

## ORIGINAL ARTICLE

# Relationships of family conflict, cohesion, and chaos in the home environment on maternal and child food-related behaviours

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**Abstract**

This study examined how food-related behaviours differed in mothers and their preschool children by levels of family functioning (cohesion and conflict) and household disorganization (chaos). A nationally representative sample of mothers of preschoolers completed an online survey assessing food-related behaviours of themselves and their children. Maternal and child diet, eating behaviours, and health status; household availability of fruits/vegetables, salty/fatty snacks, and sugar-sweetened beverages; family mealtime atmosphere; and family conflict, cohesion, and household chaos were assessed with valid, reliable scales. Cluster analyses assigned families into low, middle, and high conflict, cohesion, and chaos groups. Participants ( $n = 550$ ) were 72% White, and 82% had some post-secondary education. Regression analysis examining the association of cluster grouping levels on diet-related behaviour measures revealed that positive home environments (i.e., low family conflict, high family cohesion, and low household chaos) were associated with healthier food-related behaviours (e.g., increased fruits/vegetables intake), whereas negative home environments (i.e., high family conflict, low family cohesion, and high household chaos) were associated with unhealthy food-related behaviours (e.g., greater % total calories from fat) even after controlling for sociodemographic and related behavioural factors. Findings suggest family functioning and household chaos are associated with food-related behaviours. This frequently overlooked component of family interaction may affect intervention outcomes and objectives of educational and interventional initiatives.

**KEYWORDS**

children, cohesion, family conflict, home environment, household organization, mothers

## 1 | INTRODUCTION

Social ecology explores the interplay of people and their environment, recognizing that the environment and human behaviours, such as food-related practices, mutually and concurrently affect each other. An individual's immediate environment is the social environment, which is composed of a network (e.g., family, friends, neighbours, and colleagues) that interacts with each other. The social environment provides emotional, material, and informational support, a sense of belonging, and transmits group values, norms, and expectations that affect the functioning of the organization (e.g., homes, schools, and workplaces) in which the social network exists. An individual's immediate social environment is a strong determinant of behaviour.

For young children, characteristics of the social environment within the family, such as family functioning and household organization, may play a key role in physical and mental health-related behaviours and outcomes (Dickstein, 2002; Rhee, 2008). Family functioning incorporates the concepts of family cohesion and family conflict (Martin-Biggers, 2016). High levels of family cohesion provide a social environment that promotes positive emotional, mental, and physical health, whereas high family conflict typically diminishes health. The limited research examining family functioning vis-à-vis food-related behaviours indicates that compared to children and teens living in high functioning families, those in lower functioning families tend to eat fewer fruits/vegetables (Berge et al., 2014; Renzaho, Kumanyika, & Tucker, 2011), consume more fast food (Berge et al.,

2014), have poorer eating habits (Mellin, Neumark-Sztainer, Story, Ireland, & Resnick, 2002; Renzaho, Dau, Cyril, & Ayala, 2014), and increased obesity risk (Cyril, Halliday, Green, & Renzaho, 2015; Halliday, Palma, Mellor, Green, & Renzaho, 2014; Zeller et al., 2007). Women in low functioning families demonstrate more obesity risk behaviours (i.e., more screen time and more soft drink, fast food, chips, and processed meat consumption; Wen, Simpson, Baur, Rissel, & Flood, 2011). Among men, lower family cohesion was associated with less healthy eating attitudes and less control over eating (Johnson, Brownell, St Jeor, Brunner, & Worby, 1997). High levels of family conflict are associated with disordered eating in teens (Felker & Stivers, 1994; Helmcamp, 1997; Hodges, Cochrane, & Brewerton, 1998), greater obesity risk in youth (Halliday et al., 2014; Hanson, Kelesges, Eck, Cigrang, & Carle, 1990), and increased metabolic syndrome risk in women (Penedo et al., 2015). Families with low socio-economic status (SES) frequently report poor family functioning (Evans, 2004).

The concept of "household chaos" is described as an environment that is high in noise and crowding and low in routines and organization (Matheny, Wachs, Ludwig, & Phillips, 1995). Households that are organized (less chaotic) are positively associated with children's cognitive skills (Evans, 2006; Johnson, Martin, Brooks-Gunn, & Petrill, 2008; Petrill, Pike, Price, & Plomin, 2004; Vernon-Feagans, Garrett-Peters, Willoughby, & Mills-Koonce, 2012), emotional and behavioural self-regulation (Boles et al., 2016; Fontaine, McCrory, Oibvin, & Moffitt, 2011), and health outcomes (Matheny et al., 1995). In contrast, disorganized, chaotic home environments, described as being hectic, noisy, and unpredictable (Matheny et al., 1995), can impair children's cognitive performance (Matheny et al., 1995) and promote behavioural problems (Coldwell, Pike, & Dunn, 2006; Fontaine et al., 2011; Matheny et al., 1995; Vernon-Feagans, Willoughby, Garrett-Peters, & Family Life Project Key, I., 2016) and anxiety (Gregory, Eley, O'Connor, Rijdsdijk, & Plomin, 2005), diminish sleep quality (Appelhans et al., 2014; Billows et al., 2009; Gregory et al., 2005), and increase obesity risk (Smith, Montano, Dishion, Shaw, & Wilson, 2015). Of particular concern are children in low-income households because they experience greater family turmoil and chaos than their more affluent peers (Evans, 2004). Although only a single study examining the impact of household organization per se on food-related factors was located (Smith et al., 2015), it is likely that household organization affects numerous food-related factors. For instance, eating family meals on a regular basis is a recommended childhood obesity prevention strategy (Hammons & Fiese, 2011), and calm family mealtimes are associated with better quality diets (Boutelle, Birnbaum, Lytle, Murray, & Story, 2003; Burnier, Dubois, & Girard, 2011). In chaotic households, family meals eaten regularly in a calm atmosphere are unlikely.

Given the scant research examining family and household management and the potential impact of family social environment on child health practices (Montano, Smith, Dishion, Shaw, & Wilson, 2015; Smith et al., 2015), researchers have called for further study of family dynamics as it relates to these practices (Halliday et al., 2014; Sigman-Grant, Hayes, VanBrackle, & Fiese, 2015). Additionally, mothers with preschool children, often known as food gatekeepers, have a great influence on their child's weight-related behaviours, which has shown to track into later childhood and adulthood years

### Key messages

- Positive home environments (i.e., low family conflict, high family cohesion, and low household chaos) were associated with healthier food-related behaviours, whereas negative home environments (i.e., high family conflict, low family cohesion, and high household chaos) were associated with unhealthy food-related behaviours.
- Family-based health and nutrition interventions should consider addressing general family functioning and household management skills and control for these differences when examining intervention outcomes.
- Family-based interventions should also consider addressing family dysfunction and offer support and coping strategies for parents with psychological stressors.

