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Association between food marketing exposure and consumption of confectioneries among pre-school children in Jakarta

Maria Meilan Y Fernandez[1,2], Judhiastuty Februhartanty[2*] & Saptawati Bardosono[1]

[1]*Nutrition Department, Faculty of Medicine, Universitas Indonesia/ Dr Cipto Mangunkusumo General Hospital, Jakarta, Indonesia;* [2] *Southeast Asian Ministers of Education Organization Regional Centre for Food and Nutrition (SEAMEO RECFON)/ Pusat Kajian Gizi Regional (PKGR) Universitas Indonesia, Jakarta, Indonesia*

ABSTRACT

Introduction: Prevalence of obesity among pre-school children in Indonesia is increasing. Since food advertisements reach all age groups, this study was conducted to assess the association between food marketing exposure and children's consumption of confectioneries at home. **Methods:** Two hundred and forty caregivers of children aged 3-5 years attending 25 early childhood education centres in Central Jakarta, were interviewed in this cross-sectional study. A structured food frequency questionnaire was used to determine food marketing exposure and child dietary consumption. Chi-square tests compared consumption of confectioneries with different levels of marketing exposure. **Results:** Out of a total 240 caregivers, most were mothers of the study children (79.2%) and other family members (19.2%). The majority of the caregivers did not work (81.7%), and <15.0% had graduated from university, while 42.0% lived with extended family members. The top ten confectioneries consumed by the children included chocolate wafer crisp, chocolate stick and soft candy. Among the most common food marketing practices were as advertisements on public transport, print and electronic media. The significant associations between four food marketing practices and consumption of eight types of confectioneries were key findings of this study. Receiving food promotion through short message service (SMS) was not significantly associated with consumption of the top ten confectioneries. **Conclusion:** A positive association was found between food marketing practices and consumption of confectioneries by pre-school children in Central Jakarta. An appropriate policy on food advertisements that targets children combined with parental food education is recommended for improving food consumption habits of young children.

Keywords: Dietary consumption, food marketing, preschoolers, sugar and confectionery products, Indonesia

*Corresponding author: Dr. Judhiastuty Februhartanty
SEAMEO RECFON, Jl. Salemba Raya 6, Central Jakarta, 10430, Indonesia.
Tel: +628129260634, Fax: +62-21 3913933
Email: judhiastuty@yahoo.com; jfebruhartanty@seameo-recfon.org

INTRODUCTION

The prevalence of overweight and obesity among children worldwide has increased in the past two decades. The World Health Organization (WHO) stated that in 2013, the number of overweight children who were < 5 years of age was estimated to be over 42 million globally. Many were from developing countries (WHO, 2016a). De Onis, Blossner & Borghi (2010) described an increasing trend of overweight-obesity prevalence among pre-school children that accounted for 3.2% in 1990, 4.9% in 2010, and is estimated will be 6.8% in 2020 in Asia alone. The Indonesian Basic Health Research (*Riskesdas*) has revealed a similar trend of increasing prevalence of overweight among under-fives from 3.9% in 2007 to 5.1% in 2013 (NIHRD, 2013). Childhood obesity is a strong predictor of obesity in adulthood. WHO (2016b) and Gatineau & Mathrani (2011) have noted that the consequences of childhood obesity include non-communicable diseases (NCDs), such as type 2 diabetes, cardiovascular diseases, metabolic syndrome, osteoarthritis and cancer in young adulthood.

Current social environment unconsciously encourages weight gain and obesity among children. The WHO (2016b) reported of changes in food availability and types, and decline in physical activity in terms of transport and playing among children, lead to energy imbalances. Whiney & Rolfes (2008) showed that children live in environments that expose them to an abundance of high-calorie and high-fat foods that are readily available, relatively inexpensive, heavily advertised, and reasonably tasty. This situation is described as being in an 'obesogenic environment' (Swinburn, Egger & Raza, 1999).

