Healthy Eating Report Card for Pre-school Children in Hong Kong

Alison WL Wan, Kevin KH Chung, JB Li, Derwin KC Chan *

ABSTRACT

Introduction: This study aimed to develop the Healthy Eating Report Card for Pre-school Children in Hong Kong for evaluating the prevalence of healthy eating behaviours and favourable family home food environments (FHFEs) among pre-school children in Hong Kong.

Methods: In this cross-sectional study, 538 parent-child dyads from eight kindergartens in Hong Kong were recruited. Parents or guardians completed a questionnaire comprising Report Card items. The Report Card included two indicators of Children's Eating Behaviours (ie, Children's Dietary Patterns and Children's Mealtime Behaviours) and three indicators of FHFEs (ie, Parental Food Choices and Preparation, Avoidance of Unhealthy Foods, and Family Mealtime Environments). Each indicator and its specific items were assigned a letter grade representing the percentage of participants achieving the predefined benchmarks. The grades were defined as A (≥80%, Excellent); B (60%-79%, Good); C (40%-59%, Fair); D (20%-39%, Poor); and F (<20%, Very poor). Plus (+) and minus (-) signs were used to indicate the upper or lower 5% of each grade.

Results: Overall, Children's Eating Behaviours were classified as Fair (average grade of 'C'), whereas FHFEs were classified as Good (average grade of 'B'). The sub-grades ranged from 'C' to 'A-', as follows: Children's Dietary Patterns, 'C+'; Children's Mealtime Behaviours, 'C'; Parental Food Choices and Preparation, 'C+'; Avoidance of Unhealthy Foods, 'B'; and Family Mealtime Environments, 'A-'.

Conclusion: The findings highlight areas for improvement in healthy eating among children. The Healthy Eating Report Card could offer novel insights into intervention tools that promote healthy eating.

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New knowledge added by this study

- Eating behaviours among pre-school children in Hong Kong were classified as Fair (average grade of 'C').
- Among those children, family home food environments (FHFEs) were classified as Good (average grade of 'B').
- There is considerable potential for improvement in children's dietary patterns, children's mealtime behaviours, and parental food choices and preparation.

Implications for clinical practice or policy

- The Healthy Eating Report Card for Pre-school Children can be considered a useful tool for evaluating the prevalence of healthy eating behaviours and favourable FHFEs among pre-school children.
- The grades provided by the Report Card offer valuable guidance concerning how healthy eating behaviours and favourable FHFEs among pre-school children could be promoted at the family, school, and community levels.

Introduction

Unhealthy dietary patterns, generally characterised by low dietary diversity, skipping breakfast, low consumption of fruits and vegetables, and frequent consumption of energy-dense/nutrient-poor foods and sugar-sweetened beverages, are common among children worldwide.[1,2] It is particularly important for young children to adopt healthy dietary patterns because eating habits and food preferences in childhood can influence dietary patterns in adulthood.[3] Similar to children in other regions, Hong Kong children have a high prevalence of unhealthy dietary patterns.[4] A cross-sectional survey evaluating infant and young child feeding practices in Hong Kong identified numerous dietary problems, including dietary imbalance (eg, high protein but low fibre intake), overdependence on the use of formula milk, inadequate intake of vegetables and fruits, and unhealthy snacking and sugary beverage habits.[5] A previous study revealed a need for dietary improvement among Hong Kong pre-school children.[6] Key recommendations included

香港學前兒童健康飲食報告卡

尹詠霖、鍾杰華、黎建斌、陳勁聰

引言：本研究旨在制訂香港學前兒童健康飲食報告卡，以評估香港學前兒童健康飲食行為和家庭家居飲食環境狀況。

方法：在這項橫斷面研究中，我們從香港八間幼稚園招募了538名家長及其子女。家長或監護人需填寫包括了報告卡項目的問卷。報告卡包括兩項兒童飲食行為指標（即兒童的飲食模式和兒童的用餐行為）和三項家庭家居飲食環境指標（即父母的飲食選擇和準備、避免不健康的食物以及家庭用餐環境）。每個指標及其具體項目均被分配一個字母等級，代表達到預先定義基準的參加者的百分比。等級定義為A（≥80%，優秀）；B（60%-79%，良好）；C（40%-59%，尚可）；D（20%-39%，欠佳）；F（<20%，差劣）。加號和減號用於表示每個等級的上或下5%。

