to reduce the day-to-day variability of an individual's food consumption throughout working days and weekends, participants were asked to fill out a food diary for at least two weekdays and one weekend day. The individuals' intake of energy and macronutrients (carbohydrates, protein and total fats) were calculated and reported.

Data analysis

The macronutrient intakes of each participant were analyzed using Nutritionist Pro™ (First Data Bank, USA) software. Data on energy and macronutrient intakes were then uploaded to Statistical Package for Social Science (SPSS) version 23.0 (Armonk, NY, US) for statistical analysis. Descriptive statistical techniques were used to analyze the socio-demography, body weight and nutrient intakes. The effect of hypnotherapy between groups (IG and CG) was evaluated using repeated measures analysis of covariance (ANCOVA) with age, gender and baseline as covariances. The analysis was considered statistically significant at a p≤0.05.

RESULTS AND DISCUSSION

Demographic data

Out of 107 staff and students, three individuals were dropped from the study due to pregnancy and a change of residence. Finally, 104 participants (52 in each group) completed this study (Figure 1). The mean age was 26.3±8.0 years old with most of them being female (82.2%), Malays (98.1%) and students (71.0%). According to the standard WHO classification, the majority were obese (Type I: 29.9%; Type II: 17.8%; Type III: 6.5%) while the other 45.8% were categorized as overweight. Participants' total energy intakes (1,869±662 kcal; acceptable range=1,780–2,180 kcal) were within the Malaysian Recommended Nutrient Intakes (National Coordinating Committee on Food and Nutrition 2017). Demographic data are presented in Table 1.

Changes in body weight

Table 2 presented the changes from pre- to post-intervention in each variable (weight, total energy and macronutrient intakes) for both groups. Participants in the intervention group showed a statistically significant reduction in body weight, compared with the control group (Adjusted Mean Difference (AMD)=-1.4 kg; p=0.021) after 12 weeks. These weight losses were comparable with previous studies which found that hypnotherapy has led to weight loss, with a difference between groups ranging from one to eight kilograms (Ramondo *et al.* 2021; Bo *et al.* 2018; Bolocofsky *et al.* 1985). Although the

Table 1. Demographic characteristics of participants

Characteristics	IG (n=53)	CG (n=54)	Total (n=107)	*p*
Age (years) (Mean±SD)	26.3±8.5	26.2±7.6	26.3±8.0	0.323*
Gender (n (%))				
Male	10 (9.3)	9 (8.4)	19 (17.8)	0.766**
Female	43 (40.2)	45 (42.1)	88 (82.2)	
Ethnicity (n (%))				
Malay	51 (47.7)	54 (100.0)	105 (98.1)	0.243**
Sabahan	2 (1.9)	0 (0.0)	2 (1.9)	
Marital status (n (%))				
Single	36 (33.6)	42 (53.8)	78 (72.9)	0.252**
Married	17 (15.9)	12 (11.2)	29 (27.1)	
Educational level (n (%))				
STPM/Diploma/A-Level	17 (15.9)	20 (18.7)	37 (34.6)	0.108**
Degree	26 (24.3)	31 (29.0)	57 (53.3)	
Master's Degree/PhD	10 (9.3)	3 (2.8)	13 (12.1)	
Monthly Individual Income (n (%))				
No income	30 (28.0)	33 (30.8)	63 (58.9)	0.616**
B40 (≤RM2,500–RM4,849)	16 (15.0)	12 (11.2)	28 (26.2)	
M40 (RM4,850–RM10,959)	7 (6.5)	9 (8.4)	16 (15.0)	
Height (m)	1.6±0.1	1.6±0.1	1.6±0.1	0.652*
Weight (kg)	79.4±15.3	79.5±15.4	79.4±15.4	0.972*
BMI status (n (%))				
Overweight (25.0–29.9 kg/m^2)	27 (25.2)	22 (20.6)	49 (45.8)	
Obese type I (30.0–34.9 kg/m^2)	11 (10.3)	21 (19.6)	32 (29.9)	
Obese type II (35.0–39.9 kg/m^2)	12 (11.2)	7 (6.5)	19 (17.8)	
Obese type III (>40.0 kg/m^2)	3 (2.8)	4 (3.7)	7 (6.5)	
Mean±SD	31.3±5.0	31.5±4.8	31.4±4.9	0.816*
Total energy (kcal)	1,868±557	1,606±429	1,869±662	0.002*
Carbohydrate (% total kcal)	53.6±2.6	55.4±3.4	54.4±3.1	0.009*
Protein (% total kcal)	14.8±1.7	13.8±1.8	14.4±1.8	0.006*
Total fats (% total kcal)	31.5±1.9	30.9±3.0	31.2±2.5	0.253*