Obesity in children is increasing due to their preferences for foods such as instant foods that are energy-dense, high in fat and sugars but low in vitamins, minerals and other micronutrients (WHO, 2016c; de Lira-Garcia, Bacardi-Gascon & Jiménez-Cruz, 2012). Research suggests that children naturally prefer sweet and savory foods and generally reject sour and bitter tastes. Taste preferences are developed from early childhood experience and through repeated exposures (Liem, 2004). Children appear to prefer foods that are energy dense due to their high sugar and fat contents (Brown *et al.*, 2011). Over consumption of foods which are energy dense but poor in micronutrient content contribute to child adiposity (Zhou & Zhang, 2014). The high consumption of sugar-sweetened beverages has been associated with obesity as a result of the replacement of more nutrient dense foods. High sugar consumption also adversely affects dental health (Scafida & Chambers, 2017).

The foods that are considered confectioneries are candy, syrup, chocolate, chocolate chip/morsel, jelly, gelatin, and honey (Siswanto, 2014). Sweet, salty and high fat content foods are included in many widely advertised foods (Kelly *et al.*, 2010). According to Worsley & Ridley (2014), exposure to food marketing is defined as the frequency that one sees food advertisements in a period of time. These include special offers, competitions, and giveaways of food/drink products. The high intake of energy dense food among children has been shown to be stimulated by food advertisements through television, the Internet, promotional campaigns and retail environments (Sonntag *et al.*, 2015).

Young children are more susceptible to the effects of marketing than adults (Story & French, 2004). Child-directed advertisements are more likely to feature appeals of fun, taste, humor, fantasy, action/adventure, desirability, and mystery (Edmund *et al.*, 2015). Marketers

target children, in part, because of their 'pester power' and subsequent influence on food purchases by the family (Pettigrew & Roberts, 2007). Children are also direct consumers (Sharma & Dasgupta, 2009). "Children's desires" (e.g. food likes) and health needs were among the top motives in the selection of foods and drinks by parents for their children (Russell, Worsley & Liem, 2014; Rigo *et al.*, 2018).

There is a lack of studies in Indonesia on food marketing exposure and dietary consumption of young children. The capital city, Jakarta provides an appropriate setting for investigating the role of food marketing exposure as children are frequently exposed to the high volume of food advertisements in the city. The aim of this study is to determine the association between food marketing exposure and consumption of confectioneries among pre-school children in Central Jakarta.

MATERIALS AND METHODS

Study design and sampling procedure

This cross-sectional study was conducted in Jakarta in May 2017. The respondents were caregivers of pre-school children, with apparently healthy children aged 3-5 years, who attended pre-school in Central Jakarta. Children and/or caregivers who had physical disability or suffered from serious illness were excluded. The sample size needed was 240 children. This figure was calculated based on an estimate of 45% of children exposed to food advertising (Harris, Bargh & Brownell, 2009) with 95% confidence interval, 10% absolute precision, and a design effect of 2.5 to anticipate the variations between the centres/schools as the sampling unit. Out of a total of 321 centres/schools that provided early childhood education for children aged 3-5 years across eight sub-districts in Central Jakarta (Ministry of Education and Culture, 2017), 25 were randomly selected, using a software called ENA for Smart version 2011 (Nutrisurvey, Germany). The data from the online source consisted of the number and name of the centres/schools, address and whether they were private or national (government owned) schools.

Before conducting the study, the researcher visited the selected centres/schools, and explained to the headmaster/principal the purpose of the study and the criteria for the selection of the respondents and their children. Children who appeared healthy and aged 3-5 years were included in the study. The number of eligible children who were included in the study was between 11-15 per centre/school. None of the respondents screened was excluded. Informed consent was obtained from the respondents before the interview.

Instrument development and data collection procedure

Data collected included the:

(i) frequency intake of confectioneries at home among the children, using a structured Food Frequency Questionnaire (FFQ);

(ii) demographic characteristics of the family such as child's sex, respondent's educational background, occupation, household socioeconomic status obtained from possession of assets and housing condition.

(iii) frequency of the food marketing exposure of the respondent and/or the child by way of special offers, competitions, or giveaway food/drink products in the past week through various media (television, game-internet, short message service blast, billboards, school competitions, magazines, supermarket toys, etc.), as adapted from Worsley & Ridley (2014).