結果：整體而言，兒童的飲食行為被分類為尚可（平均等級為C），而家庭家居飲食環境被分類為良好（平均等級為B）。指標等級從C到A-，如下所示：兒童的飲食模式獲得C+；兒童的用餐行為獲得C；父母的飲食選擇和準備獲得C+；避免不健康的食物獲得B；家庭用餐環境獲得A-。

結論：研究結果強調了兒童健康飲食方面需要改進的地方。健康飲食報告卡能夠為促進健康飲食提供新的介入工具和見解。

a balanced diet, better nutritional adequacy, and greater independence during mealtimes (ie, self-feeding).[6] Indeed, inappropriate behaviours during mealtimes, such as lack of self-feeding, food refusal, picky eating, and prolonged meals, are common in young children.[7,8] Children with inappropriate mealtime behaviours may be susceptible to insufficient nutrient and/or energy intake.[9] However, there is limited information available regarding the mealtime behaviours of typically developing pre-school children in Hong Kong.

Family home food environments (FHFEs), ie, parental food choices and preparation, avoidance of unhealthy foods, and family mealtime environments, have strong associations with children's dietary habits and body weight.[10-12] Parental use of nutrition labels to make healthier food choices has been linked to a lower probability of overweight or obesity in their children.[13] Similarly, children with limited access to unhealthy foods are reportedly more likely to maintain a normal body weight.[14] A review focusing on the effects of family and social environment on children's dietary patterns found that a structured mealtime environment—namely, regular meals with family members and screen-free mealtimes—was associated with healthy food consumption patterns in children.[15] In summary, children's mealtime behaviours and FHFEs are important for healthy eating among young children. Thus far, no studies have provided an overview of eating behaviours and FHFEs among pre-school children in Hong Kong.

The use of a report card at the country-/region-level can provide a valuable overview of the prevalence of health behaviours through a conventional letter grading system (ranging from A+ to F).[16] This framework has been used to evaluate various health-related behaviours (eg, physical activity,[17-19] sedentary behaviour,[17-19] smoking behaviour,[20] and dietary patterns[20-22]) in children and youth. The findings of such report cards offer insights concerning the extent to which health behaviours are adopted in specific communities and provide targeted recommendations for health behaviours at the individual or public level.[16,23] Moreover, the publication of these report cards can facilitate health promotion awareness and catalyse policy changes that motivate individuals to commit to health behaviours.[16,19,24] Thus far, only one published report card (the Healthy Active Kids South Africa [HAKSA] Report Card) has revealed dietary patterns among children and youth.[21] However, the HAKSA Report Card only covered the intake of fruits, vegetables, and unhealthy snacks; other essential aspects of healthy eating (eg, daily breakfast consumption, dietary variety, mealtime behaviours, and FHFEs) were not considered. Additionally, because the evidence underlying the grading criteria for various aspects of healthy eating was not explicitly stated, the findings of the HAKSA Report Card might not provide useful benchmarks concerning how well individuals adhere to healthy eating standards or recommendations adopted by health authorities. Therefore, we aimed to address the aforementioned research gaps through a cross-sectional study that developed the Healthy Eating Report Card for Pre-school Children in Hong Kong, using a grading scale and evidence-based benchmarks to assess the current prevalence of healthy eating behaviours and favourable FHFEs among pre-school children in Hong Kong.

Our Report Card assesses various indicators of Children's Eating Behaviours (ie, Children's Dietary Patterns and Children's Mealtime Behaviours) and FHFEs (ie, Parental Food Choices and Preparation, Avoidance of Unhealthy Foods, and Family Mealtime Environments). Each indicator and its specific items are assigned letter grades based on predefined benchmarks, revealing how well pre-school children in Hong Kong meet the recommendations and standards established by the government and published literature concerning pre-school children's healthy eating behaviours and FHFEs (Tables 1[25-31] and 2[23]). The findings may enhance the understanding of eating behaviours and FHFEs among pre-school children in Hong Kong. Additionally, the Healthy Eating Report Card established in our study will be useful for future studies examining healthy eating among young children in other countries or regions.

