Factors Influencing Snacking Practices of Preschoolers in Bangkok, Thailand: A Qualitative Study

Jomkwan Yothasamut (✉ Jomkwan.y@hitap.net)

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Research article

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Abstract

Background: The National Health Examination Survey 2014 revealed 11.3% of children aged 1-5 years in Thailand were overweight and obese. Few studies explored sociocultural factors that creates obesogenic environment. This study aims to understand the mechanisms of factors influencing childhood obesity.

Methods: A qualitative inductive approach was employed for data collection designed to capture the temporal and spatial specificity of snacking. Participant observation and informal interviews were data collection methods. Three kindergartens used by families of varying socio-economic status, and the homes of 18 pre-schoolers attending these kindergartens were settings of this study.

Results: Channels where children could obtain snacks included routine snacks at kindergarten, snacks that children can bring from home to eat and share with peers, and snacks that children can buy on the way to/from homes. Other factors influenced their consumption included the child's characters, family rituals, and snack money. Values influencing snacking practices were 'snacks as a treat or as reward' and 'snack is a treat, let the child make a choice'.

Conclusions: Social values were significant sociocultural factors promoting childhood obesity and study of sociocultural factors are as important as economic factors and are equally needed for understanding of childhood obesity problem. This type of study help supports the design of intervention to tackle the problem.

Background

Obesity in children aged 0-6 increased in Thailand by 40% between 2004 and 2009, with urban residence a significant risk factor (1, 2). The recent National Health Examination Survey conducted in 2014 revealed 11.3% of children aged 1-5 years in Thailand were overweight and obese. The survey also showed an increase in number of preschool children spending times (more than 2 hours per day) on television which reflect sedentary behaviours and affects an increase in consumption of high-calories and -sodium snacks advertising on televisions. In addition, the majority of children (more than 95% regardless of where they live, urban or rural areas) can access to convenience stores and grocery stores where they can get snacks (3) This study recognised unhealthy food as one of factors influencing development of childhood obesity and employed its definition from this literature: "energy dense food that are unhealthy because of nutrients". These include fast food, sweetened beverages, sweets and fatty snacks (4).

Considering influential factors affecting obesity, studies on obesogenic environment was identified a gap of studies in Thailand. The main foci of the literature on childhood obesity in Thailand include the prevalence and monitoring of obesity-causing behaviours such as the consumption of unhealthy snacks and sweets (1). Increasing attention has been paid to childhood obesity and substantial efforts have been made to tackle the problem in Thailand (5). These initiatives include educating teachers about proper nutritional intake for students by increasing the amount of fruit and vegetables in school meals, banning sweetened-carbonated drinks in schools, etc. No qualitative research approach has been used to

understand the factors that influence the development of obesity among pre-school-aged children, and in particular the sociocultural factors in the urban Thai context. This study therefore adds to the knowledge of influential factors using consumption of snacks as a case study and with a focus on pre-schoolers living in Bangkok Metropolitan, Thailand.

There have been attempts to understand the surrounding factors that could contribute to the development of obesity among pre-schoolers, besides their diet and physical activity. Scholars have been interested in environmental influences on individual's choices of food and physical activities and the development of obesity (6). Examples of factors that create an obesogenic environment include easy access to cheap energy-dense food, for example in deprived areas of developed countries and limited access to healthy food choices and facilities for physical activity (7, 8). Williams, Scarborough (9) conducted a systematic review of the effect of the food retail environment around schools on obesity-related outcomes among children. They suggest that rather than just focusing on retailers around educational facilities, future studies should take into account journeys taken by individual children to capture the entire environment that the child interacts with. Schmelzer and Krishnagiri (10) employed grounded theory approach to examine the health-promoting behaviours of middle-class families living in an obesogenic environment in Ohio, USA. Time management was presented as a limitation by both caregivers and children (i.e. parents busy with work and a lot of homework for children); further cultural aspects such as snacking and using food as a reward resulted in actions such as compromising or trading between healthy and unhealthy food/snacks in the preparation of food or snacks for children. The study recommends considering the physical and sociocultural environments of caregivers, which also affect the management of the children's food and snacking.

The concept of the obesogenic environment can provide an explanation of the environment surrounding individuals and affect their daily living conditions; however, there is a need to also understand the mechanisms of individuals' decisions and reactions (behaviours) within that environment. Such mechanisms may include the commercial advertisements to which people are exposed, and their lifestyles, including caregivers' working conditions, which shape their decision. The environment and individuals' interaction with it, is therefore highly context specific. This study therefore reviewed factors relevant to the construction of the obesogenic environment in that pre-schoolers of three kindergartens in Bangkok live in, focusing on the analysis of snacking practices.

