

# Maternal eating behaviour differs between ethnic groups: Considerations for research and practice

Murhaf Korani | David M. Rea | Pete F. King | Amy E. Brown 

Department of Public Health, Policy and Social Sciences, Swansea University, Swansea, UK

## Correspondence

Dr. Amy Brown, Department of Public Health, Policy and Social Sciences, Swansea University, Swansea SA2 8PP, UK.  
Email: a.e.brown@swansea.ac.uk

## Funding information

The research was funded by a fellowship to MK from Umm Al-Qura University, Saudi Arabia; Umm Al-Qura University, Saudi Arabia

## Abstract

Maternal eating behaviours such as cognitive restraint, uncontrolled, and emotional eating styles can have important implications for both maternal own weight, and the weight and eating behaviour of her children. Maternal eating style can affect her feeding interactions with her child, which in turn can influence their weight and eating behaviour. However, despite a body of research examining these relationships, research examining differences in maternal eating behaviour between ethnic groups is sparse with much of the research, particularly in the UK, conducted with White British samples. The aim of the current research was therefore to explore how maternal eating behaviour may differ between ethnic groups in the UK; 659 UK mothers with a child aged 5–11 years completed a self-report questionnaire. Items included ethnicity, demographic data, and the 3-factor eating questionnaire to measure maternal cognitive restraint, uncontrolled, and emotional eating. Mothers from Chinese backgrounds were significantly higher in cognitive restraint and lower in emotional and uncontrolled eating compared with all groups. Conversely, mothers from South Asian backgrounds were the highest in emotional and uncontrolled eating and lower in cognitive restraint than all other groups. Black mothers were also higher in uncontrolled eating compared with White British and Chinese mothers. Variations in maternal eating behaviours vary between ethnic groups. Understanding how cultural factors may influence these variations is important, as maternal eating behaviours can influence her own and her child's weight. Maternal eating behaviour may therefore be a contributor to higher levels of overweight among South Asian and Black children living in the UK.

## KEYWORDS

Chinese, cognitive restraint, emotional eating, ethnicity, maternal eating behaviour, south Asian, uncontrolled eating

## 1 | BACKGROUND

The variability and influence of maternal eating behaviour are a growing field of research. Maternal eating behaviour, and the perceptions that go with it, can influence both her and her children's weight (Ventura & Birch, 2008). Understanding influences on how and why mothers eat, especially in the absence of hunger, is therefore important for supporting and protecting wider family health. However, in the UK, there is a dearth of maternal eating behaviour research that

is diverse in its sampling, or compares outcomes, between ethnic groups. This is a gap for both research and practice, which needs to be explored to ensure that research is accurate, generalizable, and culturally sensitive for all.

Humans eat for many reasons, many of which are not related to simple hunger (Ogden, 2011). Eating behaviour is typically measured along three broad aspects: how restrained an individual is, for example, dieting, restricting intake of food; how uncontrolled they are, for example, eating in response to smelling or seeing food; and finally,

whether they eat for emotional reasons, for example, eating in response to sadness, boredom, or happiness (Stunkard & Messick, 1985). Eating for reasons not associated with hunger or trying to restrict intake of food can affect weight and therefore physical and emotional health (Wyatt, Winters, & Dubbert, 2006), but understanding the link between eating and weight is not always straightforward.

In terms of restrained eating, individuals who are overweight are more likely to report they are high in constraint (Johnson & Wardle, 2005). However, they often become stuck in a cycle where too much restraint leads to uncontrolled eating, and thus more weight gain (Woods, Racine, & Klump, 2010). Emotional eating is also associated with an increased risk of overweight due to an excess intake of calories (Snoek, Van Strien, Janssens, & Engels, 2007). Eating in response to emotional reactions can lead to eating in the absence of hunger, and thus overweight (Macht, 2008).

Maternal eating behaviour is also associated with her feeding attitudes and interactions with her child. Mothers who are high in restraint are more likely to restrict their child's intake of food (Rodgers et al., 2013), often out of a belief that they will protect their child from becoming overweight like themselves (Benton, 2004). Unfortunately, this can often have the opposite effect. Although not all research is conclusive, mothers who use high levels of controlling feeding practices with their child are more likely to have a child who is overweight, because restricting a food increases desire (Clark, Goyder, Bissell, Blank, & Peters, 2007; Shloim, Edelson, Martin, & Hetherington, 2015; Webber, Hill, Cooke, Carnell, & Wardle, 2010). Children whose mother is high in restriction are therefore more likely to eat in the absence of hunger when given free access to restricted foods (Kral & Rauh, 2010), thus being at greater risk of overweight (Faith & Kerns, 2005).