The list of confectioneries used in this study FFQ was adapted from the Indonesian Total Diet Survey (TDS) by Siswanto (2014). The confectioneries included were candy, syrup, chocolate, chocolate chip/morsel, jelly, gelatin, and honey (Siswanto, 2014). These types of confectioneries were commonly seen advertised in various media outlets such as television, internet based social media i.e. e-mail, Facebook® and Instagram®, short message service (SMS), on transportation vehicles, print media i.e. brochures, flyers, etc., which were sold in the market places such as street stall/kiosks, mini market, supermarket, fast food restaurants. The researchers conducted observations in nearby markets, stalls, small shops, traditional markets, and other food retailers, to further verify that these confectioneries were available on the premises of the study. The final list of confectioneries used is shown in Table 2. In addition, a booklet containing photographs of the confectioneries listed in the FFQ was used to assist the respondents in recalling which confectioneries their children had consumed in the past one month.

The FFQ and other questionnaires were pretested before data collection. The interview was conducted after school hours when the caregivers picked up their children from school.

Data analysis

The data was analysed using SPSS version 20 for univariate and bivariate analysis with 95% confidence interval. Household socioeconomic status was defined as 1^{st} – 3^{rd} tertiles obtained from making a composite variable based on household assets and housing condition. The frequency of food consumption was defined as 'ever consumed in the last month' by the children. A total of 26 confectionery categories was included in the FFQ, and the response was arranged from the most frequently consumed confectionery by the children to the least frequently consumed. Only the top ten commonly consumed products were included in the bivariate analysis.

The types of food marketing exposures in this study were categorized into (i) exposure from the media, and (ii) exposure from supermarket related promotion, based on Avianty (2016). Exposure from the media consisted of advertisements (i) seen on public transport, (ii) seen in a magazine/ newspaper, (iii) received via email, social media, television, (iv) seen at school, and (v) received via SMS. Meanwhile food marketing exposure from supermarket-related promotions included (i) food or drinks purchased from vending machines, (ii) buying extra food or drinks on display at the supermarket checkout, (iii) receiving free food/drink sample at the train station, shopping centres, supermarket, etc., (iv) playing a game or entering a competition in the internet, and (v) entering a competition seen on food or drink packaging.

Out of these ten types of exposure, only the top five highest responses that were recorded in this study were entered in the bivariate analysis. The chi-square test was used to assess the association between the types of food marketing exposure with consumption of commonly consumed confectioneries.

Ethical consideration

This research proposal was approved by the Health Research Ethics Committee of the Faculty of Medicine, of Universitas Indonesia (approval number 342/ UN2.FI/ETIK/2017). Written informed consent was obtained from each participant prior to data collection.

RESULTS

Out of a total of 240 respondents in the study, nearly 80.0% were mothers of the

Table 1. General characteristics of the respondents (n=240)

Variable	*n (%)*
Child	
Boys	121 (50.4)
Girls	119 (49.6)
Respondent's relationship with children	
Mother	190 (79.2)
Other family members	46 (19.2)
Paid caregiver	4 (1.6)
Age of respondent (years)	
≤ 20	5 (2.1)
21-30	80 (33.3)
≥ 31	155 (64.6)
Highest education level of respondent	
Below elementary school	2 (0.8)
Elementary school	33 (13.8)
Junior high school	59 (24.6)
Senior high School	111 (46.3)
University	35 (14.6)
Occupation of respondent	
Working	44 (18.3)
Non-working	196 (81.7)
Wealth index of family	
1st tertile	89 (37.1)
2nd tertile	89 (37.1)
3rd tertile	62 (25.8)
Type of family	
Nuclear	140 (58.3)
Extended	100 (41.7)

children. Less than 15.0% of them had graduated from university and 81.7% had no paid work outside the home. The majority of the households were from the poorer socioeconomic group. About 40.0% of the respondents lived with their extended family (Table 1).

Twenty-six confectionery categories were included in this study (Table 2). The top ten most consumed types of confectioneries included candy, chocolate, crackers, and ice cream. The most popular confectioneries are ranked in Table 3.

