Cross-Sectional Exploration on Feeding Practices of Feeders towards Preschoolers' Picky Eating Behaviors

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Abstract

Background: Picky eating is quite common among preschoolers, which may lead to imbalanced diet. Picky eating behavior among preschoolers was found associated with feeding style. With the complex family structure of 2-career parents in Hong Kong and unique authoritarian Chinese feeding style, this study aimed to explore the differences in feeding practices among different preschoolers’ feeding persons and to investigate if preschoolers’ picky eating showed differences if they are fed by different feeding persons.

Methods: A cross-sectional survey was conducted in five Hong Kong kindergartens. Feeding persons of the preschoolers were asked to complete questionnaires with responses in different feeding styles and 2-day dietary records of the preschoolers. The dietary review was conducted to evaluate if the preschoolers were picky eaters if they missed any one of the five food groups or they did not consume sufficient amount of any food groups at their age. Descriptive statistics and chi-squared tests were analyzed to explore the chance of picky eating occurrence regarding the types of feeding persons and the feeding practices.

Results: 240 preschoolers aged 2 to 7 were recruited. 57.5% preschoolers were found picky eating. There was no significant difference in preschoolers’ picky eating behaviors among different types of feeding person. Significantly more picky eaters were found fed by carers with lower education levels.

Conclusion: Preschoolers fed by feeders with lower education may have limited skill and knowledge in food choices that preschoolers may have higher chance in developing picky eating problems.

Keywords: Picky eating, Feeding practice, Preschoolers, Feeding persons, Cross-sectional study

Introduction

Picky eating is a common feeding problem among preschoolers which may lead to poor diet and result on poor growth and development. Picky eating has a wide definition in literature. Some studies found that parents described their children ‘picky’ when the children consuming a limited quantity of food [1]. Picky in some extent could be referred to food neophobia when the children were unwilling to try unfamiliar food [2]. When the children are found to refuse the intake of some food groups [3], especially vegetables, picky eating, selective eating or choosy eating were frequently described in these eating problems. Picky eating sometimes is used when the children are described as having strong food preferences [4-5]. Literature found that the prevalence of picky eating among preschoolers varied from 8% to 54% in different population [1,2,6,7]. According to a local survey conducted in Hong Kong with 7,057 kindergartners aged 2 to 7, more than 40% of parents indicated that their children had picky eating [8]. About 56% of preschoolers consumed less than one serving of fruits each day and approximately 66% of them had less than a bowl of cooked vegetables each day [8]. It was found that only 12% of preschoolers consumed enough daily amounts of vegetables and fruits [8].

There are many factors causing picky eating among preschoolers and parents’ influential role is a crucial point. Some studies revealed that parental perception of children’s weight status, attitude on how to feed their children, family dietary style and caring pressure would affect preschoolers’ picky eating behavior [9,10]. Preschoolers’ food preference was found associated with their parents’ food choices and feeding practices that could lead to less variety of food intake [11,12]. It was found that mother’s eating habits and whether the mother viewed her children as a ‘picky eater’ had a great influence on the children’s actual consumption of vegetables and fruits [13]. It was evident that preschoolers’ picky eating behavior was aggravated when their parents used unhealthy snacks, like sweets, chocolates and chips, as rewards to encourage parents’ desired good behavior [14,15]. In addition, high controlling practices, such as pressure to eat and food restriction, could have adverse effect on the preschoolers’ picky eating behavior [16]. Preschoolers were less likely to consume unfamiliar food when their parents forced them to try under pressure [17]. Theory of classical conditioning determines children have bad experience in feeding unfamiliar food; they are prone to refuse that food. In some cases, children were found less likely to be picky-eating and consumed more vegetables and fruits if their mothers consumed more vegetables and fruits [18]. Therefore, parental feeding styles were heavily studied to play a crucial role in children’s eating behavior [19].