Mothers who are emotional eaters are more likely to use emotional feeding styles with their children, giving food in response to their child's emotions (Wardle, Sanderson, Guthrie, Rapoport, & Plomin, 2002). Mothers apply the same logic that they use to eat to their children, for example, trying to deal with sadness through eating palatable foods (Tan & Holub, 2015). Children of mothers who are high in emotional eaters are more likely to emotionally eat themselves (Lauzon-Guillain et al., 2009) and also are more likely to be overweight, due to an excess intake of energy (Hajna, Leblanc, & Faught, 2014).

Understanding factors that are associated with eating behaviour is important in supporting individuals to adopt healthier eating patterns. Factors such as body image (Tiggemann & Lynch, 2001) and cultural pressure (Braun, Park, & Gorin, 2016) are well documented in affecting maternal restraint (and often uncontrolled eating).

Stress is also associated with both uncontrolled eating (particularly in those high in restraint) and emotional eating (Zellner et al., 2006).

Variations have been associated with demographic background. For example, individuals on a lower income are more likely to be high in emotional eating (Reagan & Hersch, 2005). However, although research has examined how differences in body image differ broadly between ethnic groups, with South Asian (Cachelin, Rebeck, Chung, & Pelayo, 2002) and African American (Wardle & Marsland, 1990) women typically having more positive body images than White American women, evidence is sparse in considering how ethnicity

### Key messages

- Maternal eating behaviour differs between ethnic groups in the UK, and therefore, eating behaviour research should routinely collect ethnicity data and ensure diversity in samples.
- Mothers from South Asian backgrounds have significantly higher levels of emotional eating and lower levels of restrained eating than Chinese, White British, and Black Afro Caribbean groups. The opposite pattern is seen for Chinese mothers.
- Public health interventions aiming to improve weight and eating behaviour should ensure that they are culturally relevant for different ethnic groups.

may affect eating behaviour. The aim of the current study was therefore to explore how maternal eating behaviour may differ between the largest ethnic groups in the UK: White British, South Asian, Black, and Chinese.

## 2 | METHOD

### 2.1 | Participants

Ethical approval was granted by a University research ethics committee, and all participants gave informed consent before involving in the study research. All aspects of the Declaration of Helsinki were followed.

Participants included mothers living in the UK with at least one child aged 5–11, which encompassed primary school age children. Exclusion criteria included identification in an ethnic group outside of the four large groups chosen for the study (White British, South Asian, Chinese, and Black), and also maternal inability to consent, maternal age younger than 18 years, and significant child health issues that would impact on feeding interactions.

### 2.2 | Measures

Participants completed a questionnaire, which collected demographic background (maternal age, education, occupation, and household income), ethnicity data, and the Three Factor Eating Questionnaire (TFEQ-R18; Karlsson, Persson, Sjöström, & Sullivan, 2000).

Ethnicity data were collected via tick box using the ethnic classifications specified in the UK census 2011 (White British, Gypsy/traveller/Irish traveller/Asian or Asian British [Indian, Pakistani, Bangladeshi, Chinese, other], Black or Black British, and other; ONS, 2011). A number of further questions identified degree of acculturation. Mothers identified whether they were born in the UK [yes/no], the number of years they had lived in the UK, and the language they spoke at home [English/mixed/home language, e.g., Urdu]. In order to examine diversity of home neighbourhood, participants also gave postcode, which was used to extract neighbourhood level data regarding the percentage of the local population who were White British (NSPL,

2011). Neighbourhood deprivation data were also extracted using this database.

To measure eating behaviour mothers completed all three scales of the TFEQ-R18 were completed. The TFEQ-R18 is a revised, shorter version of the original longer TFEQ (Stunkard & Messick, 1985) and was designed to enhance validity of the scales (De Lauzon, Romon, Deschamps, Lafay, & Borys, 2004). It consists of 18 items, which are scored to give three factors of cognitive restraint (six items), uncontrolled eating (nine items), and emotional eating (three items; Stunkard & Messick, 1985).

The TFEQ is a widely used measure of eating behaviour that shows good internal consistency and prediction of weight for both normal and obese individuals. It has been translated and used within diverse samples, although typically to assess college student or general population behaviour (e.g., Quick & Byrd-Bredbenner, 2014; Dodd, Long, Boswell, & Rogers, 2016; Chong et al., 2016; Chearskul, Pummoung, Vongsaiyat, Janyachailert, & Phattharayuttawat, 2010; Löffler et al., 2015).

### 2.3 | Procedure

A primary aim of the research was to ensure as diverse a sample as possible. Therefore, data collection was concentrated on increasing participation of non-White mothers. Study information highlighted this need, emphasizing the importance of conducting research with diverse groups that would have greater generalisability.