Data are displayed as n (%) or mean (SD); *p-value generated from independent t-test; **p-value generated from Pearson Chi-square test; *Statistically significant value was set at p<0.05; IG: Intervention Group; CG: Control Group; STPM: S*ijil Tinggi Pelajaran* Malaysia; PhD: Doctor of Philosophy; BMI: Body Mass Index; SD: Standard Deviation; RM: Ringgit Malaysia B40: The lowest 40% of households; M40: The middle 40% of households

Table 2. Changes in body weight and dietary intakes within and between groups

Variables	Group n=107	Time-effect				Treatment-effect	
		Week 1	Week 12	MD (95% CI)[a]	*p*	MD (95% CI)[a]	*p*
Weight (kg)	IG (n=53)	79.0 (75.1–83.0)	75.3* (74.8–75.9)	-3.7 (-2.9–4.5)	<0.001*	-1.4 (-1.6--0.1)	0.021*
	CG (n=54)	79.7 (75.8–83.6)	77.4* (76.1–77.3)	-2.3 (-1.6–-3.0)	<0.001*	1.0	
Total energy (kcal)	IG (n=53)	1,868 (1,738–1,998)	1,468 (1,394–1,543)	-399.6 (190.5–423.8)	<0.001*	-269 (12–309)	0.033*
	CG (n=54)	1,606 (1,476–1,736)	1,736 (1,663–1,811)	130.7 (68.2–145.6)	0.653	1.0	
Carbohydrate (% kcal)	IG (n=53)	53.6 (53.1–54.2)	55.4 (54.6–56.2)	1.8 (2.7–0.9)	<0.001*	-1.0 (-1.9--0.2)	0.019*
	CG (n=54)	55.4 (54.5–56.2)	52.6 (51.8–53.3)	-2.8 (-4.1--1.5)	<0.001*	1.0	
Protein (% kcal)	IG (n=53)	14.8 (14.4–15.2)	15.5 (14.9–16.0)	0.6 (-1.3--0.1)	0.071	-1.5 (-1.7--0.5)	0.662
	CG (n=54)	13.7 (13.3–14.2)	16.0 (15.3–16.6)	2.3 (1.4–3.0)	<0.001*	1.0	
Total fats (% kcal)	IG (n=53)	31.5 (31.5–31.5)	29.1 (28.4–29.9)	-2.4 (-3.1--1.7)	<0.001*	-1.8 (-1.7--0.6)	0.002*
	CG (n=54)	30.9 (30.8–31.1)	31.6 (30.9–32.1)	0.6 (-0.1–1.2)	0.086	1.0	

[a]Repeated measures ANCOVA within and between group analysis with regard to time was applied; Covariates such as age, gender, baseline, total energy, carbohydrate and protein were controlled; Assumptions of normality, homogeneity of variances, and homogeneity of regression were checked and were fulfilled; Level of significance was set at p<0.05; *Significant variables; IG: Intervention Group; CG: Control Group; CI: Confidence Interval; MD: Mean Difference

weight loss differences among groups were minor, these findings could offer supportive evidence for further research on hypnotherapy in combating excess weight problems. In addition, the current study was also relatively brief (a two-hour session per month), making it easier to be implemented.