Chinese parenting style has been described as authoritarian that...
the parents used to exert controlling power over their children. This
type of parenting style involved varieties of daily concern, caring and
feeding would be one of them [20]. In Hong Kong, 45.3% of families
were the type of 2-career family. Most of preschoolers’ feeding person
was their grandparents or domestic helpers, instead of their parent
who needed to work for a long period of time every day. Survey
resulted that 10.6% of preschoolers are fed by domestic helpers and
5.9% of them were fed by grandparents [15]. Since many studies focus
on the relationship between maternal feeding and children’s picky
eating, there are a limited number of studies investigating the roles
of feeders and their feeding practice in preschoolers’ picky eating
problems. However, the complex family structure in preschoolers’
caring responsibility and the unique parenting style in Hong Kong
may affect the eating behavior, particularly picky eating among
preschoolers. Therefore, this study aimed to explore the feeding
practices among different feeders and to investigate if any significant
differences in the occurrence of picky eating among preschoolers’
with different feeders.

Methodology

Design

This was a cross-sectional study using a self-administered
questionnaire and a 2-days food diary completed by the feeding
persons of the preschoolers.

Settings

The dietary records and feeding practice questionnaires
were distributed and collected in five governments-subsidized
kindergartens in Hong Kong.

Samples and Samplings

Preschoolers and their parents were recruited by convenience
in five kindergartens in Hong Kong. Inclusion criteria were: the
preschoolers aged 3 to 6 years and studying in kindergarten 1 to 3
were invited. In recent years, it has been common for children living in
Mainland China to come study in Hong Kong. Taking consideration of
the varied eating cultures and food choices, the preschoolers recruited
must be a permanent resident living in Hong Kong. Exclusion criteria:
the preschoolers of cross-boundary students were excluded to avoid
different feeding practice affected by other cultures. Teachers in the
kindergartens helped to distribute information sheets to the parents
of the preschoolers.

Instrument

A questionnaire consisted of 3 parts and it was designed to collect
demographic data and feeding practices of the feeders. First part
included 12 questions about the demographic data of preschoolers
and their feeders. Second part included 3 questions about feeding
practices of feeding person. And the last part was a set of 2-day dietary
record to assess the eating habits of preschoolers. Feeders were asked
to record all the details of food items, corresponding portion size and
condiments added to the food. The feeders were asked to record each
food consumed by, not cooked for the preschoolers in 2 consecutive
full days.

Procedure

This study was approved by the ethics review committee of the
Hong Kong Institute of Education. After getting the ethical approval,
information letters were distributed to eligible preschoolers and their
parents, explaining the objective, procedures, method of the study.
After returning the consent forms, each participant received the
questionnaire with demographic data and a set of 2-day dietary record
form from the kindergartens in January 2014. The demographic data
could be completed by the parents or feeding person. The 2-day
dietary record should be completed by the feeding person on the
consecutive Saturday and Sunday because the children normally had most
of their meals at schools during weekdays. The feeding person needed
to list out the food prepared for their preschooler in meals and record
the amount that the preschooler had. If participants had any queries,
the kindergartners could answer their questions. After finishing the
questionnaires, preschoolers should return it to the kindergartners.
Teachers of the kindergartens also helped to measure the body height
and body weight of the preschoolers. Body height was measured in a
standing scale and the unit was in centimeters (cm). Body weight was
measured in a standing balance and the unit was in kilograms (kg).

Data analysis

For the dietary records, two independent researchers evaluated
the records according to the Dietary Guidelines [21]. According to
the Dietary Guidelines, children should consume all the food groups
of carbohydrates, fruits, vegetables, protein and dairy products.
Therefore, these five food groups were used as criteria to assess the
2 days dietary records. If there was any missing food group or
the amount of consumption was found not sufficient for the age of
preschoolers in the 2 days dietary records, the preschoolers would be
classified as picky eaters. If all the five food groups were found and the
amount of consumption was found sufficient for the age of
preschoolers in the 2 days dietary records, the preschoolers would be
classified as non-picky eaters. The results of the dietary review from
the two independent researchers were compared to ensure results
were in consistent.

