

Evaluation of Malaysian Dietary Guidelines 2020: Compliance among Students in IMU

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INTRODUCTION

- Adults in Malaysia were **overweight (30.4%)** or **obese (19.7%)** [1]
- Malaysian Dietary Guidelines (MDG)** aimed to promote healthy eating and lifestyle [2]

University students

- ❖ Snacking, skipping meals and consuming fast food → overweight and obesity
- ❖ Poor compliance with the MDG recommendations (primarily **fruits, vegetables, and milk and dairy products**) [3,4]
- ❖ It is crucial to promote healthy eating with good compliance with MDG recommendations for all food groups among university students in Malaysia.

OBJECTIVE

To determine the number of servings of MDG food groups consumed and evaluate the dietary compliance with MDG 2020 among students in International Medical University (IMU).

METHODOLOGY

- Study Method**
- Due to the pandemic, this study was conducted virtually.
 - Study design:** Cross-sectional study
 - Study setting:** IMU, Kuala Lumpur
 - Sampling method:** Convenience sampling
 - Sample size:** 140 students (90 completed dietary data)

- Ethics Approval**
- Approved by International Medical University Joint-Committee on Research & Ethics (IMU-JC).
 - Project ID: BNT 12021(05)

- Subject Recruitment**
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| Inclusion criteria: | Exclusion criteria: |
| <ul style="list-style-type: none"> Healthy students Aged between 18 to 28 years old All ethnicities | <ul style="list-style-type: none"> Undergoing weight-loss program Had any genetic disorders, chronic diseases, or medical conditions Pregnant or lactating females DN and NT students in IMU |

- Dietary Intake**
- Two-days 24-hour dietary recall**
 - Included 1 weekday and 1 weekend
 - Recalled all the food and drinks consumed
 - Photo of standard household utensil aid and photo album were provided



- Statistical Analysis**
- SPSS Statistics for Windows, Version 26.0
 - Descriptive statistics** → mean serving of MDG food groups
 - Chi-square test** → association between sociodemographic characteristics and the compliance with MDG 2020
 - Significant level: P<0.05
 - Confidence level 95% were set

RESULTS

- A total of 140 students were recruited.
- Among them, 90 students who had completed the dietary recall were included in this study.

Table 1: Mean serving of MDG food groups consumed by students in IMU

MDG food Group	Mean serving (servings/day)	MDG recommendations (servings/day)	Meet/ Do Not Meet
Vegetables	2.06	≥ 3 servings	Do Not Meet
Fruits	0.42	2 servings/day	Do Not Meet
Cereal/grain products	3.11	3-5 servings/day	Meet
Meat/poultry	1.66	1-2 servings/day	Meet
Fish	0.45	1 serving/day	Do Not Meet
Legumes	0.35	1 serving/day	Do Not Meet
Milk/dairy products	0.32	2 servings/day	Do Not Meet
Plain water	4.79	6-8 glasses/day	Do Not Meet

Only cereal/grain products (3.11 servings/day) and meat/poultry (1.66 servings/day) met the MDG. Other food groups did not meet the MDG recommendations.

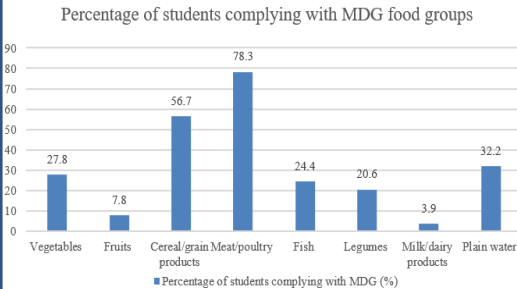


Figure 1: Percentage of students in IMU complying with MDG food groups

Table 2: The association between sociodemographic characteristics and the compliance with MDG 2020