TABLE 1. Indicators and benchmarks in the Healthy Eating Report Card for Pre-school Children in Hong Kong

	Benchmark
Children's Eating Behaviours Indicators	
(1) Children's Dietary Patterns	% of children who eat three regular meals (breakfast, lunch, and dinner) daily[25] % of children who do not have a formula milk-drinking habit[26] % of children who eat a variety of foods from each of the five main food groups* daily[25,27] % of children who have adequate vegetable intake (at least two servings) daily[26] % of children who have adequate fruit intake (at least two servings) daily[26] % of children who consume unhealthy (high in fat, sodium, and sugar) snacks fewer than 3 times per week[25,28] % of children who drink sugar-sweetened beverages fewer than 3 times per week[25,28]
(2) Children's Mealtime Behaviours	% of children who do not require parental feeding assistance to finish most meals (≥90%)[25,29] % of children who remain seated at the table for most of the meal (≥90%)[29] % of children who are not picky eaters[29] % of children who are willing to try new food[29] % of children who are not slow eaters[29]
Family Home Food Environment Indicators	
(3) Parental Food Choices and Preparation	% of parents who use food labels to choose pre-packaged food for their children[26] % of parents who consider low-fat/-sodium/-sugar options when choosing food for their children[30] % of parents who prepare food using low-fat cooking methods (ie, pan-frying and deep-frying cooking methods are excluded)[30] % of parents who reduce the use of sugar or sodium-containing seasonings (eg, dark soy sauce, oyster sauce, and ketchup) during cooking[30]
(4) Avoidance of Unhealthy Foods	% of parents who limit the frequency and quantity of unhealthy (high in fat, sodium, and sugar) snacks their children eat[25] % of parents who do not give unhealthy snacks to reward or comfort their children[25]
(5) Family Mealtime Environments	% of parents who do not allow their children to use screen devices during mealtimes[31] % of children who dine with their parents or family members[25] % of children who eat the same food as other family members at meals[29]

* Include grains; fruits; vegetables; meat, fish, eggs, and alternatives; and milk and alternatives[26]

Methods

Participants

We recruited 538 Hong Kong parent-child dyads from eight local kindergartens in three main regions of Hong Kong (29.55% of children from the New Territories, 62.64% of children from Kowloon, and 7.81% of children from Hong Kong Island). The children were aged between 2 and 6 years with a mean age of 4.10 years (standard deviation=0.92); 49.63% of the children were boys. Of the children, 33.77%, 29.46%, and 36.77% were in grades K1, K2, and K3, respectively. Respondents were mainly mothers (85.63%), followed by fathers (13.25%) and other legal guardians (1.12%). The mean respondent age was 36.62 years (standard deviation=5.84).

Procedures

This cross-sectional study examined the prevalence of healthy eating behaviours and favourable FHFEs among Hong Kong pre-school children in October 2021. We sent invitation letters to 89 randomly selected local kindergartens across 18 districts in Hong Kong (excluding international schools and special needs schools). Eight kindergartens agreed to participate in this study and distribute our questionnaire to eligible parents. The inclusion criteria required participants to: (1) be Chinese parents or guardians; (2) have at least one child in grades K1 to K3; and (3) have sufficient Chinese reading ability to complete the questionnaire. Schools and parents were both asked to provide written informed consent. Parents completed a parent-reported questionnaire (comprising the Healthy Eating Report Card items) about their children's eating behaviours and FHFEs, which typically required 15 minutes to complete. Respondents received a HK$50 supermarket voucher as a token of appreciation for their participation.

Report Card questionnaire

The design of our Healthy Eating Report Card was based on the conceptual framework established by the Report Card on Physical Activity for Children and Youth, which offers a comprehensive grading framework and benchmarks to evaluate health behaviours.[16-23] The Global Matrix 3.0 Physical Activity Report Card for Children and Youth has been used in 49 countries to evaluate the prevalence of physical activity behaviours among children and youth.[23] Using a similar assessment framework, our Healthy Eating Report Card evaluated the prevalence of healthy eating behaviours and favourable FHFEs among Hong Kong pre-school children. The Healthy Eating Report Card Questionnaire consisted of 21 items which were developed based on the

healthy eating guidelines and recommendations of the Department of Health of Hong Kong.[25,26] The items were aligned with the five indicators of our Report Card, including two Children's Eating Behaviours indicators (ie, Children's Dietary Patterns and Children's Mealtime Behaviours) and three FHFEs indicators (ie, Parental Food Choices and Preparation, Avoidance of Unhealthy Foods, and Family Mealtime Environments), to determine whether the children adhered to healthy eating behaviours and were involved in healthy FHFEs. Participants responded to questionnaire items using a 5-point Likert scale (ranging from 'always' to 'never'), yes/no questions, open-ended questions, and multiple-choice questions. The questionnaire is provided in online supplementary Appendix 1.