(Freedman et al., 2005; Freedman, Khan, Dietz, Srinivasan, & Berenson, 2001; Guo, Wu, Chumlea, & Roche, 2002; Wang & Beydoun, 2007; Whitaker, Wright, Pepe, Seidel, & Dietz, 1997). Understanding the associations of family functioning and household organization with food-related behaviours in families with young children could inform the development of more effective childhood nutrition and obesity prevention interventions. Thus, the purpose of this study was to comprehensively explore how food-related behaviours differed in mothers and their preschool children by levels of family functioning (cohesion and conflict) and household organization (chaos). It was hypothesized that families with less family conflict and more household organization and cohesion would practice healthier food-related behaviours.

## 2 | METHODS

The institutional review board at the authors' university in the United States approved this research. All participants gave informed consent.

### 2.1 | Sample

Mothers who were panel members of Survey Sampling International (SSI), a global research company whose services include survey sample participant recruitment ([www.surveysampling.com](http://www.surveysampling.com)), were recruited to complete the online Home Obesogenic Measure of EnvironmentS (HOMES) survey (Martin-Biggers, Cheng, Spaccarotella, & Byrd-Bredbenner, 2016; Martin-Biggers, 2016). SSI recruited panellists based on their characteristics (i.e., women between ages 18 and 45 years, who were mothers of young children and who were the household primary food gatekeeper) and sent them a link to the online HOMES survey. SSI also aimed to recruit a sample reflective of the demographic patterns of people in the United States (i.e., educational attainment, race/ethnicity, and region of residence). Recruitment notices invited mothers to complete a survey to help

researchers “learn more about families with young kids” and to help them develop “a program for parents to build healthier kids.” Eligible participants were 18 to 45 years, English-speaking, the main household food gatekeeper, and had at least one preschool child (aged 2 to 5 years). Participants were compensated with points awarded by SSI that they could exchange for gifts.

## 2.2 | Instruments

The development of the HOMES survey is described in detail elsewhere (Martin-Biggers, 2016; Martin-Biggers et al., 2016). Briefly, it gathered sociodemographic information (e.g., mother's age, race/ethnicity, education level, household composition [single vs. dual parent household, number of children in the household <18 years of age], paid hours of employment, and the age and sex of one preschool-aged child in the home). The Family Affluence Scale, which assesses number of vehicles, computers, and annual vacations, and whether parents have their own bedroom, was used as an indicator of SES (Currie et al., 2008; Hartley, Levin, & Currie, 2016). The HOMES survey also included an array of valid, reliable measures assessing maternal and child food-related practices thought to be related to family conflict, cohesion, and household chaos based on prior research. Table 1 summarizes all measures assessed, including number of scale items, possible score range, answer choices, and Cronbach's alpha coefficients of internal consistency (when applicable). All Likert scales were scored by averaging responses to scale items; higher scores indicate greater expression of the measured variable.

### 2.2.1 | Maternal food-related practices and health status

Maternal dietary intake was evaluated with these food frequency questionnaires: Block Fruit-Vegetable-Fibre Screener, Block Dietary Fat Screener (Block, Gillespie, Rosenbaum, & Jenson, 2000; Block, Hartman, & Naughton, 1990; Block, Thompson, Hartman, Larkin, & Guire, 1992), and a Sugar-Sweetened Beverage screener (West et al., 2006). Maternal eating behaviour scales included Emotional Eating (eating in response to emotions), Uncontrolled Eating (temporary loss of control over eating), and Cognitive Restraint Eating (restricting food to prevent weight gain) derived from the Three-Factor Eating Questionnaire (Cappelleri et al., 2009; Karlsson, Persson, Sjostrom, & Sullivan, 2000; Stunkard & Messick, 1985). The Adventurous Eating scale assessed willingness to try new or unfamiliar foods (Pliner & Hobden, 1992; Pliner & Loewen, 1997; Ullrich, Touger-Decker, O'Sullivan-Maillet, & Tepper, 2004). Maternal health parameters included the general health status item (“How would you rate your general health?”) from the Centres for Disease Control “Healthy Days Measure” (Centers for Disease Control and Prevention, 2011a, 2011b) and maternal self-reported weight status (i.e., overweight status defined as a body mass index [BMI]  $\geq 25$  or healthy weight status defined as BMI < 25).

### 2.2.2 | Child food-related practices and health status

Children's dietary intake of fruit/vegetable juice and sugar-sweetened beverages was measured similarly to parents. Children's eating behaviours were reported by mothers and assessed with three brief Likert-type scales: Emotional Eating (Wardle, Guthrie, Sanderson, &

Rapoport, 2001), Self-Regulation of Eating (i.e., control of food intake by responding to satiety signals; Tan & Holub, 2011; Wardle et al., 2001), and Adventurous Eating (Wardle et al., 2001). Child health was assessed with the general health status item (“How would you rate your general health?”) from the Centres for Disease Control “Healthy Days Measure” (Centers for Disease Control and Prevention, 2011a, 2011b), and maternal self-reported child weight status defined as not overweight or overweight if BMI-for-age and sex percentile was <85th or  $\geq 85$ th, respectively.

### 2.2.3 | Household food-related practices

Household characteristics and food availability included an assessment of family food insecurity risk (Hager et al., 2010) and total family meals eaten per week (Birch et al., 2001). Household availability of fruits/vegetables, salty/fatty snacks, and of sugar-sweetened beverages was appraised using household food supply screeners (Martin-Biggers, Koenings, Quick, Abbot, & Byrd-Bredbenner, 2015; Nelson & Lytle, 2009; West et al., 2006). The Family Meal Atmosphere scale assessed how positive the atmosphere or tone was at family mealtimes (Neumark-Sztainer, Wall, Story, & Perry, 2003; Spurrier, Magarey, Golley, Curnow, & Sawyer, 2008).