The questionnaire was hosted online with SurveyMonkey, although paper copies were available upon request (although no participant requested a paper copy). Adverts for the data were circulated firstly via online parenting forums (specifically those who have dedicated research request boards), via paper posters in local community and religious centres in South Wales (particularly those with diverse membership) and via schools based in regions in the UK with high levels of diversity (including, e.g., Birmingham, Leicester, Leeds, Bradford, and London). Social media was also used to share the advert. In all cases, the relevant gatekeeper was approached for permission, for example, the forum or social media group moderator, community centre staff, and for schools the head teacher who then circulated information via school newsletter. The aim was to over sample those in ethnic minority groups as a proportion of the sample compared with population statistics in order to enable statistical comparison.

In all cases, study information directed the potential participant to online information about the study. Participants could read full study background information and only if they agreed with consent questions would the full questionnaire load. Researcher details were available to request further information or a paper copy of the questionnaire. At the end of the questionnaire, a debrief was loaded with information about the study and repeated details of how to contact the researcher if required.

### 2.4 | Data Analysis

Data were analysed using IBM SPSS statistics (version 22.0). Ethnic groups were classified according to UK census (Office of National Statistics, 2011). Four major groups were identified includes; White

British, South Asian, Black, and Chinese. Those identifying as mixed or other ( $n = 11$ ) were excluded from the analysis to allow comparison of the four larger groups.

The TFEQ was scored according to instructions to give the factors of cognitive restraint, uncontrolled eating, and emotional eating. The three eating behaviour factors were tested for normality using the Kolmogorov–Smirnov test and found to be normally distributed.

The association between maternal demographic factors and ethnicity was examined using chi square, Pearson's correlations, and multivariate analysis of variance (MANOVA), and significant associations used as covariates in further analyses. Multivariate analysis of covariance was then used to explore differences in the TFEQ between ethnic groups, using covariates identified in the results. Post hoc Bonferonni tests were used to explore significant differences between groups.

Finally, the association between acculturation factors and eating behaviour was examined;  $t$  tests were used to explore differences in the TFEQ scores between mothers born in the UK or not. MANOVA was used to examine differences in TFEQ scores between home language group. For those not born in the UK, Pearson's correlations were used to explore the association between the length of time lived in the UK and maternal eating style. For the sample as a whole, Pearson's correlations used to explore associations neighbourhood diversity, neighbourhood deprivation, and eating behaviour.

## 3 | RESULTS

Six hundred and 59 responses were included in the sample. The mean age of respondents was 35.74 ( $SD: 6.17$ ), with a range from 23 to 54 years old. Three hundred and 90 (59.2%) were White British, 145 (22.0%) South Asian, 84 (12.7%) Chinese, and 40 (8.1%) Black or Black British. Further, details of the sample are shown in Table 1.

### 3.1 | Ethnicity and demographic background

A number of demographic factors were related to ethnicity (see Table 1 for breakdown between groups). A significant difference in family size was found between ethnic groups,  $F(3, 655) = 15.353$ ,  $p \leq .001$ , whereas significant associations were found between ethnic group and household income group ( $\chi^2 = 64.09$ ,  $p \leq .001$ ), education ( $\chi^2 = 60.55$ ,  $p \leq .001$ ), maternal employment ( $\chi^2 = 84.05$ ,  $p \leq .001$ ), and occupation ( $\chi^2 = 62.822$ ,  $p \leq .001$ ). Mothers from South Asian and Black backgrounds had more children and lower education than White British and Chinese mothers. Mothers from White and Black backgrounds were more likely to be employed, and mothers from White background were more likely to have a professional or managerial occupation. Mothers from White and Chinese backgrounds had higher incomes than those in Black and South Asian. No significant association was found for area diversity or deprivation between ethnic groups. Further analyses therefore controlled for household income, occupation, employment, family size, and education.

However, no significant relationships were found between maternal demographic background and maternal eating behaviour, apart from