Methods

Primary data were collected via observation over the course of a year, from October 2013–September 2014. The first publication has explained methodology and data collection methods in details (11). Pre-schoolers' snacking practices mainly took place in households, public places with caregivers and kindergartens. Both private and public kindergartens, which represented different snacking management policies were chosen. The households that used these kindergartens were of different socio-economic backgrounds, using the kindergartens' fees as a proxy of varying socio-economic status of households.

The children were recruited according to considerations of gender, socio-economic and size of family, e.g. nuclear and extended families. Details of sample recruitment described elsewhere (11).

A qualitative inductive approach was employed for data collection designed to capture the temporal and spatial specificity of snacking. Pre-schoolers and caregivers and their interactions around snacking were the focus. Participant observation was the main data collection method. Informal interviews were also used to gain deeper understanding and to triangulate data obtained from the observation and other sources.

Recruitment of participants

Three kindergartens used by families of varying socio-economic status (SES), and the homes of 18 pre-schoolers attending these kindergartens were settings of this study.

1) Three kindergartens, representing a formal care institution to which parents of different socio-economic status use. These comprise two privately-run kindergartens representing children from well-off and middle-class families and one state-run kindergartens representing children of lower socio-economic status.

2) The families of eighteen of the children across the three kindergartens. The families' socio-economic status was proxied by the selection of the kindergartens. The children were recruited based on characteristics such as gender and age stratification; they were all aged 3-5 years.

The three kindergartens were purposively selected with the permission of their directors and of the local authority in the case of state kindergarten. The fees for the kindergartens were used as the primary criteria to differentiate the children's SES. Selection of these three kindergartens of different socio-economic status aimed at exploring environment that children from different SES encountered. Informed consent to the observation at the participants' houses and other places where the families spent time together had to be obtained from the parents as well as the children. Four families dropped out once it came to the observation at home giving following reasons (a) their houses being too far from school and so not convenient; (b) their house not being clean and tidy enough; and (c) the parents being too busy and travelling all the time.

Data collection

The observations when the children are at homes or with their parents occurred on selected occasions. The observations were performed by JY[1] at least twice with each family, and the sessions lasted from 40 minutes to 4.5 hours. Open-ended questions developed for this study were used to understand actions, perceptions, knowledge and values concerning children's food and snacks consumption. Over a series of interactions and different activities, the questions involved snacks they had, and the places; occasions and the people present when they had snacks; and why they enjoyed particular snacks. This threw some

light on the influential factors behind their choices as well as their ability to negotiate with adults to achieve what the children wanted.

Data management and analysis

Field notes were kept throughout the course of the observations, recording the data daily as a chronological, non-interpretive description as suggested by McKechnie (12). The data were chronologically documented in the form of field notes and recorded interviews. The analysis was performed using the original materials, including the field notes, interview transcripts and policy documents. At the end of the data collection I translated the data from Thai to English and transferred the translated to and analysed by Nvivo software. The transcribed data were subjected to line-by-line data coding from which themes emerged. The data obtained from interviews as well as the interpretations was presented to the relevant interviewee for comments and corrections. The data focused on children's snacks consumption and its relevant factors and actors. The sub-themes that emerged from the data coding were grouped and synthesised and organised into main themes as illustrated in figure 1.

Ethical approval

This research study was approved by the International Development Research Ethics Committee, University of East Anglia and the Institute for the Development of Human Research Protections (IHRP) in Thailand in August 2013. Pseudonyms were assigned for three kindergartens and 18 children participated in this study.

Results And Discussion

The findings from this study provide insides and rationale of parents and children in relation to the provision and selection of snacks for pre-schoolers. Findings are divided into four sections; (1) pre-schoolers' snacking practices, (2) factors leading to the consumption of unhealthy snacks, (3) adults' perception and practices regarding their children's snacking, and (4) children's actions and perceptions regarding snacking.

1. Pre-schoolers' snacking practices

The Bureau of Nutrition's guidelines on food and snack preparation for pre-school children in Thailand recommended that pre-schoolers have three main meals and a few snack or light meal breaks, because children cannot eat a large amount of food at once (13). The guidelines also suggest that kindergartens prepare snacks for the children including fruit with lower sugar content such as guavas and papayas twice a week and traditional Thai snacks and other snacks three days a week. The kindergartens in this

study, complying with national and institutional policies, arranged snacking with milk breaks, in addition to the main meals. The selection of snacks for the formal snack and milk breaks was made by the kindergarten's catering staff which were in line with the national guidelines.

In addition to the snacks that were routinely prepared by the kindergartens, two kindergartens owned snacks stall where the children could also buy snacks from. Furthermore, children from these study kindergartens could bring snacks from home to eat and share with their peers. The options that parents prepared for their children varied, but were predominantly crisps and extruded corn snacks, the children's favourites. Few parents prepared fruit (peeled and cut oranges in small pieces) for their children. This showed varied channels where children could obtain snacks (of their choices), apart from the routine snacking organised by kindergartens.