### 2.2.4 | Family conflict, cohesion, and household chaos

Family functioning was assessed with the family conflict and family cohesion items from the Family Environment Scale (Greene & Plank, 1994; Moos & Moose, 1994; Saucier, Wilson, & Warka, 2007). Household chaos was evaluated with the Confusion, Hubbub, and Order scale short version items (Coldwell et al., 2006; Matheny et al., 1995). These scales had 5-point agreement/disagreement Likert responses. Item responses were averaged to create scale scores; higher scores indicate greater family conflict, cohesion, and chaos (i.e., disorganization). Because scales evaluating family environment have produced differing psychometric data with different audiences (Roosa & Beals, 1990; Saucier et al., 2007; Wollersheim Shervy, 2013), especially inconsistencies in acceptability of internal consistency, factor analysis was conducted to confirm the unidimensionality of scales and acceptability of Cronbach's alpha coefficients. These factor analysis tests resulted in elimination of one item from the Chaos scale that had acceptable internal consistency ( $\alpha = .75$ ), especially given the small number of items on the scale.

## 2.3 | Data analysis

Cluster analysis was employed to group participants based on the level of family functioning and household organization with regard to family conflict, cohesion, and chaos in the home environment. Cluster analysis is a commonly used method to discover structures within complex data (Anderberg, 2014; Kaufman & Rousseeuw, 2009). K-means cluster method, a non-hierarchical, iterative process based on a specific number of clusters, was used because of the large number of variables of interest. The optimal number of clusters was based on the Calinski-Harabasz pseudo-F index (Caliński & Harabasz, 1974; Milligan & Cooper, 1985). A larger Calinski-Harabasz pseudo-F index value indicates more distinct clusters. Descriptive statistics were computed for all study measures across the cluster grouping levels of

**TABLE 1** Analysis of variance of study measures among levels of family conflict, cohesion, and chaos (N = 550)

Measure	Cronbach's $\alpha$	#Items (possible score range)	Family conflict levels <sup>f</sup>				Family cohesion levels				Family chaos levels			
			Low (n = 284)	Middle (n = 179)	High (n = 87)	Low (n = 74)	Middle (n = 278)	High (n = 198)	Low (n = 139)	Middle (n = 265)	High (n = 146)			
Maternal dietary intake														
Fruits and vegetables (servings/week)	#	7 <sup>†</sup>	5.42 ± 2.88	4.77 ± 2.4	4.94 ± 2.9	4.17 ± 2.21 <sup>†A</sup>	4.89 ± 2.46 <sup>A</sup>	5.83 ± 3.13 <sup>B</sup>	5.77 ± 3.12 <sup>A</sup>	4.77 ± 2.56 <sup>B</sup>	5.19 ± 2.61			
100% fruit and vegetable juice (servings/week)	#	2 <sup>†</sup>	2.37 ± 2.30	1.94 ± 1.88	2.32 ± 2.07	1.98 ± 1.89 <sup>A</sup>	2.00 ± 1.98 <sup>A</sup>	2.63 ± 2.38 <sup>B</sup>	2.73 ± 2.41 <sup>A</sup>	1.94 ± 2.00 <sup>B</sup>	2.26 ± 2.03			
% total calories from fat	#	17 <sup>†</sup>	37.10 ± 5.86 <sup>A</sup>	36.90 ± 4.98 <sup>A</sup>	39.40 ± 7.30 <sup>B</sup>	37.23 ± 6.41	37.44 ± 5.50	37.40 ± 6.28	36.95 ± 5.78 <sup>A</sup>	36.79 ± 5.76 <sup>A</sup>	38.93 ± 6.05 <sup>B</sup>			
Sugar-sweetened beverages (servings/week)	#	4 <sup>†</sup>	0.85 ± 0.87	0.87 ± 0.82	1.07 ± 1.02	1.03 ± 0.84	0.84 ± 0.89	0.91 ± 0.89	0.86 ± 0.88	0.85 ± 0.81	1.00 ± 0.99			
Maternal eating behaviours														
Emotional eating <sup>a</sup>	0.75	3 (1-4)	1.82 ± 0.84 <sup>A</sup>	2.26 ± 0.82 <sup>B</sup>	2.47 ± 0.88 <sup>B</sup>	2.41 ± 0.89 <sup>A</sup>	2.11 ± 0.87 <sup>B</sup>	1.88 ± 0.84 <sup>B</sup>	1.82 ± 0.93 <sup>A</sup>	2.04 ± 0.84 <sup>B</sup>	2.36 ± 0.82 <sup>C</sup>			
Uncontrolled eating <sup>a</sup>	0.81	3 (1-4)	1.78 ± 0.74 <sup>A</sup>	2.06 ± 0.66 <sup>B</sup>	2.32 ± 0.84 <sup>C</sup>	2.24 ± 0.76 <sup>A</sup>	1.96 ± 0.71 <sup>B</sup>	1.85 ± 0.80 <sup>B</sup>	1.69 ± 0.78 <sup>A</sup>	1.92 ± 0.70 <sup>B</sup>	2.29 ± 0.74 <sup>C</sup>			
Restraint eating <sup>a</sup>	0.74	4 (1-4)	2.38 ± 0.79	2.47 ± 0.65	2.43 ± 0.73	2.34 ± 0.71	2.44 ± 0.69	2.42 ± 0.81	2.30 ± 0.83 <sup>A</sup>	2.40 ± 0.69	2.56 ± 0.71 <sup>B</sup>			
Adventurous eating <sup>a</sup>	0.72	2 (1-4)	3.26 ± 0.67 <sup>A</sup>	3.08 ± 0.65	3.00 ± 0.75 <sup>B</sup>	2.97 ± 0.71 <sup>A</sup>	3.18 ± 0.63 <sup>B</sup>	3.20 ± 0.73 <sup>B</sup>	3.38 ± 0.63 <sup>A</sup>	3.12 ± 0.68 <sup>B</sup>	3.02 ± 0.69 <sup>B</sup>			
Maternal health														
General health status <sup>b</sup>	#	1 (1-5)	3.58 ± 0.90	3.47 ± 0.81	3.39 ± 0.89	3.18 ± 0.82 <sup>A</sup>	3.45 ± 0.84 <sup>B</sup>	3.75 ± 0.87 <sup>C</sup>	3.63 ± 0.91	3.45 ± 0.86	3.53 ± 0.84			
Overweight status (BMI ≥ 25)	#	1 <sup>†</sup>	142 (50%)	92 (51%)	47 (54%)	45 (61%) <sup>A</sup>	144 (52%)	92 (46%) <sup>B</sup>	71 (51%)	139 (52%)	71 (49%)			
Child dietary intake														
100% fruit/vegetable juice (servings/week)	#	2 <sup>†</sup>	3.14 ± 2.07	2.77 ± 1.83	3.04 ± 1.98	2.80 ± 1.76	2.82 ± 1.89	3.34 ± 2.15	3.50 ± 2.28 <sup>A</sup>	2.80 ± 1.84 <sup>B</sup>	2.90 ± 1.85 <sup>B</sup>			
Sugar-sweetened beverages (servings/week)	#	4 <sup>†</sup>	0.32 ± 0.43	0.36 ± 0.46	0.43 ± 0.56	0.43 ± 0.51	0.33 ± 0.45	0.34 ± 0.48	0.31 ± 0.46 <sup>A</sup>	0.31 ± 0.41 <sup>A</sup>	0.45 ± 0.55 <sup>B</sup>			
Child eating behaviours														
Emotional eating <sup>e</sup>	0.81	2 (1-5)	1.53 ± 0.64 <sup>A</sup>	1.83 ± 0.74 <sup>B</sup>	2.13 ± 1.06 <sup>C</sup>	1.97 ± 0.90 <sup>A</sup>	1.80 ± 0.74 <sup>A</sup>	1.53 ± 0.74 <sup>B</sup>	1.46 ± 0.71 <sup>A</sup>	1.75 ± 0.66 <sup>B</sup>	1.94 ± 0.96 <sup>B</sup>			
Self-regulation eating <sup>e</sup>	0.63	2 (1-5)	2.39 ± 1.01	2.57 ± 0.87	2.59 ± 1.08	2.57 ± 1.02	2.45 ± 0.92	2.48 ± 1.05	2.31 ± 1.06 <sup>A</sup>	2.48 ± 0.92	2.64 ± 1.01 <sup>B</sup>			
Adventurous eating <sup>e</sup>	0.88	4 (1-5)	2.99 ± 1.15	3.22 ± 0.96	3.25 ± 1.08	3.38 ± 1.17 <sup>A</sup>	3.14 ± 0.97	2.97 ± 1.19 <sup>B</sup>	2.88 ± 1.20 <sup>A</sup>	3.10 ± 1.03	3.35 ± 1.03 <sup>B</sup>			
Child health														
General health status <sup>b</sup>	#	1 (1-5)	4.60 ± 0.65 <sup>A</sup>	4.47 ± 0.66 <sup>A</sup>	4.25 ± 0.82 <sup>B</sup>	4.24 ± 0.87 <sup>A</sup>	4.50 ± 0.63 <sup>B</sup>	4.61 ± 0.68 <sup>B</sup>	4.61 ± 0.68 <sup>A</sup>	4.52 ± 0.60	4.36 ± 0.83 <sup>B</sup>			
Overweight status (≥85th BMI-for-age percentile)	#	1 <sup>†</sup>	135 (48%)	68 (38%)	37 (43%)	39 (53%)	109 (39%)	92 (47%)	62 (45%)	116 (44%)	62 (42%)			
Household characteristics and food availability														
Food insecurity risk <sup>d</sup>	0.84	2 (1-4)	1.74 ± 1.88 <sup>A</sup>	2.11 ± 1.78 <sup>A</sup>	2.86 ± 2.03 <sup>B</sup>	2.72 ± 1.89 <sup>A</sup>	2.15 ± 1.91 <sup>B</sup>	1.62 ± 1.83 <sup>B</sup>	1.40 ± 1.80 <sup>A</sup>	2.03 ± 1.84 <sup>B</sup>	2.66 ± 1.94 <sup>C</sup>			

