

Supplementary Materials

Validity and reliability of the Malaysian Healthy Diet Online Survey (MHDOS) for assessing diet quality in Malaysian adults

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Supplementary Table 1. Distribution of participants by perceived usability of the MHDOS, survey completion time and survey length (n = 60)

	Mean $\pm$ SD	n (%)
Perceived Usability	64.5 $\pm$ 16.0	
Below average (<68)		36 (60.0%)
Above average ($\geq$ 68)		24 (40.0%)
Survey completion time (minutes)	13.8 $\pm$ 6.8	
Length of the survey		
Too long		18 (10.0)
Too short		1 (1.7)
About right		41 (68.3)

Supplementary Table 2. Characteristics of the participants and total Diet Score by demographic characteristics (N = 315[†]; original dataset without outliers removed)

Characteristics	Count (n)	Percentage (%)	Total Diet Score	
			Mean±SD	p-value
State				
Johor	27	8.6	47.8±16.0	0.279
Kedah	22	7.0	49.0±11.9	
Kelantan	21	6.7	46.1±12.6	
Kuala Lumpur	16	5.1	49.5±14.0	
Labuan	17	5.4	44.1±12.5	
Melaka	28	8.9	45.7±11.7	
Negeri Sembilan	16	5.1	52.6±15.2	
Pahang	25	7.9	53.3±11.8	
Perak	20	6.3	48.5±10.7	
Perlis	16	5.1	50.4±15.2	
Pulau Pinang	16	5.1	52.3±12.3	
Putrajaya	14	4.4	53.1±11.0	
Sabah	18	5.7	43.8±7.9	
Sarawak	19	6.0	52.7±15.2	
Selangor	25	7.9	50.4±10.7	
Terengganu	15	4.8	47.3±12.3	
Age group (years)				
18-19	3	1.0	47.9±15.0	0.001
20-29	114	36.2	46.0±12.7	
30-39	128	40.6	48.9±11.4	
40-49	55	17.5	53.5±13.5	
50-59	15	4.8	57.1±15.8	
Sex				
Male	95	30.2	47.8±12.8	0.261
Female	220	69.8	49.6±12.9	
Ethnicity				
Malay	190	60.3	48.6±12.6	0.029
Chinese	68	21.6	52.9±14.3	
Indian	18	5.7	47.2±8.1	
Bumiputera of Sabah	30	9.5	45.8±12.1	
Bumiputera of Sarawak	9	2.9	43.0±9.2	
Highest educational level				
Secondary	167	53.0	48.1±12.9	0.162
Tertiary	148	47.0	50.1±12.7	
Occupation group				
Managers	10	3.2	46.7±10.5	0.316
Professionals	141	44.8	50.6±13.6	
Technicians & associate professionals	31	9.8	44.3±9.8	
Clerical support workers	38	12.1	48.3±13.8	
Student	42	13.3	50.0±13.0	
Elementary occupations	4	1.3	47.9±1.7	
Service & sales workers	22	7.0	44.9±12.7	
Homemaker	7	2.2	49.8±11.7	
Unemployed	13	4.1	48.0±13.3	
Others	7	2.2	53.8±3.9	
Physical activity level				
Low active	123	39.0	46.7±12.1	0.036
Moderately active	151	47.9	50.3±12.6	
Active	41	13.0	51.1±14.7	
BMI status				
Underweight (<18.5 kg/m ²)	13	4.1	43.9±14.2	0.331
Normal weight (18.5-24.9 kg/m ²)	148	47.0	50.1±14.2	
Overweight (25.0-29.9 kg/m ²)	91	28.9	48.5±11.9	
Obesity (≥30 kg/m ²)	63	20.0	48.3±10.0	

[†]One participant was excluded due to incomplete data.