Choices of snack foods depended on the children's preferences and the convenience of preparation for the parents. All the children in the observation ate unhealthy snacks such as crisps and extruded corn snack almost every day during their journey between home and kindergarten. The quantity of unhealthy snacks that the children consumed varied from half to two packets of crisps/extruded corn snack a day; a packet of this type contains approximately 190 kcal. This finding is supported by the National Health Examination and Survey in 2008-9 (National Health Examination Survey Network, 2010) which reported that 50% of children aged two to five ate crisps or extruded snacks every day or almost every day.

Channels through which children received unhealthy snacks from people in their social circle, starting with kindergarten and the journey home. From the observation, it was easy for the children to get unhealthy snacks, at kindergarten, on the way home, or at home. Places and actors (gatekeepers to snack consumption) that support children accessing unhealthy snacks can be illustrated through a child's daily journey from kindergarten to home. Figure 2 summarises these channels and details where and how the children obtained unhealthy snacks. Children can access to unhealthy snacks at kindergartens through snacks stalls, receiving snacks as rewards from teachers or gifts from peers. On the way to home, convenience stores on the way and snacks in cars are main sources of unhealthy snacks available for children. At home, parents manage snack storage, some would give snack money to children, and getting snacks through other family members including siblings are pre-schoolers' snacking sources.

(1) At kindergarten

At kindergarten the children had unhealthy snacks on many occasions and from a multitude of sources. These included bringing them from home, being given them by peers or adults and buying them from the kindergarten snack stall. The latter was the established channel for access to snacks at kindergartens. New Market and Temple Side kindergartens had such stalls, one owned by catering staff and another by kindergarten's owner. Children with cash can buy snacks from the stalls which were available to children in the morning, at lunchtime and in the evening, after the kindergartens closed. Furthermore, older siblings and friends sometimes shared their snacks with younger ones.

After kindergarten while waiting for their parents, on the way home and at home were three common snacking times for pre-schoolers. At these times they were likely to have the power to make snacking choices (some had more power than others as they had snack money). Snacking after lunch or after kindergarten finished, when the children were allowed to buy or eat snacks brought from home, was harder to control, especially where there were snack stalls in and around the kindergarten. Figure 3 shows the snack stall at New Market Kindergarten. A sweetened drink and other carbonated drinks were available at both the stalls.

The sellers found providing fresh fruit at their kindergarten snack stalls difficult. They reflected that it was difficult to find fruit that the children preferred to other snacks and to prepare and store it, as fruit lasts no more than a day once peeled and cut. Additionally, fruit was usually offered free of charge twice a week with lunch.

Apart from the established channels for obtaining snacks such as kindergarten snack stalls, children also received unhealthy snacks from their peers, as rewards from their teachers, and at special events. Teachers of all three kindergartens used sweets to reward children when they answer questions in classrooms. Sharing snacks with peers was popular at the kindergartens. For the children this was a way to socialise and learn to share what they had. Tee (a four-year boy attending New Market Kindergarten), whose mother had good control over him eating unhealthy snacks and sweets, enjoyed them very much when his friends brought and shared them at kindergarten. Children also obtained snacks from other children's parents.

(2) On the way home from kindergarten

After picking their children up from kindergarten in the evening, all families, regardless of socio-economic status, provided a snack for them, bought from stalls in or around the kindergarten, from a convenience store or supermarket on the way home, or waiting in their private car. Many families in this study used convenience stores for their children's breakfasts and some dinners. This is in line with the National Health Examination Survey 2014 that showed families living in Bangkok use convenience stores to obtain their food. A huge variety of unhealthy snacks is offered at stores in the area that the children can easily spot. This can motivate them to demand such snacks and sugary drinks. Some parents admitted that they did not like stopping at convenience stores because their children usually made trouble negotiating for toys and sweets, which were commonly items that the parents restricted.

(3) At home

According to observation at their homes, 15 of the 16 families stored unhealthy snacks and sweetened drinks at home for their children. When the children, especially those who did not stop to buy snacks coming back from kindergarten, arrived home they all had a snack. This was also true of families sending children to Private Land Kindergarten, even though these children usually ate an evening meal before their

parents collected them. On my visit to Nino's family, as Nino and his older sister arrived home there were biscuits and ice cream available for them in the cupboard and refrigerator in the dining room. The children knew where they could find the snacks and sweetened drinks they preferred, and it is normal that they have them after school.

Nino asked his mother, 'I want chocolate ice cream, do we have chocolate ice cream?' His mother checked the freezer and pulled a vanilla ice cream out, handing to him, saying 'No, we ran out of chocolate ice cream; this is the last one'. Nino took the ice cream from his mother, mumbling about chocolate ice cream as he ate it (Observation, June 2014).