(Continues)

TABLE 1 (Continued)

Measure	#Items (possible score range)	Cronbach's $\alpha$	Family conflict levels <sup>§</sup>			Family cohesion levels			Family chaos levels		
			Low	Middle	High	Low	Middle	High	Low	Middle	High
			(n = 284)	(n = 179)	(n = 87)	(n = 74)	(n = 278)	(n = 198)	(n = 139)	(n = 265)	(n = 146)
Total # family meals <sup>c</sup> (per week)	#	3 (0–21)	14.19 ± 4.84 <sup>A</sup>	13.24 ± 5.03	12.64 ± 5.58 <sup>B</sup>	10.42 ± 5.17 <sup>A</sup>	13.68 ± 4.78 <sup>B</sup>	14.78 ± 4.88 <sup>B</sup>	14.78 ± 5.02 <sup>A</sup>	13.43 ± 5.00 <sup>B</sup>	12.92 ± 5.03 <sup>B</sup>
Fruits and vegetables (servings/person/week)	#	7 <sup>‡</sup>	10.45 ± 4.73 <sup>A</sup>	9.64 ± 4.03	8.78 ± 4.39 <sup>B</sup>	8.08 ± 4.13 <sup>A</sup>	9.41 ± 4.12 <sup>B</sup>	11.32 ± 4.74 <sup>C</sup>	11.46 ± 5.03 <sup>A</sup>	9.34 ± 4.28 <sup>B</sup>	9.51 ± 3.99 <sup>B</sup>
Salty/fatty snacks (usual servings/person/week)	#	4 <sup>‡</sup>	7.92 ± 7.48 <sup>A</sup>	8.27 ± 6.38	10.05 ± 7.81 <sup>B</sup>	8.74 ± 6.27	7.74 ± 6.47	9.12 ± 8.41	7.92 ± 7.37 <sup>A</sup>	7.83 ± 7.07 <sup>A</sup>	9.77 ± 7.23 <sup>B</sup>
Sugar-sweetened beverages (usual servings/person/week)	#	4 <sup>‡</sup>	7.23 ± 7.45	7.29 ± 6.81	8.24 ± 6.65	7.69 ± 5.58	6.44 ± 6.30 <sup>A</sup>	8.66 ± 8.43 <sup>B</sup>	7.29 ± 7.52	7.06 ± 6.96	8.15 ± 7.01
Family meal atmosphere <sup>d</sup>	0.70	2 (1–5)	4.48 ± 0.59 <sup>A</sup>	3.88 ± 0.75 <sup>B</sup>	3.41 ± 1.12 <sup>C</sup>	3.62 ± 1.06 <sup>A</sup>	4.00 ± 0.81 <sup>B</sup>	4.47 ± 0.68 <sup>C</sup>	4.71 ± 0.47 <sup>A</sup>	4.15 ± 0.74 <sup>B</sup>	3.50 ± 0.92 <sup>C</sup>

<sup>a</sup>Answer choices = 1 (definitely false), 2 (mostly false), 3 (mostly true), and 4 (definitely true).

