

# BREAKING THE BARRIER: WHAT'S KEEPING MALAYSIANS FROM EATING FRUITS AND VEGGIES?

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## BACKGROUND

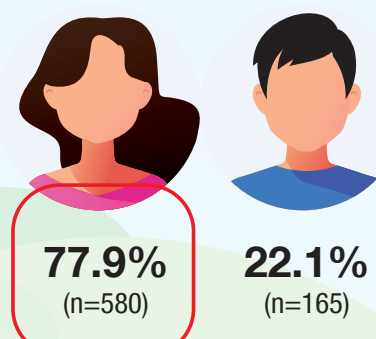
Adequate fruits and vegetables intake is vital for maintaining overall health and preventing non-communicable diseases (NCDs). Despite public health recommendations, fruits and vegetables consumption remains inadequate among many populations, including adults in Malaysia.

## OBJECTIVE

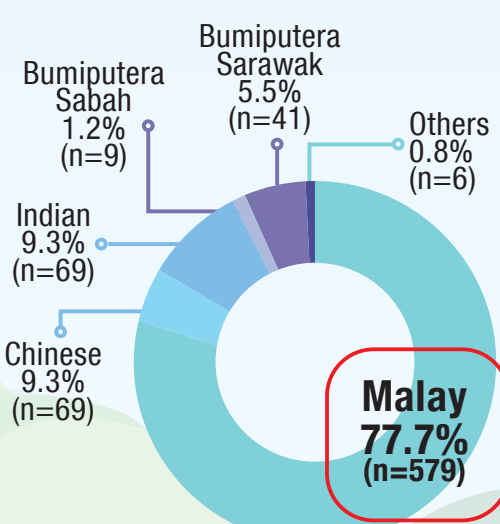
To determine personal, environmental, and behavioural factors affecting adults in Malaysia for inadequate fruits and vegetables intake.