The five most common food marketing practices experienced by the respondents and/or their respective children were (i) receiving advertisements promoting food products via email, social media, television (56.7%), (ii) buying additional food or drink product on display at the supermarket checkout (55.8%), (iii)promotion in a magazine, newspaper or periodical (47.1%), (iv) advertisements on public transport such as buses and trains (35.4%), and (v) via SMS (29.2%). Of all ten types of food marketing practices, five types were less common (only exposing <15.0% of the respondents and/or the child). Those practices were marketing at school, through vending machines, free sample giveaways, playing a game on the internet, and entering a competition based on food packaging (Table 4).

The association between the five most common food marketing practices and ten most commonly

Table 2. List of confectioneries listed in the FFQ

Biscuits/cakes	*Candy*	*Chocolate/wafer*	*Jelly/pudding*	*Ice cream*
1) Better crackers with cream and chocolate coated	5) Big Babol bubble gum	13) Beng-Beng wafer crisp covered with chocolate	20) Milna toddler pudding	22) Campina ice cream
2) Better soft cake	6) Chupachups candy stick	14) Cha-cha choco biscuit candy	21) Okky jelly drink	23) Aice corn ice cream
3) Gerry choco roll crackers	7) Hot hot pop candy stick	15) Choki-choki chocolate stick		24) Magnum Classic ice cream
4) Momogi biscuit choco filling	8) Kiss candy	16) Chunky chocolate bar		25) Paddle Pop ice cream
	9) Mentos candy	17) Kinderjoy chocolate candy		26) Walls ice cream cup
	10) Milkita milk lollipop	18) KitKat wafer chocolate bar		
	11) Relaxa candy	19) Silverqueen chocolate bar		
	12) Yupi soft candy			

consumed confectioneries is presented in Table 5. Food marketing exposure to magazines, newspapers and other print media was significantly associated with the consumption of the top six confectioneries, namely, Beng-beng, Choki-choki, Yupi, Milkita, Silverqueen, and Hot hot pop. This was followed by food marketing through e-mails, social media, and television which were associated with consumption of four of the confectioneries, namely, Yupi, Cha-cha, Milkita, and Silverqueen. Food advertisement on public transport and supermarket displays were each associated with two products, namely Beng-beng and Walls, and, Cha-cha and Silverqueen, respectively. Most of the confectioneries were associated with more than one marketing practice. In contrast, receiving promotion through SMS was the only marketing practice that was not significantly associated with children's consumption of any of the top ten confectioneries. Consumption of the confectioneries, Better and Kinderjoy, was not found to show significant association with any of the food marketing practices.

DISCUSSION

This study identified the top ten confectioneries consumed by pre-school children in Jakarta. The five most common food marketing practices were also found to have significant association with the consumption of several of the popular types of confectioneries. The present findings concur with reports of food marketing that targets young children (Huang, Mehta & Wong, 2011; Kelly *et al.*, 2010; Sonntag *et al.*, 2015). The caregivers and/or the children identified candy and chocolate wafer products through exposure to more than one type of marketing promotion technique. Children are fond of sweet foods and this preference may have been inculcated from an early age through

Table 3. Confectioneries consumed at least once during in the past one month (n=240)

No.	*Food product*	*n*	*%*
1.	Beng-Beng wafer crisp covered with chocolate	138	57.5
2.	Choki-choki chocolate stick	116	48.3
3.	Yupi soft candy	105	43.8
4.	Better crackers with cream and chocolate coated	101	42.1
5.	Kinderjoy chocolate candy	75	31.3
6.	Chacha biscuit choco ball	68	28.9
7.	Milkita milk lollipop	55	22.9
8.	Silverqueen (chocolate)	48	20.0
9.	Hot hot pop stick candy	32	13.3
10.	Walls ice cream cup	25	10.4
11.	Big Babol bubble gum	24	10.0
12.	Magnum classic ice cream	24	10.0
13.	Kitkat wafer chocolate bar	20	8.3
14.	Okky jelly drink	11	4.6
15.	Campina ice cream	8	3.0
16.	ChupaChups candy stick	8	3.4
17.	Momogi biscuit choco filling	7	2.9
18.	Gerry choco roll crackers	7	2.9
19.	Paddle pop ice cream	6	2.5
20.	Aice corn ice cream	4	1.6
21.	Milna toddler pudding	3	1.2
22.	Chunky chocolate bar	1	0.4
23.	Mentos candy	1	0.4
24.	Kiss candy	1	0.4
25.	Better soft cake	1	0.4
26.	Relaxa candy	1	0.4