**TABLE 1** Participant demographic background

Demographic	Group	Whole		White		South Asian		Chinese		Black	
		N	%	N	%	N	%	N	%	N	%
Education	GCSE	72	10.9	35	9.0	21	14.5	7	8.3	9	10.9
	A level	131	19.9	66	16.9	25	17.2	22	26.2	18	45
	Degree	227	34.4	138	35.4	52	35.9	30	35.7	7	17.5
	Vocational	90	13.7	45	11.5	26	17.9	19	22.6	0	0
	Postgrad	138	20.9	106	27.2	21	14.5	6	7.1	6	15.0
Marital status	Married	397	60.2	214	54.9	95	65.5	62	73.8	26	65.0
	Cohabiting	149	22.6	96	24.6	29	20.0	12	14.3	12	30.0
	Partner	39	5.9	25	6.4	11	7.6	3	3.6	0	0
	Single	65	10.6	49	12.6	8	5.5	7	8.3	1	2.5
	Divorced	9	0.5	6	1.5	2	1.4	0	0	1	2.5
Employment	Full time	321	48.8	66	45.5	26	31.0	28	70.0	66	45.5
	Part time	229	34.7	57	39.3	22	26.2	9	22.5	57	39.3
	None	109	16.5	22	15.2	36	42.9	3	7.5	22	15.2
Occupation	Higher professional/managerial	152	21.5	106	27.1	26	17.9	11	13.0	9	22.5
	Lower professional/managerial	183	28.7	126	32.3	29	20.0	20	23.8	8	20.0
	Skilled	145	20.2	88	22.6	39	26.8	8	9.5	10	25.0
	Routine occupations	90	11.2	42	10.8	29	20.0	9	10.7	10	25.0
	Unemployed/stay at home	89	2.7	28	7.1	22	15.2	36	42.9	3	7.5
Household income group	Less than £1000	27	4.1	16	4.5	8	5.7	1	1.2	2	5.1
	£1001-1700	76	11.5	31	8.7	24	17.0	15	18.5	17	43.6
	£1701-2700	156	23.7	82	23.1	46	32.6	10	12.3	2	5.1
	£2701-4200	202	30.7	128	36.1	32	22.7	31	38.3	15	38.5
	£4201	176	26.7	98	27.6	31	22	24	29.6	3	7.7
	Rather not say	22	3.3	13	0.59	5	0.22	2	0.09	2	0.09

Note. GCSE = General Certificate of Secondary Education.

a significant positive correlation between degree of neighbourhood deprivation and uncontrolled eating (Pearson's =  $-.112$ ,  $p = .005$ ).

### 3.2 | Differences in maternal eating behaviour between ethnic groups

Differences in each of the three eating behaviour factors between ethnic groups were then examined (Table 2). Significant differences between ethnic groups were found for all three eating behaviour factors. Post hoc Bonferroni tests showed that for cognitive restraint, Chinese mothers were significantly higher in restraint than both south Asian ( $p = .010$ ) and Black ( $p = .022$ ) mothers. White British mothers were significantly higher than south Asian ( $p = .007$ ) and Black ( $p = .045$ ) mothers. No further significant differences were found.

For uncontrolled eating, Chinese mothers were significantly lower in uncontrolled eating than the White British ( $p \leq .001$ ), South Asian ( $p = .003$ ), and Black ( $p = .020$ ) mothers. No further significant differences were found.

For emotional eating, the Chinese group was significantly lower in emotional eating than the White British ( $p = .013$ ), South Asian ( $p \leq .001$ ), and Black ( $p = .004$ ) mothers. White mothers were significantly lower than both South Asian ( $p = .043$ ) and Black mothers ( $p = .041$ ).

### 3.3 | Does acculturation affect eating behaviour?

The longer an individual lived in the UK, the significantly lower their uncontrolled (Pearson's =  $.296$ ,  $p \leq .001$ ) and emotional eating (Pearson's =  $.242$ ,  $p = .015$ ). No further significant associations were found.

A MANOVA was used to explore the difference in maternal eating style between those who spoke English alone at home, a mixture of English and another language at home, and those who spoke a non-English language only at home. No significant differences were found.

No significant associations were found between maternal eating behaviour and the percentage of neighbourhood population that was White.

## 4 | DISCUSSION

The aim of this study was to explore how maternal eating behaviour might differ between ethnic groups in the UK. Although research has explored maternal eating behaviour and its influence upon child eating behaviour and weight, research in the UK is often conducted predominantly with White British samples with sparse research examining how behaviours might differ between ethnic groups. The results showed that eating behaviour did vary between ethnic groups, and as the first study of its type to examine this concept in

**TABLE 2** Differences in maternal eating behaviour between ethnic groups (showing means and standard deviations)

	White British	South Asian	Chinese	Black	Significance without covariates	Significance with covariates
Cognitive restraint	2.48 (.44)	2.31 (.65)	2.49 (.46)	2.24 (.45)	$F(3, 655) = 6.381$ , $p \leq .001$	$F(3, 595) = 5.068$ , $p = .002$
Uncontrolled eating	2.69 (.63)	2.67 (.66)	2.30 (.74)	2.72 (.69)	$F(3, 655) = 6.322$ , $p \leq .001$	$F(3, 595) = 4.578$ , $p = .004$
Emotional eating	2.46 (.76)	2.64 (.85)	2.16 (.81)	2.67 (.64)	$F(3, 655) = 6.836$ , $p \leq .001$	$F(3, 595) = 6.714$ , $p \leq .001$

the UK, further research is needed to understand the associations that have emerged and how they might be relevant to those supporting families in practice.