Data analysis

Benchmarks for each indicator were established in accordance with recommendations and guidelines for healthy eating behaviours and FHFEs from the Hong Kong SAR Government and published literature.[25-31] Based on the results of the questionnaire, we used a benchmark framework to determine the letter grade for each indicator that reflected the percentage of participants who met the predetermined benchmarks. A sub-grade was also determined for each indicator item. The questionnaire items and criteria of questionnaire answers related to the benchmarks are displayed in online supplementary Appendix 2.[25,26,28-31] The grading system for the Healthy Eating Report Card was derived from the grading rubric of the Global Matrix 3.0 Physical Activity Report Card for Children and Youth, ie, A (≥80%, Excellent); B (60%-79%, Good); C (40%-59%, Fair); D (20%-39%, Poor); and F (<20%, Very poor).[23] Plus (+) and minus (-) signs were used to show the upper or lower 5% of each grade.[23] The proposed benchmarks and the grading scheme are shown in Tables 1[25-31] and 2,[23] respectively.

Due to the percentage calculation, responses to 5-point Likert scale questions in the questionnaire were converted to binary variables; responses of 'sometimes', 'often' and 'always' were categorised as 'yes', whereas responses of 'never' and 'rarely' were categorised as 'no'.[32] All statistical analyses were performed using SPSS software (Windows version 26.0; IBM Corp, Armonk [NY], United States). Missing values ranged from 0.19% to 2.79% for questionnaire items because of nonresponses to some items. The descriptive statistics revealed valid percentages for each indicator item, along with 95% confidence intervals (CIs). The arithmetic mean for each indicator was calculated by summing the valid percentage for each item of the indicator, then dividing that value by the number of corresponding items. This arithmetic mean represents the average percentage of participants who met predefined benchmarks for that indicator.

Results

The letter grades of our Healthy Eating Report Card are summarised in Table 3. The descriptive statistics of the Report Card are displayed in online supplementary Appendix 3. The average grades of Children's Eating Behaviours indicators and FHFEs indicators were 'C' and 'B', respectively, showing that the eating behaviours of Hong Kong pre-school children were classified as Fair, whereas FHFEs were

TABLE 2. Grading system of the Healthy Eating Report Card for Pre-school Children in Hong Kong*

Grade	Percentage and grade explanation	Description
A+	94%-100%	
A	Most children/parents meet the predefined benchmark (87%-93%)	Excellent
A-	80%-86%	
B+	74%-79%	
B	More than half of children/parents meet the predefined benchmark (67%-73%)	Good
B-	60%-66%	
C+	54%-59%	
C	Approximately half of children/parents meet the predefined benchmark (47%-53%)	Fair
C-	40%-46%	
D+	34%-39%	
D	Fewer than half of children/parents meet the predefined benchmark (27%-33%)	Poor
D-	20%-26%	
F	Very few children/parents meet the predefined benchmark (<20%)	Very poor

* Derived from the grading rubric of the Global Matrix 3.0 Physical Activity Report Card for Children and Youth[23]

classified as Good (Table 3). On average, nearly half of the pre-school children (52.88%; 95% CI=51.26%-54.50%) adhered to healthy eating behaviours, whereas more than half of the parents (70.87%; 95% CI=69.34%-72.40%) provided their children with favourable FHFEs.

Children's Dietary Patterns

Nearly all children (97.58%) had three regular meals daily. However, only 24.34% of the children ate a variety of foods. Approximately half of the children had adequate vegetable and fruit intakes (50.84% and 58.40%, respectively). Moreover, 55.76% did not have a formula milk-drinking habit. Additionally, around half of the children had low consumption of unhealthy snacks and sugary beverages (52.25% and 58.87%, respectively) [online supplementary Appendix 3]. Overall, Children's Dietary Patterns was graded 'C+' (Fair), signifying that approximately half of the children (55.37%; 95% CI=53.98%-56.75%) adhered to healthy dietary patterns.