Sociodemographic characteristics of students in IMU (n=90)	Vegetables n (%)	Fruits n (%)	Cereal/grain products n (%)	Meat/poultry n (%)	Fish n (%)	Legumes n (%)	Milk/dairy products n (%)	Plain water n (%)
Overall	25 (27.8)	7 (7.8)	51 (56.7)	71 (78.3)	22 (24.4)	19 (20.6)	4 (3.9)	29 (32.2)
Gender								
Male	3 (25.0)	0 (0)	9 (75.0)	10 (83.3)	1 (8.3)	1 (8.3)	0 (0)	2 (16.7)
Female	20 (25.6)	3 (3.8)	41 (52.6)	59 (75.6)	15 (19.2)	17 (21.8)	2 (2.6)	25 (32.1)
P-value	1.000	1.000	0.214	0.725	0.685	0.447	1.000	0.499
Ethnicity								
Chinese	21 (26.3)	2 (2.5)	43 (53.8)	62 (77.5)	15 (18.8)	15 (18.8)	2 (2.5)	24 (30.0)
Others*	2 (20.0)	1 (10.0)	7 (70.0)	7 (70.0)	1 (10.0)	3 (30.0)	0 (0)	3 (30.0)
P-value	1.000	0.301	0.502	0.693	0.684	0.412	1.000	1.000
Mother's education level								
Primary/secondary school	8 (23.5)	0 (0)	14 (41.2)	31 (91.2)	5 (14.7)	8 (23.5)	1 (2.9)	5 (14.7)
College/university	15 (26.8)	3 (5.4)	36 (64.3)	38 (67.9)	11 (19.6)	10 (17.9)	1 (1.8)	22 (39.3)
P-value	0.807	0.287	0.048*	0.011*	0.777	0.590	1.000	0.017*
Father's education level								
Primary/secondary school	9 (25.0)	0 (0)	18 (50.0)	31 (86.1)	7 (19.4)	7 (19.4)	0 (0)	7 (19.4)
College/university	14 (25.9)	3 (5.6)	32 (59.3)	38 (70.4)	9 (16.7)	11 (20.4)	2 (3.7)	20 (37.0)
P-value	1.000	0.272	0.397	0.126	0.783	1.000	0.515	0.101
Household income								
B40: <RM4360	4 (22.2)	1 (5.6)	8 (50.0)	12 (66.7)	5 (27.8)	7 (38.9)	0 (0)	7 (38.9)
M40: RM4360- RM9619	9 (21.4)	1 (2.4)	24 (57.1)	32 (76.2)	6 (14.3)	5 (11.9)	1 (2.4)	16 (38.1)
T20: >RM9619	10 (33.3)	1 (3.3)	17 (56.7)	25 (83.3)	5 (16.7)	6 (20.0)	1 (3.3)	4 (13.3)
P-value	0.488	0.821	0.868	0.415	0.448	0.057	0.747	0.051

P-value was derived from the chi-square test (Fisher-exact test). The significance level was set at P<0.05. *Others included Malay, Indian and others.

More than half of students complied with MDG for **cereal/grain products (56.7%)** and **meat/poultry (78.3%)**. Less than 10% of students complied with MDG for **fruits (7.8%)** and **milk/dairy products (3.9%)**.

↑ compliance of cereal/grain product and plain water but ↓ meat/poultry.

DISCUSSION

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|---|---|
| <p>Fruits and vegetables</p> <ul style="list-style-type: none"> MANS 2014 → 1.41 servings of fruits and 1.51 servings of vegetables per day [5] Omar <i>et al.</i> → 24% and 34% compliance of fruits and vegetables among Malaysians respectively [6]. <p>Reasons for low compliance:</p> <ul style="list-style-type: none"> ➢ Low availability of fresh fruits and vegetables ➢ High accessibility of fast food [7] ➢ Fluctuating prices of local fruits and vegetables in Malaysia [8] | <p>Legumes</p> <ul style="list-style-type: none"> Batis <i>et al.</i> → only 1-4% compliance [12] <p>Reasons for low compliance:</p> <ul style="list-style-type: none"> ➢ Indians → include dhal, beans, and lentils in their cooking and meals [13] ➢ Most students were Chinese in this study. |
| <p>Cereal/grain products</p> <ul style="list-style-type: none"> Omar <i>et al.</i> → at least 3 servings/day [6] Lee <i>et al.</i> → 5.5 serving/day [9] Supported by Egypt (71.8%) and Finland (54.9%) [10,11] ➢ Most Malaysians consumed rice daily [5] | <p>Milk/dairy products and plain water</p> <ul style="list-style-type: none"> Lee <i>et al.</i> → 0.1 servings/day of milk [9] In contrast with Egypt (19.1%) [10] and Finland (77.2%) for milk [11] In contrast with MANS 2014 [6] and NHMS 2019 [1] for plain water <p>Reasons for low compliance:</p> <ul style="list-style-type: none"> ➢ High cost of milk and dairy products [4] ➢ Lactose intolerance, especially in Asian populations [14] ➢ Preference for sugar-sweetened beverages (SSB) instead of milk [15] |
| <p>Meat/poultry and fish</p> <ul style="list-style-type: none"> Lee <i>et al.</i> → 2 servings of meat/poultry per day [9] MANS 2014 → at least 1.5 servings of fish per day [5] <p>The intake of meat/poultry > fish:</p> <ul style="list-style-type: none"> ➢ Malaysians preferred meat over fish, especially chicken [5] | <p>Association (P-value)</p> <ul style="list-style-type: none"> Cheng <i>et al.</i> → father's education level had a greater impact on children's diet [16] |