<sup>b</sup>Answer choices = 1 (bad), 2 (fair), 3 (good), 4 (very good), and 5 (excellent).

<sup>c</sup>Answer choices = 0 (almost never), 1 (1 day a week), 2 (2 days a week), 3 (3 days a week), 4 (4 days a week), 5 (5 days a week), 6 (6 days a week), and 7 (everyday).

<sup>d</sup>Answer choices = 1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), and 5 (strongly agree).

<sup>e</sup>Cronbach's alpha for family conflict (two items), cohesion (three items), and chaos (three items) is .82, .84, .75, respectively.

<sup>f</sup>Cronbach's alpha cannot be calculated due to format of instrument or number of items (i.e., <2).

<sup>‡</sup>Possible score range 0 to no limit.

<sup>†</sup>Superscript uppercase letters followed by different uppercase letters indicate significant ( $p < .05$ ) differences between low, middle, and high groups of family conflict, cohesion, and chaos as determined by post hoc Tukey follow-up tests.

family conflict, cohesion, and chaos. Analysis of variance and Tukey post hoc procedures explored significant differences in measures by family functioning and household organization levels.

Regression analyses examined the association of cluster grouping levels on diet-related behaviours of mothers and their children. Linear regression models for continuous outcome variables and logit regression models for the discrete outcome variables were used to determine the association of cluster grouping levels of family conflict, cohesion, and chaos on diet-related behaviour measures while controlling for sociodemographic and behavioural characteristics (e.g., mother's education level, paid hours of employment/week, race/ethnicity, general health status, weight status, family affluence, household composition [single vs. dual parents, number of children <18 years of age], total number family meals/week, family meal atmosphere, food insecurity risk, and child's sex, age, weight status, and general health status). Intermediate groups clustered by family conflict, cohesion, and chaos were used as the reference group. As indicated in Tables 2–4, maternal and child eating behaviour scale scores were dichotomized to represent nonexpression of the eating behaviour versus expression of the eating behaviour. The selection of covariates in the regression models was based on theoretical considerations and previous research findings (Martin-Biggers, 2016). All analyses were conducted using Stata 13 (New Brunswick, NJ, 2016).

### 3 | RESULTS

Participating mothers ( $N = 550$ ) were the households' primary food gatekeeper and had  $2.20 \pm 1.01$ SD children under age 18 years in their households with at least one of these children being between 2 and 5 years old. Mother's average age was  $32.26 \pm 5.82$  years. Most participants were White (72%), had at least some post-secondary education (82%), had fairly high family affluence (54%), did not work outside the home (55%), and were dual parent households (88%).

Based on findings from the Calinski–Harabasz pseudo-F index, the number of optimal clusters was three for family conflict and cohesion. Although the optimal number of clusters for household chaos was two, three was used for consistency across the family functioning measures. The F index values for family conflict, cohesion, and household chaos were 777.1, 482.2, and 371.9, respectively. Approximately 16% ( $n = 87$ ) of participants had high levels of family conflict—that is, they frequently fight with and criticize each other (Table 1). On the other hand, more than half ( $n = 284$ ) had harmonious home environments and experienced lower family conflict. Over one-third of participants ( $n = 198$ ) were classified as having high family cohesion. That is, they got along well with each other, supported each other, and liked being together. More than a quarter of participants ( $n = 146$ ) reported their households as being highly disorganized and chaotic (i.e., “they cannot hear themselves think in their homes” and “they feel their home is like a zoo”).

Table 1 reports descriptive statistics and analysis of variance test results for all study measures by three cluster grouping levels for family conflict, cohesion, and chaos. In terms of dietary behaviours, mothers from highly cohesive families ate significantly ( $p < .05$ ) more servings of fruits and vegetables and 100% fruit/vegetable juice than mothers

with lower family cohesiveness. Similarly, those in low conflict families or low chaos families consumed significantly less total fat as percent calories than their more conflicted and chaotic counterparts. Children in homes with high household chaos consumed significantly greater amounts of sugar-sweetened beverages and less 100% fruit/vegetable juice servings per week than those in homes with less family chaos. Similar trends occurred in household food availability characteristics, in that, families of low conflict and chaos had significantly more fruit/vegetable and fewer salty/fatty snack servings in the household available for consumption than families of high conflict and chaos. Families with high cohesion had significantly more fruit/vegetable servings available in the home than lower cohesion families.

Mothers were significantly ( $p < .05$ ) more likely to engage in emotional and disinhibited eating in families with a high level of family conflict and chaos and a low level of family cohesion compared to their counterparts. Mothers in families with low levels of family conflict and chaos and a high level of family cohesion also were significantly more likely to be adventurous eaters than their peers. Additionally, mothers in families of low cohesion were significantly more likely to be overweight and have poorer health status than mothers in families with better family cohesion. Furthermore, families with the most conflict, least cohesion, and most chaos were significantly more likely to have more risk for food insecurity and ate significantly fewer meals together as a family each week than comparison groups.

Regression analysis determined the association of the cluster grouping levels of family conflict, family cohesion, and household chaos on diet-related behaviour measures while controlling for sociodemographic and behavioural characteristics (Table 2). All statistical associations discussed below are at the 1% and 5% level, unless noted at the 10% significance level. Family conflict, cohesion, and household chaos were not significant predictors of maternal intake of sugar-sweetened beverages. Low household chaos or high family cohesion significantly predicted greater intake of 100% fruit/vegetable juice and fruit/vegetable servings. High family cohesion was significantly associated with a higher intake of 100% fruit/vegetable juice, whereas low family cohesion predicted a lower intake of fruit/vegetable intake at the 10% significance level. Additionally, high family conflict or high household chaos significantly predicted a greater percent of total calories from fat for mothers, whereas low family cohesion predicted fewer total calories from fat for mothers. Low family conflict also was significantly associated with lower emotional eating in mothers. Interestingly, high family conflict ( $p < .05$ ) and high family cohesion ( $p < .10$ ) were significant predictors of mothers who were uncontrolled eaters. Furthermore, high household chaos level was a significant predictor of mothers who were restraint eaters, and low household chaos predicted mothers who were adventurous eaters.