Giving the children snacks was common to all the parents and family members in this study of 16 families with 18 children. The children saw snacks and drinks as routine. For example, Tam's and Nid's routine on their return home involved drinking iced tea from their bottles in front of the TV.

On their arrival home Tam and Nid (three-year-old boys attending Temple Side Kindergarten) were told to take a shower. They then picked up their baby bottles filled with iced tea to drink while watching TV. 'This is their routine' said the grandmother. (Observation, April, 2014)

Apart from parents, other family members can also be important actors involved in pre-schoolers' access to unhealthy snacks. Pre-schoolers living in an extended family or with older siblings were likely to have better opportunities to access unhealthy snacks and sweetened drinks.

The residential areas where the families of both high and low socio-economic status lived provide easy access to unhealthy snacks. They are surrounded by convenience stores and groceries that sell unhealthy snacks and sweetened drinks. The shops are less than a five-minute walk away for young children, who can also be driven by families with cars. Some children were allowed to walk to the shops in their community area by themselves or to go out to a mobile snack stall that stopped by their house; the neighbours know one another well and the shops are close enough for parents to watch their children. In other cases, children persuaded their parents, other family members to accompany them to the shop and buy the snacks they wanted. The physical environment of residential area, e.g. the location of a shop not far from the house (100 metres), a familiar shopkeeper who was very helpful and keen to offer the children unhealthy snacks in child-friendly small affordable packets and who knew each child's favourite snack, was very supportive of children consuming unhealthy snacks.

Parents and family members can be role models for healthy snacking at home by having routine snacking—arranging times for snacking and choosing healthy snacks. The organisation of the home environment, e.g. whether parents make healthy snacks available and accessible to children or keep carbonated drinks and unhealthy snacks at home, play an important role in constructing children's snacking practices. Patrick, Nicklas (14) reviewed children's eating patterns and described the availability and accessibility of fruit and vegetables as one of key factors affecting children's consumption. They described 'availability' as healthy snack choices such as fruit being made available at home and

'accessibility' as the healthy snack being offered in a form that encourages children to eat it, such as peeling and cutting up fruit.

I observed that Liz usually brings a box of fresh orange (peeled and cut into small pieces) to eat as her snack at kindergarten. Her father explained that the girl does not like fruit and vegetables and the types of fruit that she could eat, one of which is oranges, are very limited. Even though it is a specific type of imported orange the father said they have to look for it and prepare it for her. (Observation, May 2014)

Healthy snacks are more expensive and time-consuming to prepare and to persuade children to eat than unhealthy snacks, which are readily available at convenience stores, well-packed and easy to store, and which are preferred by the children. Most of the households participated in this study made unhealthy snacks widely available and easily accessible to the children. This is in line with a review of qualitative studies from various settings by Krolner, Rasmussen (15) confirming that the availability of alternative unhealthy snacks is one of the factors preventing children from eating fruit.

Snacks, especially unhealthy options such as crisps and sweets, were perceived by the children as a treat they preferred to their meals and milk. Parents showed their concern about their children snacking with regards to a variety of factors ranging from dental problems to the habit of buying snacks for their promotional toys. Perceiving that snacks are not good for children and can prevent them eating their main meals, parents tried to make rules to control this. Their common ways of controlling their children's consumption of unhealthy snacks included prohibiting certain types of snacks, especially sweets; limiting the amount of money they gave their children or the snacks they ate to not more than two packets of crisps a day; limiting their access to snacks by not taking them to shops; and conditional snacking, with children having to finish their meal before being allowed snacks.

Although the parents tried their best to regulate their children's snacking it was very difficult to control all aspects of this and most chose to control only the parts they perceived as particularly problematic such as eating sweets, which can cause dental problems. Sand's mother limited both the type and amount of snacks that her son could consume:

We have a rule about buying snacks when we go to a supermarket together. The kids can buy one or two packets each depending on how often the family goes shopping...I've taught the kids that sweets are not good for their teeth. When Sand chooses snacks from a store he asks whether they are acceptable. I let them have crisps and extruded snacks, but not too much, about one or two small packets a day. (Interview of Sand's mother, January 2014)

According to observations and interviews with parents, their implementation of these rules was not always successful. It depended on many factors that shape the children's snacking practices, for example, children's characteristics and home environment.

While limited amounts of healthy snacks such as fresh fruit are provided for children both at kindergarten and at home, the children in this study had easy access to various types of unhealthy snacks and

sweetened drinks on a daily basis, despite the parents' rules to control such consumptions

2. Factors leading to the consumption of unhealthy snacks

In addition to pre-schoolers' easy access to unhealthy snacks other factors influenced their consumption included the child's character, parents' socio-economic status, family rituals, specifically stopping and spending time at convenience stores or supermarkets together, and children receiving money for snacks.

