THE NUTRITIONAL STATUS OF CHILDREN WITH DISABILITY AND THEIR PARENTAL FEEDING PRACTICES, FOOD SHOPPING MOTIVATION AND STRESS LEVEL AT MEALTIME DURING COVID-19 PANDEMIC

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Abstract

Introduction: This study intends to identify the current nutritional status of children with disability and the pattern of their parent's feeding practices, food shopping motivation and stress level at mealtime during the Covid-19 pandemic. **Methods:** Fifty-eight caregivers participated in this study by completing a validated online questionnaire survey (e.g., FFQ, HomeSTEAD, Parental Food Shopping Motivation and Parental Stress Level). The children's weight and height were measured and self-reported by the caregivers. Data were descriptively analysed. Open-ended questions about dietary and feeding practice changes were examined using thematic analysis. **Results:** Caregivers reported changes in the children's daily intake, feeding practices and shopping motivations during the Covid-19 pandemic. Particularly, disruption to the routines of the children has led to an increase in their daily consumption. Caregivers were reported to change their feeding practices by being more stringent with comfort foods, implementing restrictions on unhealthy foods, and encouraging kid autonomy in food selection. As a result, many of them purchase meals that are healthier and preferred by their children. During the pandemic, food prices become the primary shopping motivation. In this study, however, caregivers reported feeling less stressed at mealtimes. **Conclusions:** This study provides insight into the condition of children with a disability during the pandemic. Notable changes were found in their dietary habits and parental feeding practices.

Keywords: Children with Disability, Feeding Practices, Food Shopping Motivation, Stress level

Introduction

In Malaysia, the first incidence of Covid-19 was reported around the end of January 2020. Malaysia has issued a Movement Control Order (MCO) in response to the increasing number of incidents (Elengoe, 2020). As a result of the pandemic, Malaysia has enacted and implemented several measures to prevent the spread of the virus, including social gathering limitations and border closures. This new lifestyle has altered socioeconomic status, mental health, and the occurrence of other issues, particularly among vulnerable individuals. Access to healthcare is becoming more limited as a result of MCO, which has numerous implications on children, especially those who have disabilities. (UNICEF, 2019). Subsequently, caregivers of disabled children face additional stress in adjusting to the new norm while also providing a safe environment for the children.

The nutritional status of children with physical, mental, or intellectual disabilities has always been recognised as a prevalent issue related to their impairment. Approximately 5.7% of children with disabilities were underweight, 17.1% were overweight, and 7.2% were obese (Sari and Bahceci, 2012). Due to the needs of these children in the care, medical and rehabilitation, caregivers of children with disabilities reported a greater burden (Bahry et al., 2012). According to a recent study by Mbazzi et al. (2021), families with impaired children encountered difficulties during the pandemic, especially on the psychosocial shifts and food shortages, which raised parental stress. It was revealed that the majority of families ration their food, skip meals, and rely on food handouts from neighbours and parent support group members. This circumstance affected not just the dietary state of the families but also their health and relationships.

With the onset of the pandemic, it is anticipated that parental food shopping motivation will also shift. While Van der Werf et al. (2021) mentioned that the introduction of Covid-19 has prompted people to eat healthier. Nonetheless, Philippe and colleagues (2021) stated that the lockdown has resulted in changes in parental feeding practices that are more child-centred and pleasure-oriented. The unusual situation caused parents to disregard the usual rules and prioritise enjoyment and comfort at home.
In Malaysia, the majority of research on the impact of Covid-19 on health outcomes has concentrated on mental health and societal issues. Hence, this study intends to determine the nutritional status of children with disabilities as well as parents' feeding patterns, food purchasing motivation, and mealtime stress during the Covid-19 pandemic.

Methods

Subjects

Convenience sampling was used in this study. The survey was distributed through social media platforms such as WhatsApp, Facebook, Instagram and Twitter. A total of 58 caregivers and their children with disability aged 3 to 12 years old were recruited for this study. The ethical approval was acquired from Kulliyyah Postgraduate and Research

Committee (KPGRC) and the International Islamic University Malaysia Research Ethical Committee (IREC). The participants consented to the study procedures before completing the survey.