Regression results for children's eating behaviours demonstrated trends similar to those of mothers' eating behaviours (Table 3). High family cohesion or low household chaos significantly predicted greater 100% fruit/vegetable juice intake by children at the 10% and 1% significance level, respectively. High household chaos predicted greater sugar-sweetened beverage intake by children at the 10% significance level. In addition, low family conflict was associated with lower emotional and non-self-regulated child eaters at the 10% and 5% significance level, respectively.

High family cohesion significantly ( $p < .10$ ) predicted more frequent family meals, whereas low family cohesion significantly ( $p < .001$ ) predicted less frequent family meals (Table 4). Additionally, high family cohesion significantly predicted greater household availability of fruits/vegetables and sugar-sweetened beverages at the 1% significance level and greater household availability of salty/fatty snacks at the 10% significance level. Low household chaos was a significant predictor of greater household availability of fruits/vegetables and more family meals together. In contrast, high household chaos significantly predicted more household availability of salty/fatty snacks.

## 4 | DISCUSSION

Overall, findings from this study indicate that positive home environments (i.e., low family conflict, high family cohesion, and low household chaos) were associated with healthier food-related behaviours. In contrast, negative home environments (i.e., high family conflict, low family cohesion, and high household chaos) were associated with unhealthy food-related behaviours even after controlling for sociodemographic and related behavioural factors. These findings

extend previous documented observations regarding the importance of environments, particularly household environments and family functioning, on dietary behaviours and body weight (Halliday et al., 2014; Renzaho et al., 2014; Smith et al., 2015). Thus, findings suggest that family-based health and nutrition interventions for households with young children may want to consider addressing general family functioning and household management skills or, at the very least, control for these differences when examining intervention outcomes; however, longitudinal research studies are needed to confirm our study findings.

In the household environment, family functioning is an important factor in the regulation of young children's eating behaviours, especially for the parent or guardian who is the family food gatekeeper and role model for healthy eating behaviours (Wen et al., 2011). Research has found that higher levels of household chaos and lower levels of family functioning is related to poorer parent dysfunctional discipline practices (Dumas et al., 2005) and poorer family eating habits (Renzaho et al., 2014). Concomitantly, our study reported similar findings in that high household chaos was associated with less healthy food-related behaviours in children (i.e., greater sugar-sweetened beverage intake), whereas low household chaos was linked with healthier behaviours (i.e., greater 100% fruit/vegetable juice intake).

**TABLE 2** Coefficient estimates from regression analyses examining associations of mother's eating behaviours with family conflict, cohesion, and chaos ( $N = 550$ )

Independent variable	Dependent variables <sup>†</sup>							
	Sugar-sweetened beverages (servings/week)	100% fruit and vegetable juice (servings/week)	Fruits and vegetables (servings/week)	% Total calories from fat	Emotional eater <sup>§</sup>	Uncontrolled eater <sup>§</sup>	Restraint eater <sup>§</sup>	Adventurous eater <sup>¶</sup>
	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]
Low family conflict	-0.05 (0.09) [-0.24, 0.13]	-0.01 (0.22) [-0.44, 0.41]	0.07 (0.28) [-0.47, 0.61]	0.47 (0.63) [-0.76, 1.70]	-0.72** (0.28) [-1.27, -0.17]	-0.39 (0.35) [-1.08, 0.29]	-0.00 (0.25) [-0.49, 0.48]	0.38 (0.23) [-0.08, 0.84]
High family conflict	0.12 (0.13) [-0.12, 0.37]	0.20 (0.29) [-0.37, 0.76]	0.16 (0.37) [-0.57, 0.88]	2.21*** (0.83) [0.58, 3.85]	0.40 (0.33) [-0.24, 1.04]	0.85** (0.38) [0.10, 1.60]	-0.12 (0.34) [-0.79, 0.54]	0.25 (0.32) [-0.37, 0.87]
Low family cohesion	0.02 (0.13) [-0.23, 0.27]	-0.13 (0.29) [-0.70, 0.44]	-0.69* (0.37) [-1.42, 0.04]	-1.91** (0.84) [-3.56, -0.26]	0.39 (0.33) [-0.27, 1.05]	0.13 (0.40) [-0.65, 0.91]	-0.56 (0.36) [-1.26, 0.15]	-0.40 (0.33) [-1.04, 0.25]
High family cohesion	0.12 (0.09) [-0.06, 0.29]	0.36* (0.20) [-0.04, 0.76]	0.58** (0.26) [0.06, 1.09]	0.19 (0.59) [-0.97, 1.35]	-0.13 (0.28) [-0.68, 0.42]	0.58* (0.33) [-0.06, 1.23]	0.06 (0.23) [-0.40, 0.51]	-0.17 (0.22) [-0.60, 0.26]
Low household chaos	0.04 (0.10) [-0.15, 0.24]	0.62*** (0.23) [0.18, 1.07]	0.72*** (0.29) [0.15, 1.29]	0.10 (0.65) [-1.19, 1.38]	0.18 (0.31) [-0.44, 0.79]	-0.42 (0.39) [-1.18, 0.34]	0.10 (0.26) [-0.41, 0.60]	0.72*** (0.24) [0.25, 1.19]
High household chaos	0.10 (0.10) [-0.09, 0.29]	0.22 (0.22) [-0.22, 0.66]	0.30 (0.29) [-0.26, 0.87]	1.37** (0.65) [0.10, 2.65]	0.44 (0.28) [-0.11, 0.98]	0.53 (0.33) [-0.11, 1.18]	0.58** (0.25) [0.08, 1.07]	-0.28 (0.25) [-0.77, 0.20]
$R^2$ (pseudo $R^2$ )	0.085	0.184	0.193	0.105	0.129	0.111	0.065	0.058

Note. For the regression of each outcome variable, the intermediate group for family conflict, cohesion, and chaos is used as a reference group. To avoid perfect collinearity, the dummy variables for the intermediate group are excluded in the regression.

Linear regression analysis was performed in all models, except for Emotional Eater, Uncontrolled Eater, Restraint Eater, and Adventurous Eater variables where logit regression analyses were performed.

<sup>†</sup>Models include family conflict, cohesion, chaos, and the following covariates: mother's education level, paid hours of employment/week, race/ethnicity, general health status, weight status, family affluence, household composition (single vs. dual parents, number of children <18 years in household), total number family meals/week, family meal atmosphere, and food insecurity risk.