All data collected were coded and analyzed using IBM SPSS version
21. Descriptive statistics were used to analyze the demographic data,
such as age, height, and weight. Chi-square tests used to explore if the
types of feeders (parents, grandparents and maids), their education
level and their feeding practices showed significant differences in the
occurrence of picky eating preschoolers.

Results

In total, 240 questionnaires were collected from the parents of
the recruited preschoolers. Among the preschoolers, 55.4% were
male (n = 133) and 44.6% were female (n = 107) (Table 1). Only 1.3%
parents (n = 3) had food avoidance due to religion. Only 0.8%
preschoolers (n = 2) were vegetarians. The participants who had food
avoidance due to religion and vegetarian diet were excluded in data
analysis because their eating habits were affected by factors other than
feeding practices. The mean age of male and female was 4.1 and 4.0
respectively (p > 0.05). The mean height of male was 104.3 cm with
standard deviation of 10.25cm and the mean height of female was
101.3 cm and the standard deviation of 11.38 cm. The mean weight
of male was 18.1 kg with standard deviation of 4.20 kg while the mean
weight of female was 17.2 kg and the standard deviation was 4.45 kg.

Characteristics of feeding persons

In the questionnaire, there were 3 types of feeding person found:
Parents, Grandparents, Maid/Others. Responses reported 146 parents
(60.8%), 52 grandparents (21.7%) and 42 maids/others (17.5%)
were the key responsible feeding persons of the preschoolers (Table
2). Among the feeding persons, most of them obtained secondary
education (63.3%) and around one-fifth (22.1%) obtained tertiary
education. Fewer than half of the feeding persons were born in
Hong Kong and 14.2% of the responded feeding persons perceived
themselves picky eaters (Table 2).

Responses found that around one third (36.7%) of the feeding
persons do nothing in regards to children's picky eating problems.
There were one-fourth (25.4%) of them try to replace another foods

<p>| Table 1: Demographic characteristics of preschoolers. |
|------------------------------------------|------------------------------------------|</p>
<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>133 (55.4)</td>
<td>107 (44.6)</td>
</tr>
<tr>
<td>Age (year)</td>
<td>Mean (S.D.)</td>
</tr>
<tr>
<td>4.1 (1.11)</td>
<td>4.0 (1.10)</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>104.3 (10.25)</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>18.07 (4.20)</td>
</tr>
</tbody>
</table>
Table 2: Characteristics of the feeding persons of preschoolers.

<table>
<thead>
<tr>
<th>Types of feeding persons</th>
<th>n (%)</th>
<th>Parents</th>
<th>Grandparents</th>
<th>Maids/ others</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>146 (60.8)</td>
<td>52 (21.7)</td>
<td>42 (17.5)</td>
<td></td>
</tr>
<tr>
<td>Highest education obtained</td>
<td>n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary education</td>
<td>35 (14.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary education</td>
<td>152 (63.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tertiary education</td>
<td>53 (22.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Self-perceived picky eaters</th>
<th>n (%)</th>
<th>Parents</th>
<th>Grandparents</th>
<th>Maids/ others</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>34 (14.2)</td>
<td>206 (85.8)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Food avoidance due to religions</th>
<th>n (%)</th>
<th>Parents</th>
<th>Grandparents</th>
<th>Maids/ others</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15 (6.3)</td>
<td>225 (93.8)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Born in Hong Kong</th>
<th>n (%)</th>
<th>Parents</th>
<th>Grandparents</th>
<th>Maids/ others</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>106 (44.2)</td>
<td>134 (55.8)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Feeding practices on preschoolers’ picky eating problems.

<table>
<thead>
<tr>
<th>Feeding practices</th>
<th>n (%)</th>
<th>Parents</th>
<th>Grandparents</th>
<th>Maids/ others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do nothing</td>
<td>88 (38.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace another foods to the preschoolers</td>
<td>61 (25.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Give preschooler’s favorite food as incentives</td>
<td>41 (17.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allow preschooler watching TV during meals</td>
<td>17 (7.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Punishment</td>
<td>19 (7.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Force to preshoolers to eat</td>
<td>14 (5.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Results of Chi-squared tests.