CONCLUSION

- Complied with MDG 2020: **cereal/grain products & meat/poultry products**
- Extremely low compliance: fruits & milk/dairy products**
- Mother's education level** was significantly associated with the compliance of **cereal/grain products, meat/poultry, and plain water.**

REFERENCES

- Institute for Public Health (IPH). National Health and Morbidity Survey 2020: Non-Communicable Diseases, Healthcare Demand and Health Utility. Institute for Public Health, Ministry of Health, Kuala Lumpur, Malaysia, 2020.
- National Coordinating Committee of Food and Nutrition (NCCFN). Malaysian Dietary Guidelines. Ministry of Health Malaysia, Putrajaya, 2020.
- Ganapathy S, Chellappa S, Chellappa A, Mohan K, Rajasekar S. Social and psychological factors affecting eating habits among university students in a Malaysian medical school: a cross-sectional study. *Malaysian Journal of Nutrition*. 2013;17(4):1-7.
- Gan WY, Mohd Nuzul M, Yusoff A, Yusoff A, Yusoff A. Differences in eating behaviors, dietary intake and body weight status between male and female Malaysian university students. *Malaysian Journal of Nutrition*. 2013;17(2):133-238.
- Malaysian adult nutrition survey (MANS) 2014 V1. Survey Methods. Internet. [cited 10 October 2021]. Available from: https://nuh.nhs.uk/images/stories/Files/Document/REPORT/MANS2014/MANS_Vol1-2-2014.pdf?download
- Chen H, Tang L, Liu X, Ramirez S. Dietary Intake and Physical Activity of Residential College Students. *University of Kelantan Journal of Science, Health, Education, and Physical Education*. 2014;1(1):1-15.
- Hakim N, Manoharan N, Danis A. Nutritional Status and Eating Practices among University Students in Selected Universities in Selangor, Malaysia. *Asian Journal of Clinical Nutrition*. 2012;3(1):7-10.
- Morgan G, Viruzawapa P, Swindon W, Worleley A, Dampour A, Lock K. Factors influencing fruit and vegetable intake among urban Fijians: A qualitative study. *Appetite*. 2006;101:154-158.
- Loi L. *What We Eat We Crave: Intake and Obesity of Malaysian Adults*. Nutrition Research and Practice. 2020;13(2):159-168.
- Arslan W, Sutermeister S, Samra A. Eating habits and dietary intake: Is adherence to dietary guidelines associated with importance of healthy eating among undergraduate university students in Pakistan? *Global Journal of Nutrition Science*. 2015;2(4):266-273.
- El-Anast W, Samra A. Adherence to recommended dietary guidelines and the relationship with the importance of eating healthy in Egyptian university students. *International Journal of Overweight Obesity*. 2020;4(2):79.
- Baki C, Akhtar S, Scheiner-Petersen T, Post L, Rivera A. Adherence to Dietary Recommendations for Food Group Intakes in Low in the Mexican Population. *The Journal of Nutrition*. 2016;146(9):1697-1698.
- Koo H, Park B, Lee S, Chung K, Kim M, Abd Talib A. Are Malaysian Children Achieving Dietary Guidelines Recommendations? *Asia Pacific Journal of Public Health*. 2020;32(1):35-40.
- Yahya N, Dawid N, Mahall L, Aziz O. Association of calcium intake, lactose intolerance and physical activity with bone health assessed by quantitative ultrasound among young adults of Malaysian university. *Archives of Osteoporosities*. 2021;16(1):1-8.
- Golshahi-Gubadi M, Maghlayi EA, Ghoreini GMF, Tajan MS, Comarino MAS. Beverage consumption in Filipino children and adolescents (7th National Nutrition Survey). *Nutritional concepts and practical applications*. Philadelphia: Elsevier; 2015:24-34.
- Cheng G, Du H, Kuan S, Liuba L, Zhang L. Development of a Dietary Index to Assess Overall Diet Quality for Chinese School-Aged Children: The Chinese Children Dietary Index. *Journal of the Academy of Nutrition and Dietetics*. 2016;116(4):688-697.