repeated exposures (Liem, 2004). The present study found that multiple food marketing techniques could potentially intensify a child's taste preference. Advertisements with fun appeal and those which were adventure-driven were more likely to capture the attention of children (Edmund *et al.*, 2015). The potential influence of children on their parents in making purchases is the aim of marketers in targeting children (Pettigrew & Roberts, 2007; Sharma & Dasgupta, 2009). Marketing practices also target parents or caregivers as they have the responsibility for purchasing for their children (Edmund *et al.*, 2015).

Previous studies have reported the intensive use of television for marketing various food products (Huang, Mehta & Wong, 2011; Kelly *et al.*, 2010), as the television affords access to children at much earlier ages than other media (Ali *et al.*, 2012). In contrast, the present study found that the print media, including magazines and newspapers, were associated with the consumption of confectioneries that were highly preferred by the pre-school children. Byrum (2014) has suggested that the printed media such as flyers, brochures, newspapers and magazines may have a stronger impact on brand awareness compared to television.

A strength of this study is that the types of confectioneries listed in the FFQ incorporates a review on the

Table 4. Marketing practices as experienced at least once by the respondents and/or children in the previous week (n=240)

Food marketing practices	*n (%)*
Exposure from media	
On public transport (e.g. bus, train)	85 (35.4)
In a magazine, newspaper, printed media	113 (47.1)
Received via email, social media, televsion	136 (56.7)
At school (e.g. canteen, sports event)†	30 (12.5)
Received via SMS	70 (29.2)
Exposure from supermarket related promotions	
Buy food or drinks from a vending machine†	29 (12.1)
Buy an extra food or drink product on display at the supermarket checkout	134 (55.8)
Receive a free sample of a food or drink product at a train station, shopping centre, supermarket†	36 (15.0)
Play a game or enter a competition on the internet that was related to a food or drink product†	6 (2.5)
Enter a competition you saw on food or drink packaging†	5 (2.1)

†Excluded later in bivariate analysis

marketing mode used by the food producers, as well as the availability of these products in the local market places. In this way, the confectioneries are those that are and widely sold and commonly consumed by the children in the study setting. Indonesia is considered the largest foodservice market among ASEAN countries (Chen, 2016). The top three growth drivers for Indonesia's foodservice market are full-service restaurants, fast foods and street stalls/kiosks. In urban areas like Jakarta, street stalls/kiosks and mini markets may be regarded the most popular foodservice outlets since they provide affordable products (Chen, 2016). About 56.0% of the respondents and/or their children were exposed to marketing associated with product displays at supermarket checkouts. Sonntag *et al.* (2015) reported that to forge a long-lasting relationship with children and create brand loyalty in the short and long run, the food industry uses persuasive marketing techniques, such as providing attractive and emotional-appeal product packing, and using toys as giveaways.

Children are unable to understand the intent of the advertisements. Moreover, they cannot distinguish healthy and unhealthy foods by themselves (Story & French, 2004). Therefore, a restricted policy for food advertising that is targeted at children is one of the strategies strongly recommended for combating the double-burden of malnutrition and unhealthy food intake in Indonesia (World Bank Indonesia, 2012). In Indonesia, legislation on the restriction of food advertisement targeting children should be implemented and followed up with monitoring measures. Such a policy on food marketing should include internet based and social media platforms since they are able to reach children. In addition, food education for parents should focus on increasing their knowledge in providing a healthier food environment at home (Februhartanty & Khusun, 2018).