## RESULT

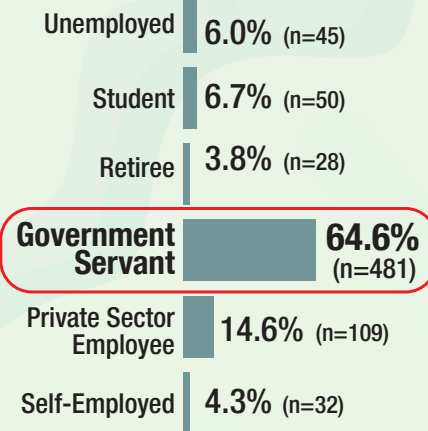
### GENDER



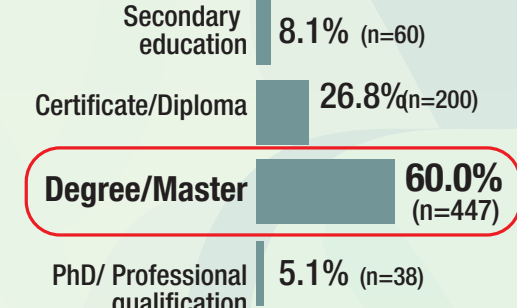
### RACE



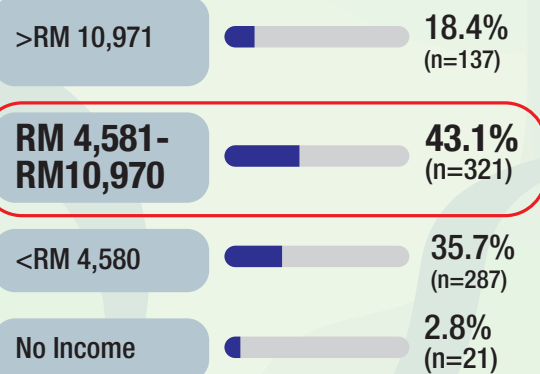
### EMPLOYMENT STATUS



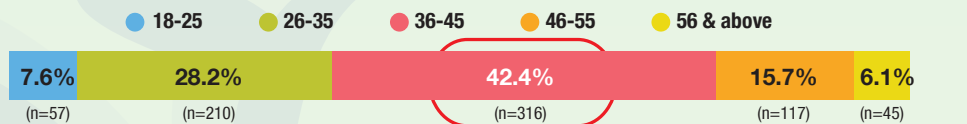
### EDUCATION LEVEL



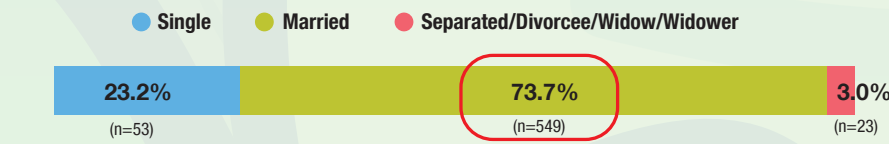
### HOUSEHOLD INCOME



### AGE



### MARITAL STATUS



## Post Hoc Test Findings on Fruit and Vegetable Intake

Post hoc tests revealed significant differences in fruits and vegetables intake barriers across occupation and age.

Barrier Type	Group Comparison	Mean Difference (95% CI)	p-value	Interpretation
Environmental (Fruit)	Government vs Private Employee	-0.25 (-0.45, -0.04)	0.007	Government employees reported lower barriers.
Environmental (Fruit)	56 yo & above vs 18-25 yo	-0.49 (-0.92, -0.05)	0.017	Older adults reported lower barriers.
Personal (Vegetable)	Private vs Not Working	-0.38 (-0.75, -0.01)	0.042	Private employees reported lower barriers.
Behavioural (Vegetable)	36-45 yo vs 18-25 yo	-0.30 (-0.55, -0.06)	0.005	Mid-aged adults reported lower barriers.

## CONCLUSION

Addressing specific challenges in fruit and vegetable intake is key to promoting healthier diets. The differences observed highlight the need for separate, targeted interventions. Further research is needed to inform effective strategies.

## ACKNOWLEDGEMENT

We would like to express our gratitude to the Director-General of Health and Deputy Director of Health (Research and Technical Support) Malaysia for allowing this presentation. We would like also express appreciation for the support from all parties that have contribute directly to complete this study.

## METHODOLOGY

Study design	Cross-sectional study; online survey via social media and email
Sampling technique	Convenience sampling
Sample size	745 respondents (Response rate 93.5%)
Target population	Malaysian adults aged 18 and above
Data collection period	February to April 2022
Data analysis	Descriptive analysis and post-hoc comparison tests
Ethical approval	Medical Research Ethics (MREC), (NMRR-20-2939-57685)

## Adequacy of Fruits and Vegetables Intake

	Adequate	Inadequate
Fruits	184 (24.7%)	561 (75.3%)
Vegetables	152 (20.4%)	593 (79.6%)

Inadequate fruits and vegetables is defined as  $\leq 2$  servings of fruits and/or  $\leq 3$  servings of vegetables per day. 561 participants (75.3%) did not consume enough fruit; 593 participants (79.6%) did not consume enough vegetables. Most participants with inadequate fruit and vegetable intake were aged 36–45, worked in the government sector, and earned RM10,970 or less.

## Comparison of Barrier Levels in Fruits and Vegetables Intake

	Personal	Environmental	Behavioural
Fruits	Low (2.20 $\pm$ 0.62)*	Moderate (2.58 $\pm$ 0.59)*	Moderate (2.43 $\pm$ 0.57)*
Vegetables	Low (2.04 $\pm$ 0.62)*	Low (2.10 $\pm$ 0.60)*	Low (2.08 $\pm$ 0.57)*

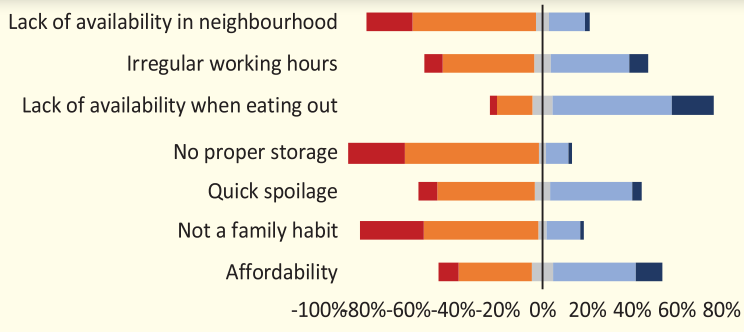
\*Overall mean score

A 5-point Likert scale was used to assess the barriers ("Strongly disagree = 1 point; Disagree = 2 points; Neutral = 3 points; Agree = 4 points; Strongly agree = 5 points"). The mean scores were then categorized into three levels to indicate the degree of perceived barriers:

- 1.00–2.33: Low barrier;
- 2.34–3.66: Moderate barrier;
- 3.67–5.00: High barrier

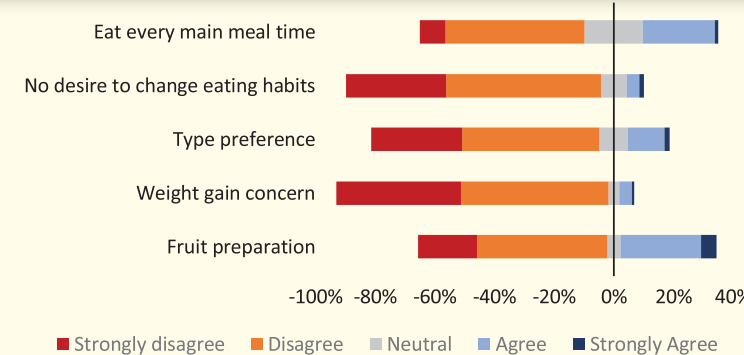
Environmental and behavioural factors have moderate barriers while personal factors pose lesser barrier to fruits consumption. All environmental, behavioural and personal factors have lower challenge to vegetables intake.

### ENVIRONMENTAL barriers to FRUITS consumption



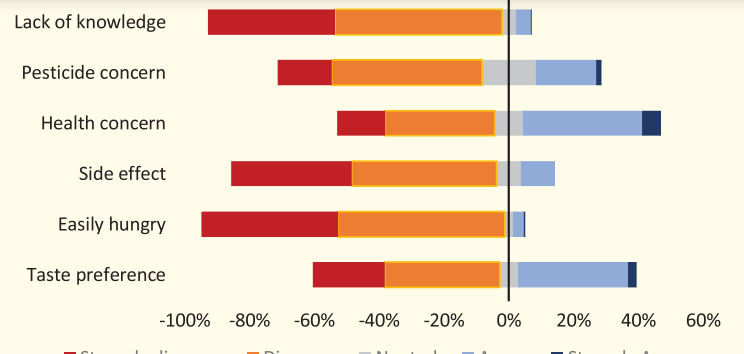
- Overall, **environmental barriers** to fruits consumption are **moderate (2.58 $\pm$ 0.59)**.
- Lack of fruit availability when eating out** was a major concern (Mean: 3.69  $\pm$ 1.05; 72% agreement), followed by **affordability** (Mean: 3.10  $\pm$ 1.23; 48.7%). **Irregular working hours** (Mean: 2.95  $\pm$ 1.19) and **quick spoilage** (Mean: 2.85  $\pm$ 1.14) were moderately reported. Barriers like **family eating habits** (Mean: 2.10  $\pm$ 1.03), **lack of storage** (Mean: 2.02  $\pm$ 0.91), and **neighbourhood availability** (Mean: 2.24  $\pm$ 1.03) were less frequently cited.

### BEHAVIOURAL barriers to FRUITS consumption



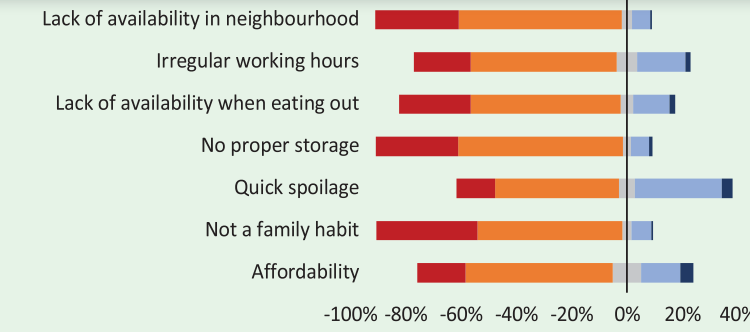
- Overall, **behavioural barriers** to fruits consumption are **moderate (2.43 $\pm$ 0.57)**.
- Eating fruits with every meal was uncommon (Mean: 2.62  $\pm$ 0.98; 55.3% disagreed). **Preparation effort** was a noted barrier (Mean: 2.54  $\pm$ 1.22), while **worry about weight gain** (Mean: 1.73  $\pm$ 0.79), **preference for fast food** (Mean: 2.09  $\pm$ 1.02), and **lack of motivation** (Mean: 1.88  $\pm$ 0.85) were lesser concerns.