Supplementary Table 3. Total Diet Score and components scores, test-retest reliability, and Spearman correlation coefficient between MHDOS1 and MHDOS2 (N = 315†; original dataset without outliers removed)

	MHDOS1		MHDOS2		Test-retest reliability‡		Correlation§	
	Mean	SD	Mean	SD	ICC	95% CI	r	p-value
Total Diet Score (out of 100)	49.0	12.8	49.5	13.2	0.89	0.76-0.84	0.78	<0.001
Component Scores (out of 100)								
Vegetables	62.6	33.7	60.5	34.6	0.75	0.68-0.80	0.59	<0.001
Fruits	37.8	32.3	39.0	34.0	0.82	0.78-0.86	0.71	<0.001
Rice, other cereals, whole grain cereal-based products & tubers	54.3	23.5	52.2	23.7	0.70	0.63-0.76	0.55	<0.001
Fish, poultry, eggs, meat & legumes	45.7	20.2	45.2	20.9	0.78	0.73-0.83	0.65	<0.001
Milk & milk products	20.4	21.9	20.8	22.6	0.85	0.81-0.88	0.75	<0.001
Fluids	87.5	16.5	89.0	14.9	0.80	0.75-0.84	0.78	<0.001
Healthy fats	61.0	24.9	60.0	24.3	0.84	0.80-0.87	0.70	<0.001
Discretionary/snack foods	35.6	35.8	40.1	36.5	0.86	0.82-0.89	0.75	<0.001
Variety	49.8	12.3	48.0	13.1	0.73	0.67-0.79	0.57	<0.001

CI, confidence interval; ICC, intraclass correlation coefficient; MHDOS1, first administration of MHDOS; MHDOS2, second administration of MHDOS; SD, standard deviation.

†One participant was excluded due to incomplete data.

‡ICC calculated using a two-way mixed model, type: absolute agreement.

§Spearman correlations

Supplementary Table 4. Comparison of food group intakes estimated from MHDOS1 and 24DR (N = 315†; original dataset without outliers removed)

MHDOS components	Intake (servings/d)				Difference (servings/d)‡		Correlation§	
	MHDOS1		24DR		MHDOS1 v. 24DR		r	p-value
	Mean	SD	Mean	SD	Mean	p-value		
Vegetables	3.2	4.1	1.5	1.5	1.6	< 0.001	0.32	<0.001
Fruits	1.0	1.7	0.7	1.0	0.4	<0.001	0.39	<0.001
Rice, other cereals, whole grain cereal-based products & tubers	4.1	3.8	2.8	1.3	1.2	<0.001	0.24	<0.001
Fish, poultry, eggs, meat & legumes	3.5	4.4	2.2	1.2	1.3	<0.001	0.21	<0.001
Milk & milk products	0.7	1.8	0.2	0.4	0.6	<0.001	0.36	<0.001
Fluids	8.9	4.6	6.6	3.2	2.3	<0.001	0.17	<0.001
Discretionary/snack foods	3.0	7.0	2.7	2.7	0.4	0.024	0.27	<0.001

24DR, single 24-hour diet recall; MHDOS1, first administration of MHDOS; SD, standard deviation.