2.1 Children's character: difficult eaters have better access to unhealthy snacks

In this study children's character influenced how parents managed their snacks. Some of the children were defined as 'difficult eaters' by their parents and teachers, who usually refused to eat their meals and drink their milk at kindergarten and at home. Parents adapted their feeding practices and offered food and snacks that the children would eat including sweets, pastries, fries and extruded snacks because they ate very little and their parents did not want them to go hungry or not have enough energy for their daily activities. Consuming even a small amount of energy or nutrition was acceptable for these parents. This finding is in line with A review by Bergmeier et al. (2014) who found a correlation between traits of poor self-regulation, distress at limitation, low and high soothability, low negative affectivity and high BMI in pre-schoolers, adding that children's temperament is associated with how their parents feed them and their weight status.

Giving children a snack instead of a meal; however, can result in trading nutrition for 'eating'.

The mother of Tintin (three-year-old boy attending Private Land Kindergarten) encouraged him to eat the snacks and biscuits she put on the dining table. She also kept other snacks in the house, making them easily accessible for him. His mother explained 'I do not limit the food or snacks that Tintin eats...he is so picky and eats very little...I just hope he will eat anything...you can see he is underweight...his doctor also told me so'. (Observation, August 2014)

Such provision of snacks to encourage children to eat at least something resulted in substituting unhealthy snacks for the main meal. This may not result directly in the development of childhood obesity through overconsumption but it can affect the quality of the energy that children consume: instead of consuming a main meal with balanced nutrition a child may be filled with energy-dense snacks and may not receive the daily nutritional requirements.

2.2 Family wealth: Management of children's snacks on a limited budget

Budget was another factor affecting the management of children's snacks at home. All families, regardless of economic background, managed to provide regular snacks for their children. Households in the lower socio-economic group found ways of creating snacks on their limited budget; for example, they replaced the green tea drink with a red cordial and bought extruded snacks in bulk to reduce costs.

The grandfather of Bright (four-year-old boy attending Temple Side Kindergarten) explained that normally when he was to pick the boy up from kindergarten he would prepare small packets of crisps or extruded corn snacks at home and put red cordial drinks in bottles and put them in the refrigerator to make it unnecessary for the boy to stop at the 7-eleven on the way home. (Observation, April 2014).

2.3 Family rituals: Stopping by convenience stores or supermarkets

After the long day at kindergarten, stopping by a convenience store or supermarket on the way home was found to be a relaxing activity for many families across all socio-economic backgrounds. All families visited these stores on the way home on one to three days a week. Five households reported that they stopped at these stores every day even if they did not buy anything; it was their routine way of spending time together. Stopping at a convenience store to buy some snacks was a joyful moment for the children. Stopping at a convenience store, which involved taking the children into environment with unhealthy snacks, is attached to another social value, family bonding, and is not purely about entering the store to buy, or not buy, snacks. Even though some parents expressed concern and regulated their children's purchases at such shops, many children in this study managed to negotiate for their preferred items; for instance Aim chose to buy a sweetened yoghurt drink rather than the sweets prohibited by his mother, and Tuinui and Pearl ended up buying unhealthy snacks rather than the toys that their mothers would not let them have. (Observation, June, 2014)

2.4 Provision of snack money

All six children who attended New Market Kindergarten in the sample could buy snacks from the kindergarten snack stall with their daily snack money of about 20 THB (0.50 GBP). At Temple Side Kindergarten some children received very small sums of 5-10 THB (0.10-0.20 GBP), which buys a portion of steamed rice or a glass of carbonated drink. The provision of snack money to young children was observed in the group of children who went to the two kindergartens with snack stalls. It suggests that the provision of snack money might not depend on the socio-economic status of the family but on the environment and norms.

According to in-depth interviews with parents, those who gave snack money to their children worried that their children might get hungry^[1] or not have enough food for lunch, so the snack money enabled them to get something to eat. Some parents gave snack money as well as preparing additional snacks for their children to take to kindergartens. The amount of money increased with the children's age as well as with

reference to their peers. Parents talked to each other and sometimes asked their children how much their friends received as a daily allowance.

Children had their ways of managing their daily allowance. Most spent it all at the kindergarten snack stall. Some children managed to save their money or kept it to spend at other shops on snacks they liked, especially when the kindergarten stall did not sell their favourites. This event suggested children can use their purchasing power to select the shops that offer the snacks they prefer. The kindergarten environment played a part in their snack consumption through the kindergarten snack stall. However, this does not mean that children at a kindergarten without a snack stall always avoided unhealthy snacks. Even if a kindergarten does not make a snack stall available or sells only healthy snacks such as less-sweet fruit, a child may or may not purchase what is on offer since they can spend their money elsewhere, for example at a mobile snack stall outside the kindergarten or a shop next to their house. Furthermore, findings from this study suggest that there is a wide range of channels through which pre-schoolers can easily access to unhealthy snacks.