### PERSONAL barriers to FRUITS consumption



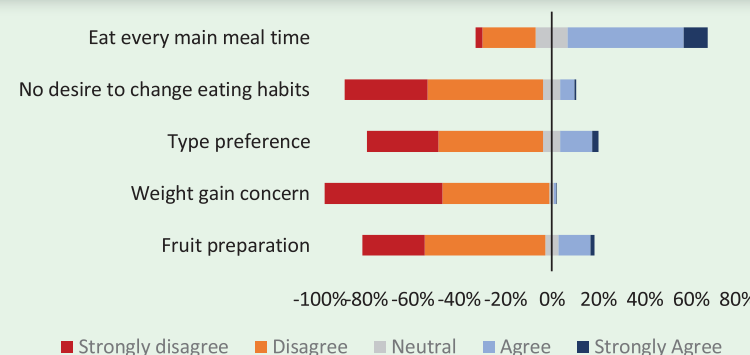
- Overall, **personal barriers** to fruits consumption are **low (2.20  $\pm$ 0.62)**
- Top concerns included **health effects** like increased blood sugar (Mean: 2.85  $\pm$ 1.23), **taste preference** (Mean: 2.59  $\pm$ 1.24), and **pesticide concerns** (Mean: 2.42  $\pm$ 1.03). Lesser barriers were **bad effect** (Mean: 1.91  $\pm$ 0.93), beliefs that fruits **cause hunger** (Mean: 1.69  $\pm$ 0.73), and **lack of knowledge** (Mean: 1.75  $\pm$ 0.77).

### ENVIRONMENTAL barriers to VEGETABLES consumption



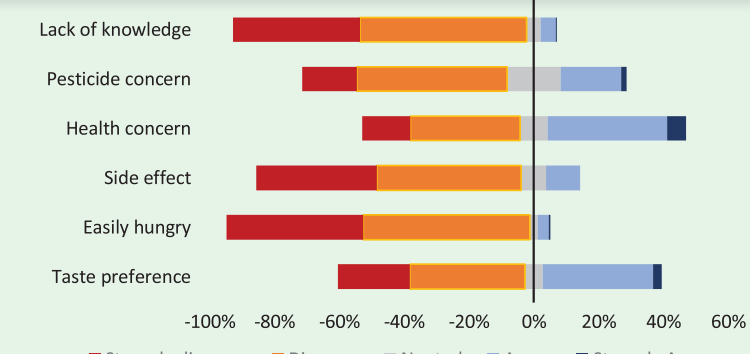
- In contrast, overall, **environmental barriers** to vegetables consumption are **low (2.10 $\pm$ 0.60)**.
- Quick spoilage** was noted (Mean: 2.66  $\pm$ 1.17), though 58.9% disagreed it was a major issue. **Affordability** (Mean: 2.35  $\pm$ 1.07) was also not widely seen as a barrier (70.6% disagreed). Other factors like **irregular working hours** (Mean: 2.27  $\pm$ 1.03), **lack of vegetables at eateries** (Mean: 2.11  $\pm$ 1.01), **storage issues** (Mean: 1.90  $\pm$ 0.84), **limited neighbourhood access** (Mean: 1.89  $\pm$ 0.81), and **family eating habits** (Mean: 1.83  $\pm$ 0.84) had minimal influence on vegetable intake.

### BEHAVIOURAL barriers to VEGETABLES consumption



- Overall **behavioural barriers** to vegetables consumption are **low (2.08 $\pm$ 0.57)**.
- Most respondents regularly ate vegetables with main meals (Mean: 3.42  $\pm$ 1.05; 60.4%). **Cooking time and preference for fast food** (Mean: 2.12) were minor barriers, while **lack of motivation** (Mean: 1.86  $\pm$ 0.86) and **weight gain concerns** (Mean: 1.54  $\pm$ 0.61) were least reported.

### PERSONAL barriers to VEGETABLES consumption



- Overall **personal barriers** to vegetables consumption are **low (2.04  $\pm$ 0.62)**
- Taste preference** (Mean: 2.63  $\pm$ 1.29) and **pesticide concerns** (Mean: 2.41  $\pm$ 1.03) were key issues. Lesser barriers included beliefs that vegetables **cause hunger** (Mean: 1.68  $\pm$ 0.64), **bad effect** (Mean: 1.70  $\pm$ 0.73), and **lack of knowledge** (Mean: 1.77  $\pm$ 0.78).

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