<sup>§</sup>Variable scores were dichotomized to represent two groups (0 and 1) in the regression. Scores representing nonexpression of the characteristic were coded as 0 (score < 3) or coded as 1 (score  $\geq$  3) to represent expression of the characteristic.

<sup>¶</sup>Variable score was dichotomized to represent two groups (0 and 1) in the regression. Scores representing nonexpression of the characteristic were coded as 0 (score  $\leq$  3) or coded as 1 (score > 3) to represent expression of the characteristic.

\* $p < .10$

\*\* $p < .05$ ,

\*\*\* $p < .01$ .

It is conceivable that chaotic households, characterized by disorganization and less stability and order, may negatively influence parents' abilities to plan, such as organizing a grocery list that includes purchasing healthier foods (e.g., more fruits/vegetables and less salty/fatty snacks) for their family, and planning family meals. Household chaos is also known to exacerbate family stress and diminish the level of supportive parenting provided to children (Nelson, O'Brien, Blankson, Calkins, & Keane, 2009). For example, Valiente, Lemery-Chaflant, and Reiser (2007) examined the relation between perceptions of household chaos and parental response to children's negative emotions and reported that high levels of chaos were linked with low levels of supportive responses (Valiente, Lemery-Chaflant, & Reiser, 2007). Epidemiological evidence and systematic reviews also suggest that parent-child relationships, including emotional bonds and maternal sensitivity to children's needs, play an important role in child eating and weight status (Anderson & Keim, 2016; Blewitt, Bergmeier, Macdonald, Olsson, & Skouteris, 2016; Skouteris et al., 2012). Additionally, household chaos may exacerbate negative parenting behaviours and further reduce parent responsiveness and lower parenting self-efficacy (Coldwell et al., 2006; Dumas et al., 2005; Martin, Razza, & Brooks-Gunn, 2012). Examining the association of household chaos level with parents' behaviours in regulating children's food intake (e.g., food rewards and covert control) and

parent-child relationships was beyond the scope of this study but should be considered in future research.

Similar to previous work (Welsh, French, & Wall, 2011), this study found that family meal frequency was positively associated with higher family cohesion but was inconsistently related to dietary intake behaviours of mothers and their child. Other mediators of the relationship between family meal frequency and dietary intake, such as value parents place on being a positive role model to children for dietary behaviours and types/quantities of food offered during meals, may contribute to the inconsistent findings and thus should be explored in future research. Interestingly, families in households with high levels of cohesiveness had significantly greater household availability of fruits/vegetables as well as salty/fatty snacks and sugar-sweetened beverages, even after controlling for food insecurity risk and SES. Although previous studies report that unhealthy eating behaviours tend to decrease as household income rises, the amount of takeaway foods eaten (generally considered a less healthy eating behaviour) is positively correlated with income (Renzaho et al., 2014). The relationship between household income and consumption of takeaway foods may be related to greater work commitments among parents with higher paying jobs (French, Story, Neumark-Sztainer, Fulkerson, & Hannan, 2001). Thus, nutrition interventions and programmes need to educate parents on ways that their family can

**TABLE 3** Coefficient estimates from regression analyses examining associations of children's eating behaviours with family conflict, cohesion, and chaos ( $N = 548^{\dagger}$ )

Independent variable	Dependent variables <sup>‡</sup>				
	Sugar-sweetened beverages (servings/week)	100% fruit and vegetable juice (servings/week)	Emotional eater <sup>§</sup>	Non-self-regulated eater <sup>§</sup>	Adventurous eater <sup>¥</sup>
	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]
Low family conflict	-0.05 (0.05) [-0.14, 0.05]	-0.04 (0.21) [-0.45, 0.36]	-0.68* (0.41) [-1.49, 0.13]	-0.58** (0.24) [-1.04, -0.11]	-0.15 (0.23) [-0.59, 0.29]
High family conflict	-0.01 (0.07) [-0.14, 0.12]	0.21 (0.28) [-0.33, 0.75]	0.85** (0.40) [0.07, 1.62]	-0.26 (0.31) [-0.87, 0.34]	-0.11 (0.30) [-0.70, 0.49]
Low family cohesion	0.01 (0.07) [-0.12, 0.14]	-0.32 (0.28) [-0.87, 0.24]	-0.19 (0.43) [-1.03, 0.65]	-0.15 (0.32) [-0.77, 0.48]	-0.11 (0.31) [-0.71, 0.50]
High family cohesion	0.04 (0.05) [-0.06, 0.13]	0.32* (0.19) [-0.06, 0.71]	-0.03 (0.39) [-0.79, 0.73]	0.26 (0.22) [-0.18, 0.70]	-0.14 (0.21) [-0.56, 0.27]
Low household chaos	0.03 (0.05) [-0.08, 0.13]	0.58*** (0.22) [0.16, 1.01]	0.47 (0.43) [-0.37, 1.30]	0.25 (0.25) [-0.24, 0.73]	-0.32 (0.24) [-0.79, 0.14]
High household chaos	0.10* (0.05) [-0.00, 0.20]	0.13 (0.22) [-0.30, 0.55]	-0.02 (0.39) [-0.77, 0.74]	0.33 (0.24) [-0.14, 0.80]	0.19 (0.24) [-0.28, 0.65]
$R^2$ (pseudo $R^2$ )	0.117	0.132	0.144	0.057	0.042

Note. For the regression of each outcome variable, the intermediate group for family conflict, cohesion, and chaos is used as a reference group. To avoid perfect collinearity, the dummy variables for the intermediate group are excluded in the regression. Linear regression analysis was performed in all models, except for Emotional Eater, Non-Self-Regulated Eater, and Adventurous Eater variables where logit regression analyses were performed.

<sup>†</sup>Participants excluded from analyses due to missing child height and weight data ( $n = 2$ ).

<sup>‡</sup>Models include family conflict, cohesion, chaos, and the following covariates: mother's education level, paid hours of employment/week, race/ethnicity, general health status, weight status, family affluence, household composition (single vs. dual parents, number of children <18 years in household), total number family meals/week, family meal atmosphere, food insecurity risk, and child's sex, age, weight status, and general health status.

<sup>§</sup>Variable scores were dichotomized to represent two groups (0 and 1) in the regression. Scores representing nonexpression of the characteristic were coded as 0 (score < 3) or coded as 1 (score  $\geq$  3) to represent expression of the characteristic.