Children's Mealtime Behaviours

Fewer than half of the children (43.02%) did not require parental assistance to finish a meal. Only 38.32% of the children could remain seated during mealtimes. Of the children, 49.15% and 67.98% did not exhibit picky eating behaviours and were willing to try new foods, respectively. Nearly half of the children (49.35%) did not exhibit slow-eating behaviours (online supplementary Appendix 3). Children's Mealtime Behaviours was graded 'C' (Fair), showing that approximately half of the children (49.92%; 95% CI=46.28%-55.07%) exhibited desirable mealtime behaviours.

Parental Food Choices and Preparation

More than half of the parents (63.69%) used nutrition labels. Similarly, more than half of the parents (70.26%) considered low oil/salt/sugar food options for their children. Approximately half of the parents used low-fat cooking methods and reduced the use of sugar- or salt-containing condiments (53.53% and 43.58%, respectively) [online supplementary Appendix 3]. Parental Food Choices and Preparation was graded 'C+' (Fair), revealing that approximately half of the parents (57.88%; 95% CI=55.49%-60.28%) made healthy food choices and prepared healthy meals for their children.

Avoidance of Unhealthy Foods

Half of the parents (52.04%) did not reward their children with unhealthy snacks or drinks. A large majority of the parents (90.15%) limited the frequency and quantity of unhealthy foods (online supplementary Appendix 3). Therefore, Avoidance of Unhealthy Foods was graded 'B' (Good), signifying that more than half of the parents (71.10%; 95% CI=68.66%-73.53%) controlled their children's access to unhealthy foods.

Family Mealtime Environments

A large majority of the children dined with their parents or family members and ate the same food as other family members (93.47% and 95.50%,

TABLE 3. Letter grades assigned to indicators and their items in the Healthy Eating Report Card for Pre-school Children in Hong Kong*

	Grade†	Description†
Overall Children's Eating Behaviours	**C**	**Fair**
Indicator 1: Children's Dietary Patterns	C+	Fair
Three regular meals per day	A+	Excellent
Not having a formula milk-drinking habit	C+	Fair
Variety of foods from each of the five main food groups	D-	Poor
Adequate vegetable intake daily	C	Fair
Adequate fruit intake daily	C+	Fair
Low consumption of unhealthy snacks	C	Fair
Low consumption of sugar-sweetened beverages	C+	Fair
Indicator 2: Children's Mealtime Behaviours	C	Fair
Self-feeding independence during mealtime	C-	Fair
Remaining seated at the table during mealtime	D+	Poor
Not picky eaters	C	Fair
Willingness to try new food	B	Good
Reasonable eating speed	C	Fair
Overall Family Home Food Environment	**B**	**Good**
Indicator 3: Parental Food Choices and Preparation	C+	Fair
Parental use of food labels to choose pre-packaged food	B-	Good
Parental consideration of low-fat/-sodium/-sugar options when choosing food	B	Good
Parental preparation of food using low-fat cooking methods	C+	Fair
Parental reduction of the use of sugar or sodium-containing seasonings	C-	Fair
Indicator 4: Avoidance of Unhealthy Foods	B	Good
Parental restriction of unhealthy snacking among children	A	Excellent
Parental avoidance of unhealthy snacks as a reward	C	Fair
Indicator 5: Family Mealtime Environments	A-	Excellent
Parental prevention of screen device use during mealtimes	B-	Good
Dining with parents or family members	A	Excellent
Eating the same food as other family members at meals	A+	Excellent

* The letter grades for each indicator were based on the average percentage of children who met predefined benchmarks for that indicator, and the overall grades were the average of the indicator grades

† Refer to Table 2

respectively). More than half of the parents (61.08%) did not allow their children to use screen devices during mealtimes (online supplementary Appendix 3). Family Mealtime Environments was graded 'A-' (Excellent), showing that most children (83.46%; 95% CI=81.63%-85.29%) were involved in structured family mealtime environments.