Only a limited number of studies touch on the topic of snack money given to pre-school children, leaving a gap in understanding both the reasons behind its provision and its effects on child-rearing and ultimately on the children's health. This is partly because in many settings pre-school children rarely receive pocket money due to their kindergarten not allowing such a practice, but this is not the case in Thailand. In this study the parents of pre-schoolers in selective kindergarten environments (Temple Side and New Market Kindergartens) gave their children money to buy snacks. This is specific to the Thai context where children of pre-school age receive such money for snacks. Most studies about snack money have been performed among primary school students or adolescents. A number of cross-sectional studies of school students aged 6-18 seeking an association between pocket money and obesity using BMI as a proxy, have found that pocket money is a significant predictor of overweight and obesity among schoolchildren in many settings, including Chicago (16), Jordan (17), Kashmir (18), Chennai (19), and Egypt (20).

This study explains the reasons behind parents giving snack money to their pre-schoolers. They see such money as a pot to spend when their children do not have enough food, and this ensure children are not left hungry during the day when they are away from their parents' care. This suggests parents' uncertainty or mistrust towards the kindergartens to which they send their children. The evidence points to the social environment at kindergartens influencing how snack money is arranged; for instance, children negotiated with their parents for more snack money once they learned how much their peers, especially older children, received. This is illustrated in the case of Sand's older sister:

Sand and his sister received 20 and 30 THB daily allowance respectively. Sand's sister negotiated for more with her parents, who guessed that she was comparing her allowance to that of her friends, who in some cases received up to 60 THB per day. (Interview of Sand's mother, January 2014)

3. Adults' perception and practices regarding their children's snacking

The adults' underpinning values and information were reflected in their actions in relation to snacking policy and practices. This section illustrates the values, regarding pre-schoolers' snacking of individual adults such as teachers and other adults, parents and other family members who were close to the children, and how they expressed them in practice. Three main values influencing snacking practices arranged by adults for children under their care are: snacks as a treat or as reward; and snack is a treat, so let the child make a choice.

3.1 Snacks as a treat or a reward

Apart from providing snacks between meals to prevent children being hungry, snacks were perceived as a treat for children both on daily basis and on special occasions. Going to kindergarten was perceived by parents as children's daily task and that they were sent away from home for hours to fulfil this educational task. Thus, when the children came home from kindergarten they should be treated. 'Are you hungry?' was one of common questions that parents asked their children when they got home, suggesting that this is a point when parents are keen to resume their caring role after leaving the child at kindergarten.

Parents in this study reflected that purchasing snacks as a daily treat for children, even if they knew them to be unhealthy, was better than buying them more toys, which cost more and which they perceived as 'useless'. Many parents emphasised that their children had already had a lot of toys at home.

Yes, we stop by the 7-Eleven almost every day...but I didn't really want her to stop...she always cried and begged for toys there, you know, they were expensive and not useful. So, I told her that she already had some of them at home. ... When it comes to snacks, I do not control her, she can get anything she wants. (Interview of Tuinui's mother, July 2014).

Providing children with snacks was a way for parents to express their love by giving them things that they enjoyed at a reasonable cost and with the perceived benefit of energy and nutrients. On special occasions I observed that all three kindergartens in my sample used snacks as a reward to appreciate children's achievements, such as sweets in the classroom when children answered the teachers' questions or behaved well.

3.2 It's a treat, let the child choose

Of the treats that the children received on daily basis, crisps, extruded corn snacks and other deep-fried snacks were what they most preferred. The parents wanted to give them snacks that the children would be happy to consume and were within their budget, easy to obtain and not perceived to be harmful to

their children. Some parents were concerned about sweets, which they acknowledged to cause dental caries and the gas in carbonated drinks, which was believed to cause stomach-ache.

Once Neutron's friend gave him a lollipop,^[2] the sort you have to keep in your mouth for a long while until it dissolves. Neo showed me the lollipop; I suddenly threw it in the bin and reminded him that I had told him not to eat this sort of sweet as it would create tooth decay, and if I say no, I really mean it. (Interview of Neutron's mother, July 2014)

Kao and April drink Coca-Cola, and the fridge was full of this drink. Their mother explained 'Their father likes to drink Coke and that sort of drink every day so it is impossible not to let [the children] copy their father, but I keep telling them that fizzy drinks will give them stomach-ache because there is a lot of gas. (Interview of Kao's and April's mother, June 2014)

The only snack that parents in the high and middle socio-economic groups (six and three families respectively) forbade their children to consume was sweets.