Overall, Chinese mothers were considerably higher in cognitive restraint than other groups whereas South Asian and Black mothers had the highest scores for both emotional eating. Conversely, levels of emotional and uncontrolled eating were lowest among Chinese mothers, whereas South Asian and Black mothers had the lowest levels of cognitive restraint. Maternal eating behaviour was also associated with degree of acculturation; the longer a mother had lived in the UK, the higher their uncontrolled and emotional eating behaviour. Potentially South Asian and Black mothers—who were the highest in emotional eating (with a nonsignificant trend in the means also showing higher uncontrolled eating)—start to adapt to the higher levels of restraint present in the UK, associated with higher levels of body image dissatisfaction among White British women. In turn that may cause an increase in uncontrolled eating. In Australia, the longer female immigrants lived in Australia, the more their eating behaviour matched typical Western values of dieting and dissatisfaction (Ball & Kenardy, 2002). Potentially, however, something about their experience is increasing their risk of emotional eating.

South Asian and Black mothers had higher levels of Emotional eating. Although emotional eating is tied to body weight due to an excess intake of calories (Snoek et al., 2007), it is not a direct attempt to gain weight, instead caused by a reaction to external events (Macht, 2008). Understanding why mothers from South Asian and Black backgrounds are at an increased risk of emotional eating is therefore important. Emotional and binge eating is associated with financial difficulties, most likely as a coping mechanism (Koupil, Tooth, Heshmati, & Mishra, 2016; Reagan & Hersch, 2005), and mothers from South Asian and Black backgrounds in the UK are more likely to have a lower income. Emotional eating is also a response to stress (Zellner et al., 2006) and depression (van Strien, Konttinen, Homberg, Engels, & Winkens, 2016). South Asian and Black mothers are at a higher risk of depression compared with White British mothers, particularly if they are immigrants to the UK (Nilaweera, Doran, & Fisher, 2014).

As noted in the introduction, maternal eating behaviour is an important concept to understand as it can affect not only her own weight and body image but also her feeding interactions with her child, increasing their risk of overweight or own eating behaviour (Lauzon-Guillain et al., 2009; Morrison, Power, Nicklas, & Hughes, 2013; Rodgers et al., 2013; Wardle et al., 2002). It is possible that maternal eating behaviour therefore has an impact upon child weight and may contribute to increased levels of overweight found in South Asian and Black children in the UK (NHS, 2017). Although of course ethnicity and weight are complex and affected by factors such as genetics (Cecil et al., 2012), diet (Gatineau & Mathrani, 2011), and activity (Owen et al., 2009), this relationship is an important element to consider.

Understanding why these patterns emerge is therefore critical, and further research should be conducted in exploring the origins of eating behaviour between different ethnic groups. Food of course is heavily tied to culture, being part of how identity is formed and maintained (Kumanyika et al., 2008). Food and family are both highly valued and intertwined in South Asian culture (Maiter & George, 2003)

and preparing, cooking, and eating traditional foods with family and friends are central to South Asian culture (Pallan, Parry, & Adab, 2012). Thus, lower levels of restraint and higher levels of emotional eating may be embedded within culture and tradition. Traditional South Asian foods and cooking methods can however lead to a high fat content (Chowdhury, Helman, & Greenhalgh, 2000) and if eaten to excess could exacerbate weight gain.

The opposite is also true, in that culture is tied to eating behaviour, and eating behaviour is not always a positive event. As noted above, emotional eating may also be a coping response to higher levels of stress and depression experienced by South Asian and Black women. The potential increased stress of immigration, loss of community, racism, and poverty can affect both body image and eating behaviour as a coping mechanism (Reddy & Crowther, 2007; Sahi Iyer & Haslam, 2003).

Chinese mothers were more likely to report a feeding style high in restraint and low in uncontrolled eating. Although research among Chinese mothers in the UK and body image is sparse, research examining their feeding interactions with children highlights a tendency for restrictive practices, based on the concept of a “duty response” to protect children from unhealthy Western eating habits. Potentially, similar beliefs are influencing maternal own eating behaviour (Wehrly, Bonilla, Perez, & Liew, 2014).

Limitations to the study include the self-selected sample, with a trend towards older and more educated participants. Potentially, this may be linked to English language completion of the questionnaire and further research may wish to include translated or interviews. However, this is a common pattern in much of public health and social science research due to a tendency to only more interested volunteers taking part. Further research may also wish to take clinical measures of weight and consider whether these relate to maternal eating behaviour.

