

# COMPARISON OF EATING BEHAVIOUR AMONG CHILDREN AGED 2 - 11 YEARS IN MALAYSIA DURING THE FIRST TWO PHASES OF MOVEMENT CONTROL ORDER

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## Abstract

**Background:** To date, the Malaysian government has implemented three nationwide lockdowns (Movement Control Order, MCO) to mitigate the spread of COVID-19 transmission. It is predicted that children's eating behaviour could be different due to the sudden change in daily routine and school closure during the pandemic. Therefore, this study aims to compare the children's eating behaviour during the implementation of MCO 1.0 and MCO 2.0.

**Methods:** Children's eating behaviour during the lockdowns was assessed with a 35-item validated Children's Eating Behaviour Questionnaire (CEBQ).

**Results:** Children in Malaysia attained significantly higher mean scores ( $p < 0.05$ ) in food responsiveness, enjoyment of food, and desire to drink subscales in MCO 2.0 than that of MCO 1.0. Conversely, significantly lower mean scores ( $p < 0.05$ ) were observed in satiety responsiveness and slowness in eating subscales during the MCO 2.0 compared to MCO 1.0.

**Conclusion:** Children residing in Malaysia had higher food responsiveness, food enjoyment, desire to drink, and eating speed during the MCO 2.0 than MCO 1.0. The findings of this study may be useful for the policymakers in formulating healthy eating intervention strategies in the post-COVID-19 era.

**Keywords:** Eating Behaviour, Children, COVID-19, Lockdown

## Introduction

The Malaysian government has implemented three nationwide lockdowns or Movement Control Orders (MCOs) to curb the spread of COVID-19 transmission. The first phase of MCO (MCO 1.0) came into effect from March 18, 2020 until May 3, 2020 with several extensions made in between (1). The Movement Control Order 2.0 (MCO 2.0) was re-imposed on January 13, 2021, after seeing a big jump in the number of COVID-19 confirmed cases (2, 3). All learning institutions were ordered to close in the MCO 1.0 due to difficulty exercising social distancing; however, schools were re-opened for students sitting for the national examination during the MCO 2.0 (4, 5).

Findings of a few studies revealed that the COVID-19 home confinement has significantly impacted children's eating behaviour. Children living in France, for example,

were reported to have a greater appetite, food enjoyment, food responsiveness, and emotional overeating during the lockdown (6). To date, there is no study comparing the eating behaviour of children living in Malaysia during the three nationwide lockdowns. Therefore, the current study aims to investigate the difference in the eating behaviour of Malaysian children during the MCO 1.0 and MCO 2.0.

## Methodology

Data collection for this cross-sectional study was conducted during the enforcement of the MCO 1.0 (April-May 2020) and the MCO 2.0 (January 2021). The current study adopted purposive and snowball sampling approaches to enrol prospective parents of Malaysian children aged 2-11 years. An online parent-administered questionnaire was hosted on google forms and circulated to the parents via

social media platforms, including Facebook, WhatsApp, Instagram, Twitter, and TikTok.

Parents with at least one child between the ages of 2-11 years old, residing in Malaysia, able to understand and converse English were recruited in this study. The age and gender of the surveyed child were parent-reported, while the eating behaviour was assessed using a validated 35-item Children's Eating Behaviour Questionnaire (CEBQ) (7).

All items were further classified into eight eating behaviour subscales (Table 1) that were rated on a 5-point scale ranging from "never" to "always". A high mean score in a subscale implies that children are more likely to engage in the respective eating behaviour (1). Ethical approval was obtained from the Management and Science University Research Ethics Committee Research Ethics Committee with the reference number MSU-RMC-02/FR01/02/L2/005.