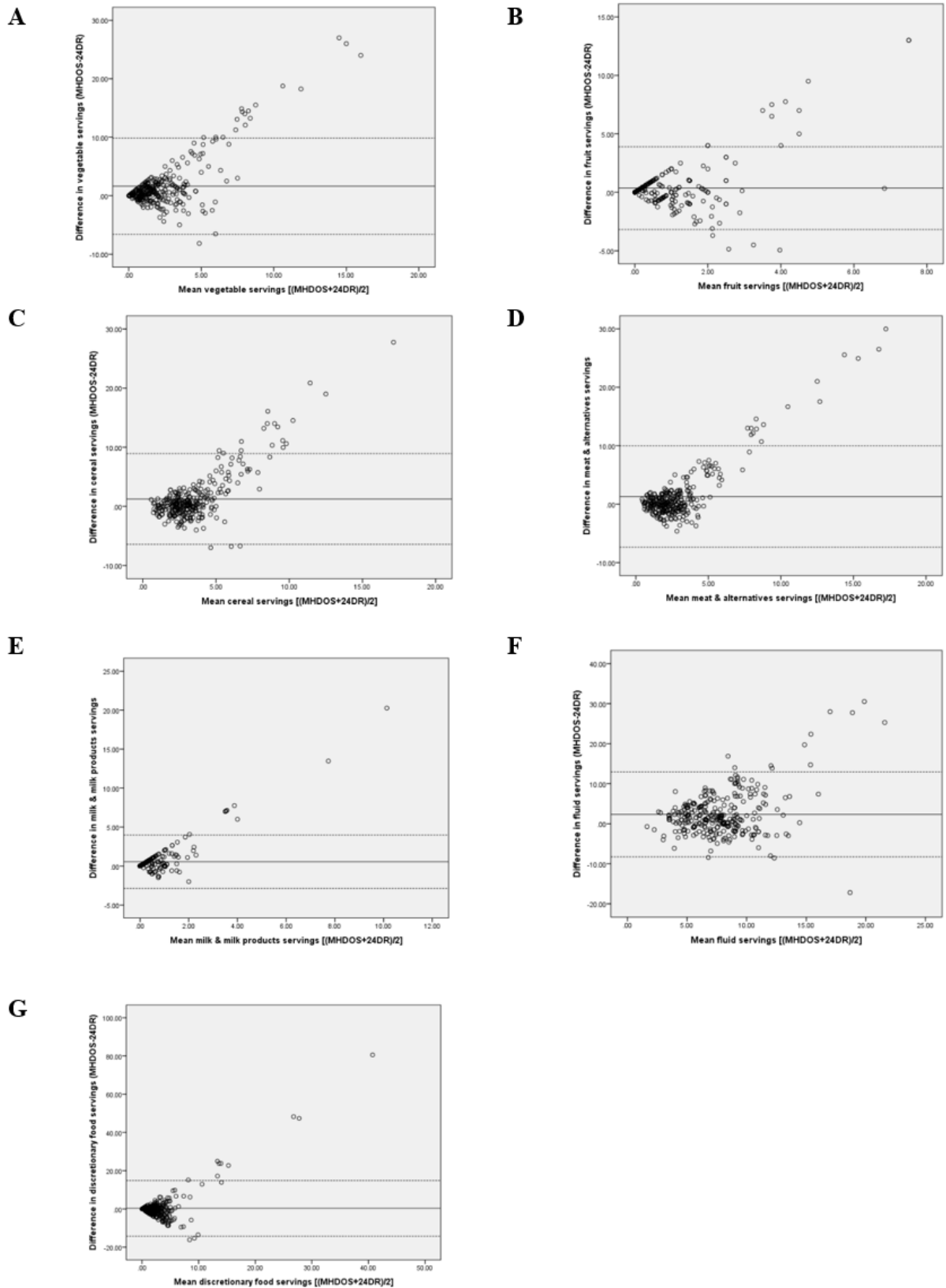
†One participant was excluded due to incomplete data.

‡Wilcoxon signed-rank test.

§Spearman correlations

Supplementary Table 5. Food groups intake according to distribution of total Diet Score tertiles (N = 315†; original dataset without outliers removed)

	Tertiles of total Diet Score [‡]			<i>p</i> for trend [§]
	Low (16.9-42.7)	Medium (42.8-53.9)	High (54.0-88.4)	
Food groups (servings/day)				
Vegetables	1.1	1.4	2.1	<0.001
Fruits	0.4	0.7	1.0	<0.001
Rice & cereals	3.0	2.8	2.7	0.108
Meat & alternatives	2.2	2.0	2.4	0.111
Milk & milk products	0.2	0.2	0.2	0.099
Fluids	5.8	6.6	7.4	0.001
Discretionary foods	3.1	2.9	2.0	<0.001
Energy and nutrients [¶]				
Energy (kcal)	1865	1853	1787	0.361
Protein (g)	60.1	57.5	6.8	0.245
Carbohydrate (g)	217.1	207.4	210.0	0.290
Fat (g)	69.5	74.6	71.1	0.712
Total fibre (g)	6.7	7.1	10.2	<0.001
Vitamin A (ug)	656.2	603.3	668.1	0.144
Vitamin C (mg)	80.1	102.4	165.6	<0.001
Thiamin (mg)	0.7	0.7	0.9	<0.001
Riboflavin (mg)	1.1	1.0	1.2	0.024
Niacin (mg)	9.0	8.2	10.5	<0.001
Sodium (mg)	2882.1	3050.5	3349.2	0.018
Potassium (mg)	981.0	1058.4	1352.6	<0.001
Calcium (mg)	437.3	421.8	484.8	0.001
Phosphorus (mg)	583.6	592.4	679.7	<0.001
Iron (mg)	12.5	11.9	14.6	0.001



Supplementary Figure 1. Bland-Altman plot showing the mean bias and 95% limits of agreement between the MHDOS and 24DR. (A) Vegetables. (B) Fruits. (C) Rice & cereal. (D) Meat & alternatives intakes. (E) Milk & milk products. (F) Fluids. (G) Discretionary foods.