Recruitment also relied on online data collection, which has been criticized in the past for attracting only more educated or affluence participants (Azar, 2000). However, with the rise of smart phones and internet accessibility, the approach is proving a common and popular approach in health and social science data collection due to the ability to recruit more diverse participants more effectively (e.g., Brown, 2016; Ferguson & Hansen, 2012; Plantin & Daneback, 2009).

Finally, consideration must be given to the limitations of classifying individuals into strict ethnic groups. Although this standardized classification is useful for research purposes and is a widely used approach, care must be taken not to over generalize or indeed stigmatize groups based such broad groupings (Bhopal, 2004). Further research may also wish to explore intra group differences, for example, whether differences arise between Bangladeshi and Pakistani groups for instance. It is also difficult to draw direct comparisons with research examining ethnic differences in other countries such as the USA as ethnic diversity follows a different pattern in the USA compared with the UK, with a lower proportion of the USA from White backgrounds and differences in the largest non-White groups (e.g., African American vs. South Asian; ONS, 2016; United States Census Bureau, 2000).

In conclusion, this study adds an interesting element to existing maternal eating behaviour research in the UK, highlighting the need

for researchers to be mindful in measuring ethnic background and collecting diverse samples. It also raises awareness that dietary and weight interventions around families and healthy eating should be mindful of ethnic differences and cultural influences when providing public health advice.

## ACKNOWLEDGMENT

Umm Al-Qura University, Saudi Arabia.

## CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

## CONTRIBUTIONS

MK was responsible for study design, data collection, data analysis, draft writing, and critical amendments. DR was responsible for study design and critical amendments. PK was responsible for study design and critical amendments. AB was responsible for study design, data analysis and draft writing support, and critical amendments.