Changes in dietary intake

Similarly, participants in IG also demonstrated statistically significant differences in total energy (AMD=-269 kcal; p=0.033), carbohydrate (AMD=-1.0% kcal; p=0.019) and total fats (AMD=-1.8% kcal; p=0.002) intakes compared to their counterparts at post-study after adjusting for covariates. These results were intriguingly comparable with previous study in Italy, which found some evidence that participants who underwent three sessions of hypnotherapy significantly decreased the mean energy intake than those in the control group

(Bo *et al.* 2018). Another study among people with overweight and obesity in Indonesia also demonstrated a significant calorie intake reduction after intervened with hypnotherapy for five weeks (Nurlita *et al.* 2007).

Impact of hypnotherapy on weight and dietary intake

The considerable reduction in body weight and dietary intake might be explained by the successfully including healthy lifestyle improvements in the suggestion phase during the hypnotherapy session. As Elkins *et al.* (2015) described, hypnotherapy has been linked to increase the capacity and better response to suggestions. Individuals who have been hypnotized are more likely to adhere to the hypnotherapist's advice and adopt the weight-loss paradigm (lower calorie intake and enhance physical activity) (Roslim *et al.* 2022). Earlier studies reported that hypnotized people improved in dietary and physical activity behaviours compared to their counterparts (Bo *et al.* 2018). Additionally, noticeable change in eating behaviour such as making healthier food choices, reducing portion sizes and controlling overeating among obese participants was found following six months of hypnotherapy (Gelo *et al.* 2014). The study took longer time to examine changes than current study due to lack of healthy eating advice during the intervention. Indeed, hypnotherapy coupled with healthy eating suggestions could help individuals alters and improve their lifestyle habits and consequently lose weight.

According to Barabasz & Spiegel (1989), hypnotherapy enables people to adjust their actions and behaviour to correspond with their objectives, for example, reducing cravings for particular foods and learning to recognize body cues for hunger and fullness to avoid overeating. Earlier literature also had documented that hypnotherapy reduced unpleasant food cravings and improved eating habits (Pellegrini *et al.* 2021; Milling *et al.* 2018). The increased self-esteem is a vital step in becoming a determined person in order to alter their eating or lifestyle habits. According to Bo *et al.* (2018), hypnotherapy helps to rebuild the inner voice and reframe negative thoughts that linked with low self-esteem. Therefore, it can help to foster inner confidence to build healthy lifestyle behaviour. Besides, the ability of hypnotherapists to alter or replace undesirable meals and illustrate new perspective throughout the sessions was also responsible for changes in eating behaviours (Pellegrini *et al.* 2021). As most of the participants were students and often skipped their meals (Rusli & Harith 2020), hypnotherapists in this study tailored the approach to include foods readily available on campus to promote regular consumption of healthy foods. Huber *et al.* (2019) proposed that trust and a strong bond between hypnotherapists and individuals could influence their lifestyle changes to achieve the target. For instance, good communication by a hypnotherapist to explore the purpose and benefits of losing weight may improve individuals' motivation to achieve a healthy weight in the long run.

Indeed, this study found that hypnotherapy is beneficial in aiding the acquisition of healthy eating behavior and acting as an effective motivator to continue practicing it, hence preventing undesirable weight gain. Given that the technique is simple to use and lacks the potential for side effects, it portrays a beneficial role in facilitating people with obesity and overweight problem. Anyhow, some limitations should be acknowledged. For instance, using convenience sampling during recruitment and utilizing a single recruitment center might only partially represent individuals with excess weight concerns. Further studies can be done in the future to evaluate the effectiveness of hypnotherapy in a bigger context as the hypnotherapy services were provided widely in Malaysia.

CONCLUSION

The present study demonstrates that the adjuvant hypnotherapy provides significant weight reduction and BMI, total energy, carbohydrate and total fats intake among people with overweight and obesity in a public university in Terengganu, Malaysia. These could serve as the baseline investigation for a more extensive, long duration future research to confirm the effectiveness of hypnotherapy.

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DECLARATION OF CONFLICT OF INTERESTS

There is no competing interest amongst the authors.

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