Values that adults, including parents and teachers, have about children snacking influence how they organize children's snacks. Children played a part in decisions about the selection and consumption of their snacks. Although adults admitted that they knew unhealthy snacks were not beneficial to the children in terms of adding nutrition to their bodies, snacks were still valued as rewards or treats, when thus adults let them choose what they wanted, and to them children going hungry. Some parents even gave children a powerful tool: their snack money gave them the authority to manage their own snacking. Parents' attitudes, behaviour and feeding styles are familial factors affecting children's snacking practices (14). Parents in this study showed conflicting values regarding providing snacks for their children. On one hand, snacks were perceived as treats or rewards for children, aiming to make them happy. On the other hand, they knew that children would choose unhealthy snacks such as sweets or high-energy/salty snacks such as extruded potato snacks and crisps. When a child chose fruit for their snack this was like a bonus for parents.

Data from previous sections have illustrated external structures as preconditions for snacking practices. At kindergarten and in the local residential area, a number of snack stalls that could easily be accessed by young children were observed, regardless of adults' rules to control their snacking. Other structures that were presented include the socio-economic status of the parents, rituals been developed among family members including the children, and the culture of providing snack money, a tool that is linked to adults' parenting value ensuring that their children should not go hungry during the day when away from home. Other values embedded in the external structures is the concept of snacks as treats and rewards attached to children's snacking practices which partly shapes how adults negotiate and make decisions about what snacks to select for their children, e.g. chocolates or sweets being used as treat/rewards, while this is not the case with fruits.

4. Children's actions and perceptions regarding snacking

This section presents how young children acted according to the structure of snacking practices organized by adults. Routine snacks implemented by adults gradually shaped children's ideas and actions regarding snacking. All the children in this sample showed positive responses to snacking and unhealthy snacks. Children from the three kindergartens were excited about discussing their favourite snacks with the researcher during data collection. They could clearly identify the snacks and brands that they liked. Some could even identify shops (or the shopkeeper's name at a local grocery); they could purchase snacks and recall certain snacking situations, for example when their teachers had given them sweets as a reward in class for participating in class activities. They keep updated about the promotional gifts and offers that came with snacks and soft drinks.

Sand's mother explained: he mainly buys snacks that include small toys like a robot model, sticker, or cards, not because of the flavor...Sometimes he just wanted to get the toy and threw away the snack...I told him this was not allowed. After that he tried to eat up his snack in order to be able to buy certain snacks with toys. (Interview of Sand's mother, January 2014)

In the kindergarten environment, snacks and the promotional toys that were mostly included with corn/potato extruded snacks were used by children as a topic of discussion as well as to socialise with others who had the same promotional toys in the form of collectable cards, swapping and showing their collections to their peers. Some tried to keep up with their friends by getting the same promotional toys. This was found in the older group of five-year-olds.

Children learned that they had different power to negotiate for their preferred snacks in both settings, i.e. they had more power to negotiate with their parents at home, although at kindergarten they still managed to avoid food they did not like and to get snacks they liked. Children learned that they could get more snacks when they were at home at the end of the day, so some might not put much effort into getting the snacks they wanted when they were at kindergarten. Strategies that they used to obtain snacks included negotiating with peers, older siblings (who had better access to snacks) and other adults (e.g. their peer's parents or teachers).

Conclusions

An ecological system theory (EST) was employed as a framework to explore factors influencing snacking practices that could lead to imbalanced consumption at different levels of the social environment and how these influence pre-schoolers snacking practices via their caregivers, namely their parents, family members and kindergarten teachers. Pre-schoolers and caregivers and their interactions around snacking were a focus; however, national and institutional policy and interventions that influence such practices were also investigated.

Analysing data from this study using EST helps identify factors in the macro- and exo-systems relating to snack consumption as illustrated in Figure 4. These are the Department of Health guidelines and kindergarten policies on the management of snacking, which support fruit as a snack at kindergartens twice a week; the kindergarten environment, for example whether the kindergarten has its own snack stall

for children to purchase snacks from; and the commercial environment surrounding kindergartens. Considering the kindergarten as an exo-systems institution in the EST, findings from this study highlight kindergartens' conflicting roles. First, the kindergarten as an institution is supposed to model healthy eating practices and implement government policies to support healthy snacking. However, the institution wants to implement interventions in response to its own policy (e.g. pleasing children/parents or profiting from selling snacks). Without shared values informing the macro-level policy promoting healthy eating and the exo-level policy promoted by kindergarten directors and teachers, it is unlikely that promotion of healthy eating interventions will produce successful results.