Anthropometric measurement

The anthropometric measurements include the height and weight of the children, which are self-measured by their caregivers. The height was measured in centimetres (cm) using a measuring tape, while weight was measured in kilogram (kg) using a weighing scale. For children who cannot stand on their own, their weight was taken along with the caregiver. The total weight was then subtracted from the parent's weight to determine the weight of the children. The WHO Anthroplus was used to calculate the z-scores of BMI-for-age, height-for-age, and weight-for-age, and their nutritional status was classified using the WHO Child Growth Standard (2008).

Dietary Assessment

The Food Frequency Questionnaire (FFQ) from the Malaysian Adult Nutrition Survey (MANS, 2003) was used to conduct the dietary assessment. There was a total of 16 questions from 8 food groups. Caregivers were asked to report the children's frequency of food intake and portion size using household measurements. The total energy, macronutrient and micronutrient intake were calculated using Nutritionist Pro (Axxya Systems LLC, USA). An open-ended question on the children's changes in dietary assessments during Covid-19 was also asked.

Parental Feeding Practices

The questionnaire for parental feeding practices was adapted from the Home Self-Administered Tool for Environmental Assessment of Activity and Diet Family Food Practices Survey (HomeSTEAD) (Vaughn et. al., 2017). The questionnaire includes 26 questions about coercive control practices (CCP), structure practices (SP), and autonomy support practices (ASP). On a three-point scale, caregivers were asked to rate their responses (Never, Sometimes, Always). Higher scores indicated the use of more soothing foods, more child autonomy, more rules and limits, a stricter meal setting, and a more positive meal atmosphere. An open-ended question was asked about how their feeding habits changed during Covid-19.

Parental Food Shopping Motivation

The parental food shopping motivation questionnaire was adapted from Rigal et al (2012). The questionnaire includes 17 questions about convenience, weight control, natural products, health control, preferences, and price. Caregivers rated their food shopping motivation on a 3-point Likert scale during Covid-19 (i.e., wrong for me, neutral and true for me). A higher score indicates higher awareness and motivation while shopping. An

open-ended question about how their food shopping motivations changed during Covid-19 was asked.

Parental Stress Level

Caregivers were asked how often they feel stress during food preparation and mealtime during Covid-19. The answer was rated using a three-point Likert scale (i.e., never, sometimes and always). Higher scores indicate higher stress levels during food preparation and mealtime. Furthermore, an open-ended question was asked about any changes in stress levels during the pandemic.

Statistical Analysis

Statistical analysis was conducted using Statistical Package for the Social Sciences (SPSS) (IBM, USA) version 23.0. Descriptive analysis was used to analyse the data of socio-demographic information, anthropometry, dietary intake of children with disability and their parental feeding practices, food shopping motivation and stress level during the Covid-19 pandemic. Simple thematic analysis was used to examine responses to open-ended questions about changes in dietary and eating habits.

Result

Sociodemographic Data

A total of 58 caregivers participated in this study, of which 24.1% (n=14) were males, and 75.9% (n=44) were females. Most caregivers were married (93.1%, n=54) while 6.9% (n=4) were divorced. Most caregivers aged between 35 and 40 years old (53.4%, n=31).

Table 1: Sociodemographic characteristics of the caregiver (N=58)

Characteristics	n (%)
Gender	
Male	14 (24.1)
Female	44 (75.9)
Age	
20-34 years	15 (25.9)
35-40 years	31 (53.4)
50-64 years	12 (20.7)
Marital status	
Married	54 (93.1)
Divorcee	4 (6.9)
Working status before Covid-19	
Working	45 (77.6)
Not working	13 (22.4)
Working status after Covid-19	

Working	41 (70.7)
Not working	17 (29.3)
Household Income	
B40 (< RM 4850)	23 (39.7)
M40 (RM 4850 - RM10959)	23 (39.7)
T20 (> RM10959)	12 (20.7)

Table 2 shows the children's sociodemographic characteristics. This study included 58 children with disabilities ranging in age from 3 to 12. There are 31% (n=18) of children with Down Syndrome, 31% (n=18) with autism spectrum disorder, 22.4% (n=13) with attention deficit hyperactivity disorder (ADHD), and 15.5% (n=9) with other types of disability.