Table 5. Association between food marketing practices and consumption of confectioneries among pre-school children[†]

Sugar & confectionery products[‡]	*Food Marketing Practices*														
	On public transportation			*In magazines, newspaper other printed media*			*Received via email, social media, TV*			*Supermarket displays*			*Received via SMS*		
	Ever	*Never*	*p-value*	*Ever*	*Never*	*p-value*	*Ever*	*Never*	*p-value*	*Ever*	*Never*	*p-value*	*Ever*	*Never*	*p-value*
	n (%)	*n (%)*		*n (%)*	*n (%)*		*n (%)*	*n (%)*		*n (%)*	*n (%)*		*n (%)*	*n (%)*	
Beng-Beng	59 (69.4)	79 (51.0)	0.006*	74 (65.5)	64 (50.4)	0.018*	83 (61.0)	55 (52.9)	0.206	83 (61.9)	55 (51.9)	0.118	47 (67.1)	91 (53.5)	0.052
Choki-choki	42 (49.4)	74 (47.7)	0.804	63 (55.8)	53 (41.7)	0.030*	73 (53.7)	43 (41.3)	0.058	70 (52.2)	46 (43.3)	0.173	37 (52.9)	79 (46.5)	0.369
Yupi	40 (47.1)	65 (41.9)	0.444	61 (54.0)	44 (34.6)	0.003*	72 (52.9)	33 (31.7)	0.001*	63 (47.0)	42 (39.6)	0.252	32 (45.7)	73 (42.9)	0.694
Better	42 (49.4)	59 (38.1)	0.089	49 (43.3)	52 (40.9)	0.705	62 (45.6)	39 (37.5)	0.208	61 (45.5)	40 (37.7)	0.225	34 (48.6)	67 (39.4)	0.191
Kinderjoy	28 (32.9)	47 (30.3)	0.676	36 (31.9)	39 (30.7)	0.848	45 (33.1)	30 (28.8)	0.482	43 (32.1)	32 (30.2)	0.752	23 (32.9)	52 (30.6)	0.730
Chacha	30 (35.3)	38 (24.5)	0.076	37 (32.7)	31 (24.4)	0.153	46 (33.8)	22 (21.2)	0.031*	48 (35.8)	20 (18.9)	0.004*	22 (31.4)	46 (27.1)	0.495
Milkita	26 (30.6)	29 (18.7)	0.036	37 (32.7)	18 (14.2)	0.001*	42 (30.9)	13 (12.5)	0.001*	33 (24.6)	22 (20.8)	0.478	16 (22.9)	39 (22.9)	0.369
Silverqueen	20 (23.5)	28 (18.1)	0.311	38 (26.5)	18 (14.2)	0.017*	34 (25.0)	14 (13.5)	0.027*	34 (25.4)	14 (13.2)	0.019*	17 (24.3)	31 (18.2)	0.287
Hot hot pop	12 (14.1)	20 (12.9)	0.791	21 (18.6)	11 (8.7)	0.024*	21 (15.4)	11 (10.6)	0.272	18 (1.34)	14 (13.2)	0.959	11 (15.7)	21 (12.4)	0.486
Walls Ice Cream Cup	17 (20.0)	8 (5.2)	0.000*	16 (14.2)	9 (7.1)	0.073	18 (13.2)	7 (6.7)	0.102	17 (12.7)	8 (7.5)	0.196	8 (11.4)	17 (10.0)	0.742

[†]Chi-square test
[‡]Top ten mostly consumed sugar and confectionery products
*$p\text{-value} < 0.05$

Limitations of study

In the present study, advertisements via e-mails, social media, and television were combined in the same category of marketing practice. Hence, the influence of these media individually could not be determined.

CONCLUSION

The study determined the association between popular food marketing practices and the consumption of confectioneries preferred by pre-school children in Jakarta. Policy restrictions of food advertisements that target children should be put in place. Providing education on healthier food choices to parents/care givers can contribute to the improvement of the home food environment for children.

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Authors' contributions

FMMY, contributed to the conception and design of the work, was involved in the acquisition and analysis of the data and compiled the first draft of the manuscript; FJ, contributed to the conception and design of the work, was involved in the acquisition and analysis of the data, the critical revision of the draft and approved the final draft; BS, contributed to the conception and design of the work, was involved in data interpretation, the critical revision of the draft and also approved the final draft.

Conflict of interest

All authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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