<sup>¥</sup>Variable score was dichotomized to represent two groups (0 and 1) in the regression. Scores representing nonexpression of the characteristic were coded as 0 (score  $\leq$  3) or coded as 1 (score > 3) to represent expression of the characteristic.

\* $p < .10$ ,

\*\* $p < .05$ ,

\*\*\* $p < .01$ .



**TABLE 4** Coefficient estimates from regression analyses examining associations of family meals and household food availability with family conflict, cohesion, and chaos ( $N = 548^{\dagger}$ )

Independent variable	Dependent variables <sup>‡</sup>			
	Total # of family meals (per week)	Household fruits and vegetables (servings/person/week)	Household salty, fatty snacks (servings/person/week)	Household sugar-sweetened beverages (servings/person/week)
	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]	$\beta$ (SE), [95% CI]
Low family conflict	-0.15 (0.53) [-1.20, 0.90]	-0.37 (0.45) [-1.26, 0.52]	-0.63 (0.77) [-2.13, 0.88]	-1.14 (0.76) [-2.64, 0.36]
High family conflict	1.15 (0.71) [-0.24, 2.54]	-0.21 (0.60) [-1.40, 0.97]	0.74 (1.02) [-1.26, 2.73]	0.45 (1.01) [-1.54, 2.44]
Low family cohesion	-3.38*** (0.71) [-4.78, -1.99]	-1.07** (0.62) [-2.28, 0.14]	-0.48 (1.04) [-2.52, 1.56]	-0.05 (1.04) [-2.08, 1.99]
High family cohesion	0.87* (0.50) [-0.12, 1.85]	1.27*** (0.43) [0.43, 2.11]	1.38* (0.72) [-0.04, 2.79]	2.48*** (0.72) [1.06, 3.89]
Low household chaos	1.15** (0.55) [0.06, 2.24]	1.50*** (0.47) [0.57, 2.43]	-0.28 (0.80) [-1.85, 1.29]	-0.22 (0.80) [-1.78, 1.35]
High household chaos	-0.12 (0.55) [-1.21, 0.97]	0.30 (0.47) [-0.63, 1.22]	1.61* (0.79) [0.05, 3.17]	0.90 (0.79) [-0.65, 2.46]
$R^2$ (pseudo $R^2$ )	0.129	0.197	0.121	0.092

Note. For the regression of each outcome variable, the intermediate group for family conflict, cohesion, and chaos is used as a reference group. To avoid perfect collinearity, the dummy variables for the intermediate group are excluded in the regression. Linear regression analysis was performed for all models.

<sup>†</sup>Participants excluded from analyses due to missing child height and weight data ( $n = 2$ ).

<sup>‡</sup>Models include family conflict, cohesion, chaos, and the following covariates: mother's education level, paid hours of employment/week, race/ethnicity, general health status, weight status, family affluence, household composition (single vs. dual parents, number of children <18 years in household), total number family meals/week, family meal atmosphere, food insecurity risk, and child's sex, age, weight status, and general health status.

\* $p < .10$ ,

\*\* $p < .05$ ,

\*\*\* $p < .01$ .

eat healthy meals together while taking into consideration work time constraints and financial stressors.

In this study, mothers and their children with less family conflict were less likely to engage in emotional, uncontrolled (mother), and non-self-regulation (child) eating behaviours, whereas mothers with high family conflict were likely to be uncontrolled eaters. Surprisingly, mothers with high family cohesion tended to report a greater propensity towards uncontrolled eating behaviours; however, this was only significant at  $p < .10$  and may be a spurious finding. Prior research findings, though, indicate that family cohesion is unrelated to eating behaviours in women possibly because powerful cultural factors (e.g., dieting and body image) influence their eating and weight behaviours, and these may interact with family cohesiveness (Johnson et al., 1997). In these same regression models (data are not shown), high food insecurity risk significantly predicted emotional, uncontrolled, and restraint eating mothers and significantly predicted emotional eating in children. Food insecure families tend to struggle with purchasing and eating meals consistently, which may contribute to unhealthy eating behaviours and family conflict (Evans, 2004). The additional stressors and increased cognitive load associated with food insecurity risk adds additional challenges for these families to make healthy food and behaviour decisions (Wong et al., 2016). That being said, nutrition educators need to be cognizant of family situations to more accurately evaluate and prescribe tailored, family-based interventions conducive to improving food-related behaviours that also could reshape home environments to be more supportive of optimal health.

This is one of few studies that have examined how food-related behaviours differ in mothers and their preschool children by level of

family functioning (cohesion, conflict) and household disorganization (chaos) in a relatively large sample using psychometrically sound instruments. The reported regression analyses also controlled for many confounding factors, such as parent household structure, family affluence, food insecurity risk, parent education, and race/ethnicity. However, findings should be interpreted in the light of study limitations. The cross-sectional study design does not allow for inference of causality of the observed associations. Additionally, the study sample only included mothers of preschool-aged children who had demographics similar to the United States, so findings may not be generalizable to fathers or families with children of different ages and in other countries. Given the multiple tests, there is a chance that some significant associations may have occurred due to chance. Lastly, all information from participants was self-reported including mothers reporting to similar questions on dietary intake (e.g., fruit/vegetable and sugar-sweetened beverage servings) for their child and household and, thus, may be subject to both reporting error and bias.

Notwithstanding these limitations, the reported findings make an important contribution to the field. Our findings suggest that families with high family functioning (i.e., low conflict/high cohesion) and low household chaos have healthier household environments supportive of positive food-related behaviours. Thus, family-based nutrition and lifestyle interventions may benefit from focusing on assisting the family in shaping healthier home food environments and, furthermore, need to include consideration of the psychological aspects of the family that affect family life and health choices, specifically how to build family cohesiveness and reduce household chaos. Additionally, interventions should consider addressing family dysfunction and offer

support and coping strategies for parents with psychological stressors (Anderson & Keim, 2016; Skouteris et al., 2012).

## CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

## CONTRIBUTIONS

JMB and CBB designed the study and contributed to the development and implementation of the study. MZ and YJ were involved with the analysis and interpretation of the data with the assistance from VQ and CBB. VQ and CBB drafted the manuscript, and all authors contributed to editing and reviewing of the final manuscript. All authors have read and approved the final manuscript.

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