Table 2: Sociodemographic characteristics of the children (N=58)

Characteristics	n (%)
Gender	
Male	37 (63.8)
Female	21 (36.2)
Age	
3-5 years	17 (29.3)
6-10 years	25 (43.1)
11-12 years	16 (27.6)
Type of disabilities	
Attention Deficit Hyperactive Disorder (ADHD)	13 (22.4)
Autism Spectrum Disorder (ASD)	18 (31.0)
Down Syndrome	18 (31.0)
Others	9 (15.5)

Anthropometric Measurements

Table 3 represents the mean for anthropometric measurements of the respondents. The means for weight was 35.39 kg (SD±21.59), and height was 129.15 cm (SD±25.23). Their mean z-scores for BMI-for-age, height-for-age, and weight-for-age were 1.49 (SD±4.82), 0.39 (SD±3.11) and 1.02 (SD±2.57), respectively. In this study, 19% (n=11) of children were obese, 12% (n=7) were overweight, 10% (n=6) were stunted, and 7% (n=4) were underweight.

Table 3: Anthropometric measurement of respondents

	n (%)	Mean	Standard Deviation
Weight		35.39	21.59
Height		129.15	25.23
Z-score			
BAZ		1.49	4.82
HAZ		0.39	3.11

WAZ		1.02	2.57
Nutritional status (BMI for Age)			
Obese	11 (19.0)		
Overweight	7 (12.1)		
Normal	31 (53.4)		
Nutritional status (Height for Age)			
Normal	52 (89.7)		
Stunted	6 (10.3)		
Nutritional status (Weight for Age)			
Normal	38 (65.5)		
Underweight	4 (6.9)		

Dietary Assessment

Table 4 shows the mean macronutrient and micronutrient intakes of the participants, including total energy, carbohydrate, protein, fat, Vitamin C, Vitamin B6, Vitamin B12, iron, zinc, and calcium. The mean total energy intake was 1307.83 kcal (SD±1002.13). The mean for carbohydrate, protein and fat intakes were 169.21 g (SD±139.09), 67.57g (SD±57.55) and 37.81g (SD±34.04), respectively. In terms of micronutrients intake, the mean for Vitamin C, Vitamin B6, Vitamin B12, zinc and calcium were 27.38 mg/day (SD±39.47), 1.11 mg/day (SD± 0.94), 7.14 µg/day (SD±10.35), 8.37 mg/day (SD±7.74) and 440.75 mg/day (SD±419.51).

Table 4: Dietary assessment of the participants (N=58)

	Mean	**Standard deviation**
Macronutrients		
Calorie (kcal)	1307.83	1002.13
Carbohydrate (g)	169.21	139.09
Protein (g)	67.57	57.55
Fat (g)	37.81	34.04
Micronutrients		
Vitamin C (mg/day)	27.38	39.47
Vitamin B6 (mg/day)	1.11	0.94
Vitamin B12 (µg/day)	7.14	10.35
Zinc (mg/day)	8.37	7.74
Calcium (mg/day)	440.75	419.51

Table 5 shows the mean percentage of micronutrient intake to the RNI by age group. In terms of Vitamin C, children aged 4 – 6 years old achieved 69.67%, 7 – 9 years old achieved 70.27% and 10 – 12 years old achieved 53.43%, respectively. Similarly, for Vitamin B6 intake, children aged 4 – 6 years old achieved 207.89%, 7– 9 years old achieved 96.96% and 10 – 12 years old achieved 86.85%, respectively. The percentage of achieving Vitamin B12 intake

was 608.82% for 4 - 6 years old, 238.89% for 7 - 9 years old and 187.53% for 10 - 12 years old. The percentage of achieving Zinc intake 4 – 6 years old, 7 – 9 years old and 10 – 12 years old were 190.16%, 129.05% and 114.51%, respectively. Concerning calcium intake, the following results were discovered: 4 - 6 years achieved 46.77%, 7 - 9 years achieved 36.7%, and 10 – 12 years achieved 33.99%.

Table 5: Percentage achieving RNI intake according to age groups

Micronutrient	Age group	RNI	Mean (SD)	% Achieving RNI
Vitamin C	4-6 years	30 mg/day	20.90 (41.59)	69.67
	7-9 years	35 mg/day	24.59 (23.70)	70.27
	10-12 years	65 mg/day	34.73 (49.37)	53.43
Vitamin B6	4-6 years	0.6 mg/day	1.25 (0.97)	207.89
	7-9 years	1.0 mg/day	0.97 (0.81)	96.96
	10-12 years	1.3 mg/day	1.13 (1.10)	86.85
Vitamin B12	4-6 years	1.5 µg/day	9.13 (10.32)	608.82
	7-9 years	2.5 µg/day	5.97 (5.89)	238.89
	10-12 years	3.5 µg/day	6.56 (13.36)	187.53
Zinc	4-6 years	5.2 mg/day	9.88 (7.57)	190.16
	7-9 years	5.7 mg/day	7.36 (7.15)	129.05
	10-12 years	7.0 mg/day	8.02 (8.98)	114.51
Calcium	4-6 years	1000 mg/day	467.66 (349.46)	46.77
	7-9 years	1000 mg/day	367.01 (347.73)	36.7
	10-12 years	1300 mg/day	441.85 (503.51)	33.99