Apart from identified factors at macro- and exo-systems, children's agency also play roles in shaping snacking practices. Pre-schoolers also exercise power in negotiations with caregivers. They learn to use tactics to negotiate for what they prefer and that they have power that they can exercise, especially within their households. Children's agency and their desire for their preferred snacks were shaped and influenced by surrounding factors including the example of their peers and snack industry advertising. Furthermore, pre-schoolers learned that snacking was a routine activity that adults organized for them, as illustrated by the kindergarten routine milk and snack break and being given a snack after coming home from kindergarten.

Implications For Research And Practice

One of the original contributions of my study is that throughout my analysis of the snack consumption, I have presented the children's eating practices as well as the caregivers' feeding practices that were likely to lead to the development of childhood obesity. Practices such as giving children money to buy their choice of unhealthy snack that my study found addressed the need to explore and understand whether and how macrosystem factors, e.g. government campaigns and industry advertising and sociocultural factors (e.g. values) influence these practices. I argue that such practices are supported by underlying adult values such as 'a snack is a treat, let the child choose'. These values are shaped by government and private sector policies and campaigns. As I highlighted above, children's agency is another important consideration in the process of snack consumption. Children of preschool age can negotiate to achieve the result that they want: eating their preferred dish in their preferred environment. In addition, the children's negotiations are supported by values that are embedded in their parents' childrearing practices.

Findings from the three kindergarten case studies may not allow generalisation of the factors and mechanisms involved in the snacking practices in these settings. However, the case studies provide details and mechanisms in different environments and under different educational policies: for instance, the local authority and the private kindergartens employed different policies for the arrangement of the children's snacks provision.

Findings about sociocultural factors promoting childhood obesity—values are a significant part of my findings and confirmed that study of sociocultural factors are as important as economic factors and are equally needed for understanding of childhood obesity problem. This increasing problem is complex,

involves a number of influential factors which are context-specific and requires in-depth understanding of the root of the problem to guide development of policy and intervention that can best tackle it. I encourage an application of studies aiming to understand the problem rooted in various contexts, especially those settings from the global South where the problem is expanding but with limited evidence to support the design of intervention to tackle the problem.

Declarations

. Ethics approval and consent to participate:

This research study was approved by the International Development Research Ethics Committee, University of East Anglia and the Institute for the Development of Human Research Protections (IHRP) in Thailand in August 2013. The written consent form was used for observation of the kindergartens by the headmasters and teachers. A written consent form was used (and welcomed) at the kindergarten and a verbal consent was used and preferred by the parents and was suitable for the preschool participants (aged 3-5 years old). Individual families told me they would not feel comfortable signing the document, and some saw signing a form a strange thing to do as they had invited me into their house as a guest. Pre-schoolers' verbal consent was applied once their parents (guardians) had consented to their participation in the study. The ethic committee had approved this consent procedure.

. Consent for publication:

Not applicable

. Availability of data and material:

The datasets during and/or analysed during the current study available from the corresponding author on reasonable request.

. Competing interests:

The author declare no competing interests

. Funding:

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. Authors' contributions:

JY designed the study, collected and analysed the data and drafted the manuscript.

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Figures

Snacks practices (10)	<ul style="list-style-type: none"> • Daily snack money • Child's food preferences • Difficult eaters • Easy eaters 	<ul style="list-style-type: none"> • Express love for the child • Extended family • Health concern 	<ul style="list-style-type: none"> • Influences from grandparents • Kindergarten and home relationship • School food
Children's agency (13)	<ul style="list-style-type: none"> • Child's food preferences • Difficult eater • Easy eater • Easy food for children • Extended family 	<ul style="list-style-type: none"> • Siblings, carers or peers as role models • 'Boys should eat more than girls' • Home cooking • Influences from grandparents 	<ul style="list-style-type: none"> • Let child choose food • Media exposure • Only child • Raised by grandparents
Lifestyle and living conditions (12)	<ul style="list-style-type: none"> • Child's busy schedule • Family meal • Family ritual • Parents in full-time work 	<ul style="list-style-type: none"> • Home cooking • Influences from grandparents • Kindergarten and home relationship • Nuclear family 	<ul style="list-style-type: none"> • Parenting • Parents with time to take care • Raised by grandparents • Separated parents
Parents' knowledge and information (5)	<ul style="list-style-type: none"> • Knowledge of parents • Advice from physicians 	<ul style="list-style-type: none"> • Media exposure • Weight management plan 	<ul style="list-style-type: none"> • Health concern

Figure 1

Themes emerged from the data coding

Figure 2

Summary of channels through which a child can obtain unhealthy snacks from kindergartens to home

Figure 3

Kindergarten snack stall

Figure 4

Summary of influential factors influencing snacking practices of pre-schoolers identified from this study

Supplementary Files

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