<table>
<thead>
<tr>
<th>Picky eaters (assessed by dietary records)</th>
<th>p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Preschoolers’ sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>71 (29.6)</td>
</tr>
<tr>
<td>Female</td>
<td>67 (27.9)</td>
</tr>
<tr>
<td>Feeding persons</td>
<td></td>
</tr>
<tr>
<td>Parents</td>
<td>79 (32.9)</td>
</tr>
<tr>
<td>Grandparents</td>
<td>32 (13.3)</td>
</tr>
<tr>
<td>Maids/Others</td>
<td>27 (11.3)</td>
</tr>
<tr>
<td>Feeding person’s education level</td>
<td></td>
</tr>
<tr>
<td>Primary education</td>
<td>22 (9.2)</td>
</tr>
<tr>
<td>Secondary education</td>
<td>94 (39.2)</td>
</tr>
<tr>
<td>Tertiary education</td>
<td>22 (9.2)</td>
</tr>
<tr>
<td>Feeding practices to picky eating</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>68 (28.3)</td>
</tr>
<tr>
<td>Neutral</td>
<td>40 (16.7)</td>
</tr>
<tr>
<td>Negative</td>
<td>30 (12.5)</td>
</tr>
<tr>
<td>Allow preschoolers watching TV during meals</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>77 (31.3)</td>
</tr>
<tr>
<td>No</td>
<td>61 (48.3)</td>
</tr>
</tbody>
</table>

Discussion

In this study, the prevalence of picky eater in preschoolers was 57.5%, which was deemed higher than the reported prevalence (up to 50%) in other countries [3,5,6]. This higher prevalence might be caused by the lack of agreement on the definition in studies and different cultural acceptance of picky eating worldwide [22].

In the current study, it was significant that preschoolers’ picky eating problems were shown significantly different with feeding persons’ educational level. Picky eating was of higher chance to be occurred in the group of preschoolers who were fed by feeding persons with secondary and primary education. This could be because the feeding persons with tertiary education had better concepts in healthy eating and they may pay more attention in food choices to make sure their children obtain sufficient nutrition for growth and development. For those feeding persons having primary education and secondary education, they may have sufficient knowledge and skills in choosing nourished diet for their children, particularly to those preschoolers who were cared by maids or nannies. Studies indicated lower education level was associated with food quality and this resulted less knowledge in healthy food choices [23]. Misconceptions of preschoolers’ nutrition requirements and improper snacks categorization [24-27] were also found possible reasons in poor food choices for the children. A local survey revealed that 73% to 88% students had foods high in sugar, salt, and fats, but 71% of parents believed their son/daughters’ eating habits were “healthy” [15]. Also the prevalence of preschoolers’ picky eating was found higher if the preschoolers were fed by grandparents or maids/nannies. Grandparents prone to spoil their grandchildren while maids or nannies may not pay too much attention on children’s eating behavior because they were not the decision makers in food purchasing and they showed little control in preschoolers’ healthy diet.

Nevertheless, results in this study showed higher chance of...
picky eating among preschoolers who used to watch TV during meal time. This postulated the prolonged eating time would probably affect the taste of the food which made the preschoolers less interest to eat the provided food. This would be worth to be explored in future studies.

Limitation

The convenience sampling could lead to sampling bias. The proportions of different types of feeding persons were not evenly distributed. The recruited number of maids was much less than parents and this could be due to the demographic characteristics of the recruited population. Recruited families were mainly from low household-income family, which might not have financial abilities to afford employing maids to take care of the children. However, maids were usually the key caretakers among those families with higher household income.

Conclusion

Preschoolers fed by feeders with lower education may have limited skill and knowledge in food choices that preschoolers may have higher chance in developing picky eating problems.

References