## ORCID

Amy E. Brown  <http://orcid.org/0000-0002-0438-0157>

## REFERENCES

- Azar, B. (2000). A web of research: They're fun, they're fast and they save money but do web experiments yield quality results? *Monitor on Psychology*, 31, 42–47.
- Ball, K., & Kenardy, J. (2002). Body weight, body image, and eating behaviours: relationships with ethnicity and acculturation in a community sample of young Australian women. *Eating Behaviors*, 3(3), 205–216.
- Benton, D. (2004). Role of parents in the determination of the food preferences of children and the development of obesity. *International Journal of Obesity*, 28, 858–869.
- Bhopal, R. (2004). Glossary of terms relating to ethnicity and race: For reflection and debate. *Journal of Epidemiology and Community Health*, 58(6), 441–445.
- Braun, T. D., Park, C. L., & Gorin, A. (2016). Self-compassion, body image, and disordered eating: A review of the literature. *Body Image*, 17, 117–131.
- Brown, A. (2016 Apr 1). What do women really want? Lessons for breastfeeding promotion and education. *Breastfeeding Medicine*, 11(3), 102–110.
- Cachelin, F. M., Rebeck, R. M., Chung, G. H., & Pelayo, E. (2002). Does ethnicity influence body-size preference? A comparison of body image and body size. *Obesity*, 10(3), 158–166.
- Cecil, J., Dalton, M., Finlayson, G., Blundell, J., Hetherington, M., & Palmer, C. (2012). Obesity and eating behaviour in children and adolescents: Contribution of common gene polymorphisms. *International Review of Psychiatry*, 24(3), 200–210.
- Chearskul, S., Pummoung, S., Vongsaiyat, S., Janyachailert, P., & Phattharayuttawat, S. (2010). Thai version of three-factor eating questionnaire. *Appetite*, 54, 410–413.
- Chong, M. F.-F., Ayob, M. N. M., Chong, K. J., Tai, E. S., Khoo, C. M., Leow, M. K.-S., ... Khoo, E. Y. (2016). Psychometric analysis of an eating behaviour questionnaire for an overweight and obese Chinese population in Singapore. *Appetite*, 101, 119–124.
- Chowdhury, A. M., Helman, C., & Greenhalgh, T. (2000). Food beliefs and practices among British Bangladeshis with diabetes: Implications for health education. *Anthropology & Medicine*, 7, 209–226.
- Clark, H. R., Goyder, E., Bissell, P., Blank, L., & Peters, J. (2007). How do parents' child-feeding behaviours influence child weight? Implications for childhood obesity policy. *Journal of Public Health*, 29(2), 132–141.
- De Lauzon, B., Romon, M., Deschamps, V., Lafay, L., & Borys, J.-M. (2004). The three-factor eating questionnaire-R18 is able to distinguish among different eating patterns in a general population. *The Journal of Nutrition*, 134, 2372–2380.
- Dodd, S. L., Long, J. D., Boswell, C., & Rogers, T. (2016). Eating behavior in college-students: TFEQ R-18 and qualitative perceptions of cell-phone use for recording diet.
- Faith, M. S., & Kerns, J. (2005). Infant and child feeding practices and childhood overweight: The role of restriction. *Maternal & Child Nutrition*, 1(3), 164–168.
- Ferguson, S., & Hansen, E. (2012). A preliminary examination of cognitive factors that influence interest in quitting during pregnancy. *Journal of Smoking Cessation*, 7, 100–104.
- Gatineau, M., & Mathrani, S. (2011). Ethnicity and obesity in the UK. *Perspectives in Public Health*, 131(4), 159–160.
- Hajna, S., Leblanc, P. J., & Faight, B. E. (2014). Associations between family eating behaviours and body composition measures in peri-adolescents: Results from a community-based study of school-aged children. *Canadian Journal of Public Health*, 105(1), e15–e21.
- Johnson, F., & Wardle, J. (2005). Dietary restraint, body dissatisfaction, and psychological distress: A prospective analysis. *Journal of Abnormal Psychology*, 114(1), 119–125.
- Karlsson, J., Persson, L. O., Sjöström, L., & Sullivan, M. (2000). Psychometric properties and factor structure of the Three-Factor Eating Questionnaire (TFEQ) in obese men and women. Results from the Swedish Obese Subjects (SOS) study. *International Journal of Obesity*, 24(12), 1715–1725.
- Koupil, I., Tooth, L., Heshmati, A., & Mishra, G. (2016). Social patterning of overeating, binge eating, compensatory behaviours and symptoms of bulimia nervosa in young adult women: Results from the Australian Longitudinal Study on Women's Health. *Public Health Nutrition*, 19(17), 3158–3168.
- Kral, T. V., & Rauh, E. M. (2010). Eating behaviours of children in the context of their family environment. *Physiology & Behaviour*, 100(5), 567–573.
- Kumanyika, S. K., Obarzanek, E., Stettler, N., Bell, R., Field, A. E., Fortmann, S. P., ... Stevens, J. (2008). Population-based prevention of obesity. *Circulation*, 118(4), 428–464.
- Lauzon-Guillain, D., Romon, M., Musher-Eizenman, D., Heude, B., Basdevant, A., & Charles, M. A. (2009). Cognitive restraint, uncontrolled eating and emotional eating: Correlations between parent and adolescent. *Maternal & Child Nutrition*, 5(2), 171–178.
- Löffler, A., Luck, T., Then, F. S., Sikorski, C., Kovacs, P., Böttcher, Y., ... Riedel-Heller, S. G. (2015). Eating behaviour in the general population: An analysis of the factor structure of the German version of the three-factor-eating-questionnaire (TFEQ) and its association with the body mass index. *PLoS One*, 10, e0133977.
- Macht, M. (2008). How emotions affect eating: A five-way model. *Appetite*, 50(1), 1–11.
- Maiter, S., & George, U. (2003). Understanding context and culture in the parenting approaches of immigrant South Asian mothers. *Affilia*, 18(4), 411–428.
- Morrison, H., Power, T. G., Nicklas, T., & Hughes, S. O. (2013). Exploring the effects of maternal eating patterns on maternal feeding and child eating. *Appetite*, 63, 77–83.
- NHS (2017). National child measurement programme report 2017 <http://content.digital.nhs.uk/ncmp>
- Nilaweera, I., Doran, F., & Fisher, J. (2014). Prevalence, nature and determinants of postpartum mental health problems among women who have migrated from South Asian to high-income countries: A systematic review of the evidence. *Journal of Affective Disorders*, 166, 213–226.