Discussion

This study aimed to develop the Healthy Eating Report Card for Pre-school Children in Hong Kong, which assessed the prevalence of healthy eating behaviours and favourable FHFEs among pre-school children in Hong Kong. We established evidence-based benchmarks to guide the process of grading Children's Eating Behaviours indicators and FHFEs indicators, then utilised letter grades to illustrate how well children adhered to healthy eating behaviours. Children's Dietary Patterns and Children's Mealtime Behaviours were graded 'C+' and 'C', respectively, signifying that eating behaviours in Hong Kong pre-school children were Fair; the average overall grade was 'C'. Our findings indicate that approximately half of the pre-school children in Hong Kong adhered to healthy eating behaviours. Parental Food Choices and Preparation, Avoidance of Unhealthy Foods, and Family Mealtime Environments were graded 'C+', 'B', and 'A-', respectively, showing that FHFEs were Good; the average overall grade was 'B'. Our results revealed that more than half of the pre-school children in Hong Kong were involved in a healthy home eating environment. Taken together, these findings enhance the understanding of pre-school children's eating behaviours and FHFEs in Hong Kong.

Comparison of Report Card findings with Hong Kong's previous data

Our Report Card showed that the eating behaviours of Hong Kong pre-school children were classified as Fair; some unhealthy dietary patterns and undesirable mealtime behaviours were prevalent because nearly half of the children did not meet predefined benchmarks for Children's Eating Behaviours indicators. Previous research[33] concerning the eating habits of Hong Kong pre-school children showed that more than half of the surveyed children (78.8%) had a habit of eating breakfast. Nevertheless, fewer than half of the children achieved the recommended daily intakes of vegetables (19.6%) and fruits (47.3%), respectively.[33] Some studies identified a high prevalence of formula milk drinking among Hong Kong pre-school–aged children, such that 77% of 4-year-old children continue to drink formula milk.[5,34] Overdependence on formula milk may reduce appetite in children and impede their development of healthy eating habits.[35] Lo et al[33] found that, on average, children consumed high energy-dense foods (eg, candy/chocolate, sweet crackers, and sugary beverages) more than twice per week; accordingly they suggested that such children should minimise their consumption of these foods. Additionally, an investigation regarding undesirable mealtime behaviours among Hong Kong pre-school children revealed that approximately 70% of the children required >30 minutes to finish a meal; these children often were unwilling to self-feed or finish their meals.[6] The present study are consistent with previous research, indicating that there is considerable potential for improvement in eating behaviours among Hong Kong children.

Comparison of Report Card findings with international data

As mentioned above, the HAKSA Report Card assessed a few aspects of the dietary patterns of South African children and youth aged 3 to 8 years in 2018. Although using a grading rubric similar to our Report Card, the HAKSA Report Card only involved two indicators, namely Fruit and Vegetable Intake (graded 'D') and Snacking, Sugar-Sweetened Beverages, Dietary Sodium, and Fast Food Intake (graded 'F').[21] Our Report Card may provide better coverage of healthy dietary patterns because it included assessments of regular daily meals, food variety, and formula milk-drinking habits, with a particular focus on pre-school children aged 2 to 6 years. Despite the discrepancies between studies, the healthy dietary patterns observed in our Report Card were more favourable than patterns observed in the HAKSA Report Card.[21] This difference also implies that standards for healthy eating behaviours among children differ between South Africa and Hong Kong. Future studies should develop a cross-country/region–level Report Card and establish a global benchmark to comprehensively analyse global variations in healthy eating, thereby raising global awareness and stimulating global discussion regarding the promotion of healthy eating.

Novel findings on family home food environments

Very little is known about FHFEs of children in Hong Kong; therefore, the present study provides initial information concerning parental food choices and preparation, avoidance of unhealthy foods, and family mealtime environments among Hong Kong pre-school children. Based on our findings, the FHFEs of the pre-school children in Hong Kong were classified as Good. This result suggests that parents in Hong Kong attempt to promote healthy diets by limiting their children's consumption of unhealthy foods. A previous study revealed that Hong Kong parents tended to adopt the 'control over eating'

approach to feed their children, whereby parents primarily determine the amounts of food that children should eat, including unhealthy snacks.[33] Moreover, parents often used food to reward or comfort children.[36] The indicator of Family Mealtime Environments in our Report Card showed that most pre-school children had a structured family mealtime environment where they dined with their family and shared the same food with their family members. This finding may be attributed to the Chinese cultural emphasis on shared meals with family members.[37] Thus, the results of the present study are consistent with previous research findings.