Parental Feeding Practices

Table 6 presented the mean scores for parental feeding practices among the caregivers. Parental feeding practices such as soothing with food show a mean score of 3.07 (SD±2.45). In terms of guided choice when what and amount, the mean scores are 3.66 (SD±1.35), 3.43 (SD±1.11), and 4.29 (SD±1.68). Regarding the rules and limits around unhealthy foods, the mean score reported is 2.97 (SD±1.23), while the mean score for the atmosphere of the meals is 3.83 (SD±1.93). Most caregivers stated significant differences between the methods before and during the pandemic.

Table 6: Scores for parental feeding practices (N=58)

Feeding practices	Mean scores	SD
Soothing with food	3.07	2.45
Guided choice- when	3.66	1.35
Guided choice- what	3.43	1.11
Guided choice- amount	4.29	1.68
Rules and limits around unhealthy foods	5.12	1.73
Mealtime setting	2.97	1.23
Atmosphere of meals	3.83	1.93

Parental Food Shopping Motivation

Table 7 shows the scores for parental food shopping motivation. In terms of buying convenient foods, the mean score is 4.17 (SD±1.93). Regarding buying foods that are weight control, natural, and health control, the mean scores are 3.84 (SD±2.24), 4.21 (SD±1.56) and 4.71 (SD±1.61), respectively.

Table 7: Scores for parental food shopping motivation (N=58)

Food shopping motivation	Mean scores	SD
Convenience	4.17	1.93
Weight control	3.84	2.24
Natural	4.21	1.56
Health control	4.71	1.61
Preferences	4.9	1.39
Prices	3.02	1.2

Parental Stress Level

Figure 1 presents the percentage of parental stress levels. From the result, 48.3% (n=28) of caregivers never felt any distress during food preparation and mealtime during Covid-19 compared to before Covid-19. In contrast, 34.5% (n=20) of the caregivers reported that they sometimes experienced stress during food preparation and mealtime during Covid-19. Only 17.2% (n=10) of the caregivers said they were always stressed during food preparation and mealtime during Covid-19.

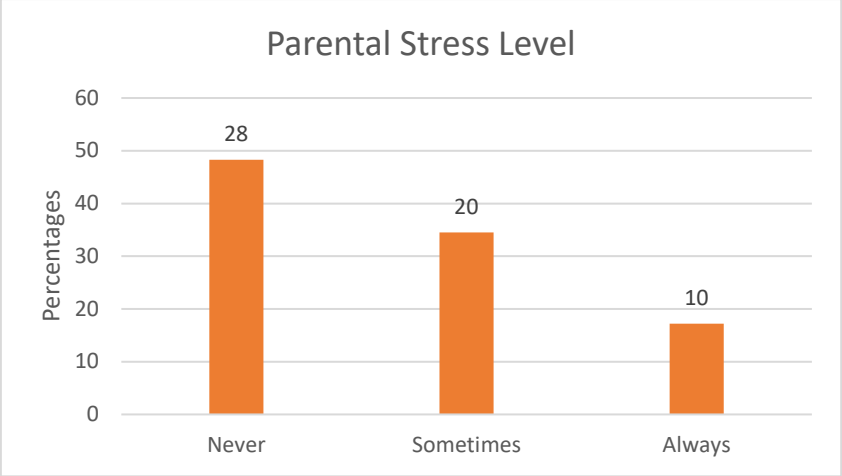

Figure 1: Percentage of parental stress level

Thematic Analysis

Parental Feeding Practices

When asked about the overall feeding practices during Covid-19, most of the caregivers stated no difference between the practices before and during the pandemic. Yet, there are some caregivers who reported the difference in their feeding practices.

ID3: due to the pandemic, the time management and activities around the house have changed, and my child keeps entering the kitchen for food.
ID30: yes, there are absolute differences in food intake that I failed to control.
ID35: I keep giving my children rewards, so they did not interfere with my work.
ID38: My children and I argue more during eating compared to before Covid-19.