**Table 1:** Comparison of the eating behaviour of children residing in Malaysia during the Movement Control Order 1.0 (MCO 1.0) and Movement Control Order 2.0 (MCO 2.0)

Eating behaviour subscale	Movement Control Order 1.0 (n=117)	Movement Control Order 2.0 (n=117)	t-value <sup>3</sup>	p-value
	Mean ± standard deviation	Mean ± standard deviation		
Food responsiveness, FR	2.70 ± 0.72 <sup>a</sup>	3.13 ± 0.80 <sup>b</sup>	-4.390	<0.001
Emotional over-eating, EOE	2.31 ± 0.71 <sup>a</sup>	2.45 ± 0.71 <sup>a</sup>	-1.540	0.125
Enjoyment of food, EF	3.44 ± 0.80 <sup>a</sup>	3.79 ± 0.62 <sup>b</sup>	-3.709	<0.001
Desire to drink, DD	3.16 ± 0.76 <sup>a</sup>	3.39 ± 0.72 <sup>b</sup>	-2.414	0.017
<b>Food approach behaviour<sup>1</sup></b>	2.90 ± 0.54 <sup>a</sup>	3.19 ± 0.52 <sup>b</sup>	-4.203	<0.001
Satiety responsiveness, SR	3.09 ± 0.62 <sup>a</sup>	2.85 ± 0.58 <sup>b</sup>	3.057	0.002
Slowness in eating, SE	3.07 ± 0.76 <sup>a</sup>	2.78 ± 0.80 <sup>b</sup>	2.863	0.005
Emotional under-eating, EUE	3.15 ± 0.71 <sup>a</sup>	2.99 ± 0.68 <sup>a</sup>	1.813	0.071
Food fussiness, FF	3.01 ± 0.75 <sup>a</sup>	2.92 ± 0.69 <sup>a</sup>	0.878	0.381
<b>Food avoidance behaviour<sup>2</sup></b>	3.08 ± 0.50 <sup>a</sup>	2.88 ± 0.45 <sup>b</sup>	3.128	0.002

<sup>1</sup>Food approach behaviour is the average of FR, EOE, EF, and DD subscales

<sup>2</sup>Food avoidance behaviour is the average of SR, SE, EUE, and FF subscales

<sup>3</sup>Mean difference was analysed with independent-samples t-test

<sup>a,b</sup>Different alphabet in the same row indicates significant difference at  $p < 0.05$

### Statistical analysis

Data analysis was conducted using IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, US). Socio-demographic characteristics were reported as frequency and percentage. The score of eating behaviour subscales was expressed as mean and standard deviation (SD). The mean difference was analysed using independent samples t-test, wherein a  $p$ -value of less than 0.05 ( $p < 0.05$ ) was statistically significant.

### Results

A total of 350 parents of children aged 2-11 years responded to this survey, comprising 204 parents in the MCO 1.0 and 146 parents in the MCO 2.0. The age and gender of children in the MCO 2.0 were matched with those in the MCO 1.0. As a result, 117 matched pairs were identified for statistical analysis. Of the 234 surveyed children, there were 50.4% boys ( $n=118$ ) and 49.6% girls ( $n=116$ ), with a mean age of  $6.59 \pm 2.43$  years old.

Table 1 depicts the eating behaviour of Malaysian children aged 2-11 years during the MCO 1.0 and the MCO 2.0. It is observed that the children had significantly higher mean scores ( $p < 0.05$ ) in food responsiveness (FR= $3.13 \pm 0.80$ ), enjoyment of food (EF= $3.79 \pm 0.62$ ) and desire to drink (DD= $3.39 \pm 0.72$ ) subscales in the MCO 2.0 than that of MCO 1.0 (FR= $2.70 \pm 0.72$ , EF= $3.44 \pm 0.80$  and DD= $3.16 \pm 0.76$ ). The mean score of emotional over-eating was slightly higher in the MCO 2.0 (EOE= $2.45 \pm 0.71$ ) compared to the MCO 1.0 (EOE= $2.31 \pm 0.71$ ); however, no significant difference was noted in the mean scores of EOE in both phases. Overall, children demonstrated a stronger display ( $t = -4.203$ ,  $p < 0.001$ ) in food approach behaviour during the MCO 2.0 ( $3.19 \pm 0.52$ ) than the MCO 1.0 ( $2.90 \pm 0.54$ ).