However, this high grade for Family Mealtime Environments may have increased the average grade for FHFEs indicators. Indeed, parents' food choices, purchases, and preparation directly influence children's home food environment and food consumption.[38] When we specifically focused on the Parental Food Choices and Preparation indicator, the grade decreased to Fair (letter grade of 'C+'), signifying that only half of the parents complied with healthy eating practices for their children, such as the use of nutrition labels and adoption of healthy cooking methods. Thus, it is important to promote healthy eating at home, which will facilitate healthy eating behaviours among children. A pilot FHFE intervention of the Healthy Home Offerings via the Mealtime Environment Plus programme, which provided parents and children with nutrition education and meal preparation training and activities, successfully promoted a structured mealtime environment at home and helped to improve dietary intake patterns.[39,40] Accordingly, future studies might utilise nutrition education interventions to improve the FHFEs of pre-school children in Hong Kong.

Strengths and limitations

This study had some strengths. In particular, we collected primary data to enhance the understanding of eating behaviours and FHFEs among pre-school children in Hong Kong. Moreover, to our knowledge, this is the first use of a report card framework to comprehensively evaluate the prevalence of healthy eating behaviours among pre-school children.[41] The Report Card can serve as an effective awareness-raising tool that provides novel insights concerning the promotion of healthy eating behaviours, as well as recommendations for healthy eating policies and healthy food environments.[23]

However, this study also had several limitations. First, its cross-sectional design precluded the identification of changes in children's eating behaviours and FHFEs over time. Future studies could perform longitudinal measurements of variables in the Report Card to reveal changes or stability in healthy eating behaviours among young children; such measurements could also determine whether Report Card scores are predictive of health outcomes in children. An individual-level Healthy Eating Report Card should be developed in future studies to examine the effectiveness of the Report Card on parental intentions towards healthy eating, as well as children's healthy eating behaviours and favourable FHFEs. Second, although the items of the Healthy Eating Report Card Questionnaire were developed based on the guidelines and recommendations of the Hong Kong SAR Government,[25,26] the development of the questionnaire did not include evaluations of its content validity and psychometric properties. Future studies should examine the psychometric properties and other validity aspects of the Report Card questionnaire (eg, factorial validity, convergent validity, and discriminant validity).[42] Third, the study relied on parent-reported questionnaires of children's eating behaviours and FHFEs, which may be susceptible to response biases, social desirability bias, and general response tendencies.[43,44] Validation studies comparing parent-reported questionnaires with more objective measures of children's food intake and observational assessments of mealtime behaviours could be conducted in the future. Finally, the current Report Card does not reflect several components of children's eating behaviours (eg, the frequency of dining out and the variety of vegetable and fruit consumption) and FHFEs (eg, parental feeding practices and accessibility of healthy food at home). Future studies should investigate whether these components could be included within the Healthy Eating Report Card to provide a more holistic assessment of healthy eating among children.

Conclusion

This study developed the Healthy Eating Report Card for Pre-school Children in Hong Kong to reflect the prevalence of healthy eating behaviours and favourable FHFEs among pre-school children in Hong Kong. The Report Card revealed that Children's Eating Behaviours were classified as Fair (average grade of 'C'), whereas FHFEs were classified as Good (average grade of 'B'). There is considerable potential for improvement in children's eating behaviours (ie, healthy dietary patterns and appropriate mealtime behaviours) and FHFEs (particularly concerning parental healthy food choices and preparation). We believe that the Report Card can serve as a useful tool for evaluating the prevalence of healthy eating behaviours and favourable FHFEs in young children; it could offer novel insights into strategies for promotion of healthy eating in pre-school setting.

Author contributions

Concept or design: All authors.
Acquisition of data: AWL Wan, DKC Chan.
Analysis or interpretation of data: AWL Wan, DKC Chan.

Drafting of the manuscript: AWL Wan, DKC Chan.
Critical revision of the manuscript for important intellectual content: All authors.

All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

All authors have disclosed no conflicts of interest.

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Ethics approval

The study protocol of this research was approved by the Human Research Ethics Committee of The Education University of Hong Kong (Ref No.: 2020-2021-0420). All schools and parents provided written informed consent for participation in this research and have also consented to the publication of its findings.

Supplementary material

The supplementary material was provided by the authors and may include some information that was not peer reviewed. Accepted supplementary material will be published as submitted by the authors, without any editing or formatting. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by the Hong Kong Academy of Medicine and the Hong Kong Medical Association. The Hong Kong Academy of Medicine and the Hong Kong Medical Association disclaim all liability and responsibility arising from any reliance placed on the content. To view the file, please visit the journal online (https://doi.org/10.12809/hkmj2210649).

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