Parental Shopping Motivation

Most of the caregivers stated they did not have a significant difference in their food shopping motivation. However, some of them stated the differences that occur during the pandemic.

ID3: Yes, there is a difference since I would buy more stock food than before due to the lockdown and fulfil my children's needs.
ID11: Yes, during the pandemic, I bought lesser foods.
ID57: Yes, during Covid-19, I am more aware of nutrition as I want to increase my children's immune systems.

Parental Stress Level

Most caregivers stated they did not face a difference in stress levels during food preparation and mealtime before and during Covid-19. Caregivers reported a variety of statements; for caregivers who experienced stress, they stated that changes in mealtime patterns and attitudes may be contributing factors to stress during food preparation and mealtime.

ID3: It is quite stressful because I cannot control my children's appetite. This is because they stayed at home most of the time and lack in physical activity.

ID34: I faced more stress than before because the frequency of my children going to the kitchen outside of mealtime for food increased.

Discussion

In this study, children show a significant increase in their nutritional status; over 19% are obese, and 12.1% are overweight. The data is consistent with a study by Sari and Bahceci (2012), where it is stated that children with disability are prone to be on the overweight and obese side. Caregivers reported that their children's weight increases after Covid-19 starts and worsens in the first few months of the outbreak. In this study, food intake generally increased compared to the routine. This situation may be explained by the food intake which is high in protein, such as the intake of meat, poultry and seafood. However, micronutrients such as Vitamin C and calcium intake are considerably low. It suggests that children consume fewer fibre sources high in Vitamin C, such as fruits and vegetables.

The findings revealed that there are partially positive and negative elements in parental feeding practices, in which caregivers show both authoritarian and permissive styles during the Covid-19 pandemic. Regarding soothing with food and rules and limits around unhealthy foods, it is observed that caregivers are stricter on their children. This behaviour may occur due to anxiety about their children's health and immunity during the Covid-19 pandemic. Other than that, the vulnerability and needs of disabled children may become another factor in stricter feeding practices. These findings follow a study by Polfus et al. (2017) whereby having special needs children affects the style of parental feeding practices according to their children's condition.

Regarding the amount of food, the food choices and where the meal takes place, most caregivers show a higher child autonomy and more control decision over their food. This situation is supported by a study by Philippe et al. (2020), which indicates that caregivers are more lenient with types of food and provide more autonomy to the children in their choices during the Covid-19 pandemic.

The result from our study also presented positive motivation that drives parental food shopping behaviour whereby they are likely to buy convenience foods, natural, weight and health-controlling for their children during Covid- 19 pandemic. These results may indicate that caregivers are more aware of the health status of their children. These results are supported by a study done in Italy, where the food choices focusing on health, mood, and weight control during the lockdown produced healthy eating behaviour (Russell, 2014; Snuggs & McGregor, 2020). Besides that, caregivers are highly motivated to buy foods their children prefer. This may be explained by the parental feeding practices where more child autonomy is given to the children. This is supported by a study by Philippe et al. (2021), whereby caregivers could listen to and fulfil the children's requests during the pandemic compared to regular days. Besides, this study also reported that food prices are among the caregivers' highest motivations during food shopping.

Studies showed that caregivers experienced a higher stress level during the Covid-19 pandemic. However, this study demonstrates that only 17.2% of the caregivers faced significant stress during food preparation and mealtime. Alhuzimi (2021) survey supported a positive correlation between parental stress and mental well-being in a family with ASD children. Moreover, the open-ended question on the stress level results reported that some caregivers face a significant stress level and challenging time at mealtime because children are stubborn and refuse to eat. This situation could be one of the contributing factors to caregivers' stress. Nonetheless, these results imply that caregivers have developed a coping mechanism to handle the changes during the Covid-19 pandemic, especially after the lockdown phases. Adams et al. (2021) also observed that caregivers manage the difficulties by increasing quality time with their family and practising the new daily routine with their children over time.

Conclusion

This study provided insight into the current nutritional status of children with disability and their parental feeding practices, food shopping motivation and stress level at mealtime during the Covid-19 pandemic. It is hoped that this study can ignite more studies towards vulnerable groups such as children with disability as it is significant to ensure their positive progression in life. These studies could be reference material for future research regarding children with a disability during the pandemic. This study also provided data from children and caregivers while analysing the behaviour and interpreting the relationship between eating behaviours.

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