On the other hand, emerging findings also revealed that children attained significantly lower mean scores ( $p < 0.05$ ) in satiety responsiveness (SR= $2.85 \pm 0.58$ ) and slowness in eating (SE= $2.78 \pm 0.80$ ) subscales during the MCO 2.0 (MCO 1.0: SR= $3.09 \pm 0.62$  and SE= $3.07 \pm 0.76$ ). Nevertheless,

it is also noteworthy to mention that the mean scores of emotional under-eating (MCO 1.0: EUE=3.15 ± 0.71; MCO 2.0: EUE=2.99 ± 0.68) and food fussiness (MCO 1.0: FF= 3.01 ± 0.75; MCO 2.0: FF=2.92 ± 0.69) subscales were comparable ( $p>0.05$ ) in both phases. In general, the mean score of food avoidance behaviour was significantly lower ( $t= 3.128, p= 0.002$ ) in the MCO 2.0 (2.88 ± 0.45) compared to the MCO 1.0 (3.08 ± 0.50).

## Discussion

The CEBQ was previously adopted in the South-East Asian Nutrition Survey Malaysia (SEANUTS Malaysia) to assess the eating behaviour of Malaysian children aged 7-12 years (8). The scores in the food responsiveness (FR), emotional over-eating (EOE), enjoyment of food (EF), and desire to drink (DD) subscales were reported to be in the range of FR=2.44-2.58, EOE=1.47-1.51, EF=3.61-3.80 and DD=3.03-3.20, respectively. When comparing emerging findings to those of SEANUTS Malaysia, it must be pointed out that children attained higher scores in food responsiveness and emotional over-eating subscales during the enforcement of MCO 1.0 and MCO 2.0. The score in the enjoyment of food subscale was relatively lower during the MCO 1.0 enforcement; however, it turned out to be comparable with those reported in SEANUTS Malaysia in the MCO 2.0. On the other hand, the mean scores for the desire to drink subscale were fairly similar to those previously reported in the national representative samples. Nevertheless, it is observed that the four eating subscales of food avoidance behaviour had higher mean scores compared to those reported in SEANUTS Malaysia (SR=2.30-2.58, SE=2.31-2.70, EUE=2.42-2.66 and FF=2.60-2.86).

These findings suggested that children were more responsive to external food cues and more likely to increase the frequency of eating during the MCOs enforcement. The COVID-19 lockdown led to increased snacking due to poor response to food commercials on social media platforms and altered food consumption patterns in response to boredom, anxiety, or stress (9). Interestingly, children in the current study displayed a lesser interest in foods in the MCO 1.0, but slowly improved in the MCO 2.0. The decline in food interest and speed in eating during the MCOs can be attributed to children were struggled to adapt to the new normal of the COVID-19 pandemic, such as virtual learning and movement restriction orders enforced by the local government.

The surveyed children generally demonstrated slightly higher mean scores in food responsiveness, food enjoyment, desire to drink, and eating speed in the MCO 2.0. It could be attributed to the fact that these children may have already adjusted to the new normal in MCO 2.0. In Brazil, de Menezes et al. (10) investigated the eating behaviour of preschool-age children (2-6 years old) during the first wave of the COVID-19 pandemic. Interestingly, higher mean scores in food responsiveness, enjoyment of food, desire to drink, and emotional over-eating subscales were observed in children residing in Malaysia during the COVID-19 home confinement than those reported in Brazil.

Apart from the COVID-19 lockdown, parental income, feeding practice, nutrition knowledge, and household food security are among the many factors that influence children's eating behaviour (11, 12). Therefore, it could be interesting to establish the relationships between these factors and children's eating behaviour through cohort study in the future.

The findings presented in the current study must be interpreted within the context of limitations. The utilization of a web-based data collection approach has apparently ruled out those parents without internet access during the lockdowns. Therefore, findings in the current study might not sufficiently represent the eating behaviour of all Malaysian children during the pandemic. Nevertheless, the current study is the first to compare children's eating behaviour during the nationwide lockdowns.

## Conclusion

In conclusion, children residing in Malaysia had higher food responsiveness, food enjoyment, desire to drink, and eating speed during the MCO 2.0 than MCO 1.0. Although it presents some limitations, the current study provided an overview concerning children's eating behaviour in Malaysia during the nationwide lockdowns. The findings of this study may be useful for the policymakers in formulating healthy eating intervention strategies in the post-COVID-19 era.

## Competing interests

The authors declare that they have no competing interests.

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