- NSPL (2011). Postcode area database <https://data.gov.uk/dataset/national-statistics-postcode-lookup-uk>
- Office of National Statistics (2011). UK Census Data 2011 <https://www.ons.gov.uk/census/2011census>
- Office of National Statistics (2016). Overview of UK population [https://www.census.gov/history/www/programs/demographic/decennial\\_census.html](https://www.census.gov/history/www/programs/demographic/decennial_census.html)
- Ogden, J. (2011). *The psychology of eating: From healthy to disordered behaviour*. London: John Wiley & Sons.
- Owen, C. G., Nightingale, C. M., Rudnicka, A. R., Cook, D. G., Ekelund, U., & Whincup, P. H. (2009). Ethnic and gender differences in physical activity levels among 9–10-year-old children of white European, South Asian and African-Caribbean origin: The Child Heart Health Study in England (CHASE Study). *International Journal of Epidemiology*, 38(4), 1082–1093.
- Pallan, M., Parry, J., & Aday, P. (2012). Contextual influences on the development of obesity in children: A case study of UK south Asian communities. *PrevMed*, 54(3–4), 205–211.
- Plantin, L., & Daneback, K. (2009). Parenthood, information and support on the internet: A literature review of research on parents and professionals online. *BMC Family Practice*, 10. <https://doi.org/10.1186/1471-2296-10-34>
- Quick, V. M., & Byrd-Bredbenner, C. (2014). Disordered eating, socio-cultural media influencers, body image, and psychological factors among a racially/ethnically diverse population of college women. *Eating Behaviors*, 15(1), 37–41.
- Reagan, P., & Hersch, J. (2005). Influence of race, gender, and socioeconomic status on binge eating frequency in a population-based sample. *International Journal of Eating Disorders*, 38, 252–256.
- Reddy, S. D., & Crowther, J. H. (2007). Teasing, acculturation, and cultural conflict: Psychosocial correlates of body image and eating attitudes among South Asian women. *Cultural Diversity and Ethnic Minority Psychology*, 13(1), 45–53.
- Rodgers, R. F., Paxton, S. J., Massey, R., Campbell, K. J., Wertheim, E. H., Skouteris, H., & Gibbons, K. (2013). Maternal feeding practices predict weight gain and obesogenic eating behaviours in young children. A prospective study. *International Journal of Behavioural Nutrition and Physical Activity*, 10, 24.
- Sahi Iyer, D., & Haslam, N. (2003). Body image and eating disturbance among south Asian-American women: The role of racial teasing. *International Journal of Eating Disorders*, 34(1), 142–147.
- Shloim, N., Edelson, L. R., Martin, N., & Hetherington, M. M. (2015). Parenting styles, feeding styles, feeding practices, and weight status in 4–12 year-old children: A systematic review of the literature. *Frontiers in Psychology*, 6, 1849.
- Snoek, H. M., Van Strien, T., Janssens, J. M., & Engels, R. C. (2007). Emotional, external, restrained eating and overweight in Dutch adolescents. *Scandinavian Journal of Psychology*, 48(1), 23–32.
- Stunkard, A. J., & Messick, S. (1985). The three-factor eating questionnaire to measure dietary restraint, disinhibition and hunger. *Journal of Psychosomatic Research*, 29(1), 71–83.
- Tan, C. C., & Holub, S. C. (2015). Emotion regulation feeding practices link parents' emotional eating to children's emotional eating: A moderated mediation study. *Journal of Pediatric Psychology*, 40(7), 657–663.
- Tiggemann, M., & Lynch, J. E. (2001). Body image across the life span in adult women: The role of self-objectification. *Developmental Psychology*, 37(2), 243–253.
- United States Census Bureau (2000). US Census Data 2000
- van Strien, T., Konttinen, H., Homburg, J. R., Engels, R. C., & Winkens, L. H. (2016). Emotional eating as a mediator between depression and weight gain. *Appetite*, 100, 216–224.
- Ventura, A. K., & Birch, L. L. (2008). Does parenting affect children's eating and weight status? *International Journal of Behavioural Nutrition and Physical Activity*, 5(15), 1–12.
- Wardle, J., & Marsland, L. (1990). Adolescent concerns about weight and eating: A social-developmental perspective. *Journal of Psychosomatic Research*, 34(4), 377–391.
- Wardle, J., Sanderson, S., Guthrie, C. A., Rapoport, L., & Plomin, R. (2002). Parental feeding style and the inter-generational transmission of obesity risk. *Obesity*, 10(6), 453–462.
- Webber, L., Hill, C., Cooke, L., Carnell, S., & Wardle, J. (2010). Associations between child weight and maternal feeding styles are mediated by maternal perceptions and concerns. *European Journal of Clinical Nutrition*, 64(3), 259–265.
- Wehrly, S. E., Bonilla, C., Perez, M., & Liew, J. (2014). Controlling parental feeding practices and child body composition in ethnically and economically diverse preschool children. *Appetite*, 73, 163–171. <https://doi.org/10.1016/j.appet.2013.11.009>
- Woods, A. M., Racine, S. E., & Klump, K. L. (2010). Examining the relationship between dietary restraint and binge eating: Differential effects of major and minor stressors. *Eating Behaviors*, 11(4), 276–280.
- Wyatt, S. B., Winters, K. P., & Dubbert, P. M. (2006). Overweight and obesity: Prevalence, consequences, and causes of a growing public health problem. *The American Journal of the Medical Sciences*, 331(4), 166–174.
- Zellner, D. A., Loaiza, S., Gonzalez, Z., Pita, J., Morales, J., Pecora, D., & Wolf, A. (2006). Food selection changes under stress. *Physiology & Behaviour*, 87(4), 789–793.

**How to cite this article:** Korani M, Rea DM, King PF, Brown AE. Maternal eating behaviour differs between ethnic groups: Considerations for research and practice. *Matern Child Nutr.* 2018;14:e12630. <https://doi.org/10.1111/mcn.12630>