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# **Significant differences in maternal child-feeding style between ethnic groups in the UK: the role of deprivation and parenting styles**

Korani, M., Rea, D.M., King, P.F., & Brown, A.E.

Affiliation: Department of Public Health, Policy and Social Sciences

Swansea University

Running title: Ethnic differences maternal child feeding style

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

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## **Corresponding author details**

Dr. Amy Brown

Department of Public Health, Policy and Social Sciences

Swansea University

UK

SA2 8PP

+44 1792 518672

[a.e.brown@swansea.ac.uk](mailto:a.e.brown@swansea.ac.uk)

## **Abstract**

Background: Non-responsive maternal child feeding interactions such as restricting, pressurizing and emotional feeding, can affect child ability to self-regulate intake and increase risk of overweight. However, despite findings that South Asian and Black children living in the UK are more likely to be overweight, UK research has not considered how maternal child-feeding style might differ between ethnic groups. The aim of the research was to explore variations in maternal child-feeding style between ethnic groups in the UK, taking into account associated factors such as deprivation and parenting style.

Methods: 659 UK mothers with a child aged 5 – 11 years old completed a questionnaire. Items included ethnicity and demographic data, and copies of the Child Feeding Questionnaire, Parental Feeding Styles Questionnaire and Parenting Styles and Dimensions Questionnaire.

Results: Significant differences in perceived responsibility ( $p=.002$ ), restriction ( $p=.026$ ), pressure to eat ( $p=.045$ ), instrumental feeding ( $p=.000$ ) and emotional feeding ( $p=.000$ ) were found between the groups. Mothers from South Asian backgrounds reported higher levels of pressure to eat, emotional feeding and indulgent feeding styles, whilst mothers from Chinese backgrounds reported greater perceived responsibility and restriction. Mothers from Black and White British backgrounds were not significantly higher on any behaviour. Maternal child-feeding style was also associated with deprivation and parenting style, but these did not fully explain the data.

Conclusions: Understanding cultural factors behind maternal child-feeding style, particularly around pressurizing and indulgent feeding behaviours may be an important part in reducing levels of child overweight and obesity in the UK.

**Key words:** Maternal child-feeding style; Ethnicity; South Asian; Child overweight; Emotional feeding; Pressurising feeding style

## **Background**

A significant body of work has explored the impact of maternal child feeding style upon child eating behaviour and weight highlighting the protective nature of responsive feeding interactions<sup>1</sup>. Behaviours such as intensive monitoring, pressurizing intake and restricting certain foods are associated with eating in the absence of hunger and food fussiness, and in some cases increased likelihood of under or overweight<sup>2-5</sup>. Exerting too much control over a child's natural ability to regulate their own appetite breaks down this ability, whilst pressurizing a child to consume a food they dislike further exacerbates fussiness<sup>6</sup>.

Maternal child feeding style is associated with a number of factors including demographic background and wider parenting style. For example, mothers living in areas of deprivation are more likely to report lower levels of monitoring and higher levels of pressure to eat<sup>7,8</sup>. Meanwhile, mothers who adopt a controlling authoritarian parenting style are also more likely to be controlling in their approach to child feeding<sup>9,10</sup>.

Research in the United States also highlights variation in maternal child-feeding style between ethnic group. Both pressure to eat<sup>11</sup> and restriction<sup>12</sup> are higher amongst Hispanic parents compared to white parents, whilst Hispanic and Black parents are more likely to report using food to calm or shape a child's behavior<sup>13</sup>. In the UK however, research is sparse. A recent study amongst mothers of pre school children found that South Asian and Black Afro Caribbean parents used higher levels of pressure to eat, emotional feeding, and instrumental feeding compared to White parents<sup>14</sup>. As part of another study, mothers from Pakistani backgrounds in Bradford were more likely to use authoritarian feeding styles (similar to pressurizing feeding) with their toddlers compared to White British mothers<sup>15</sup>.

This lack of consideration of how ethnicity may affect maternal child feeding style in a UK setting is important as data from the Child Measurement programme in the UK

consistently shows that children aged 5 and 11 from Black and South Asian backgrounds are more likely to be overweight or obese compared to White children, with children from Chinese backgrounds having the lowest risk<sup>16</sup>. However research to understand this relationship from a UK perspective is sparse, focusing simply on genetic risk<sup>17</sup>, dietary intake<sup>18</sup>, and physical activity<sup>19</sup>.

Given links between maternal child feeding style, ethnicity and child weight outside of the UK, examining this relationship in a UK context is important. UK specific research is needed as direct generalisability between US research and the UK cannot be made as large differences in demography are seen. In the USA, the largest non-White groups are African American and Mexican families, whilst the largest non-white ethnic groups in the UK are Asian and Asian British. Additionally, demographic make up is different; in the UK only 13% of the UK population is non-White compared to 28% in the USA<sup>20,21</sup>.

The primary aim of the current study was therefore to explore how maternal child feeding style may differ between ethnic groups in the UK, with a focus on primary school aged children (aged 5 – 11). Given that ethnicity is a complex factor, secondary aims included understanding how demographic background (e.g. deprivation, education) and parenting style affected these relationships.

## **Method**

### ***Participants***

Mothers living in the UK with at least one child aged 5 – 11 took part. Exclusion criteria included maternal inability to consent, maternal age younger than eighteen years, and significant child health issues that would impact on feeding interactions. Ethical approval according to the Declaration of Helsinki was granted by a University research ethics committee and all participants gave informed consent.

### ***Measures***

Participants completed a self-reported questionnaire consisting of demographic background, ethnicity data, and feeding style variables. If participants had more than one child in the 5 – 11 age range, they were asked to focus on one child to complete their responses.

Ethnicity data was 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)<sup>22</sup>. The Postcode area database was used to extract data reporting the deprivation level of the area<sup>23</sup>. Further demographic data collected included maternal age, education level, household income, employment, occupation, marital status and number of children in the family.

To examine maternal child feeding style, participants completed all scales of the Child Feeding Questionnaire<sup>24</sup> (CFQ) and all scales of the Parental Feeding Style Questionnaire<sup>25</sup> (PFSQ). Finally, mothers completed all three scales of the Parenting styles and Dimensions Questionnaire [PSDQ]<sup>26</sup>.

***Procedure:***

Data collection was undertaken between October 2015 to May 2016. To ensure that the sample was diverse, data collection was multifaceted including online data collection, schools data collection, and through cultural and religious groups across the UK. Both paper copies and an electronic version of the questionnaire hosted by Survey Monkey were available.

For the online data collection, adverts were placed for the study on parenting forums that had specific boards where research recruitment is allowed. Social media was also used to disseminate the study information link. Parenting groups were approached, and posters placed in community centres, specifically those with diverse ethnic and religious membership. Schools were also contacted by the lead researcher to share information about the study with parents. Given the need for a diverse sample, schools in areas with greater diversity in the UK were approached. Initial contact was

made with the headteacher of the school who shared information with parents via school newsletters. Study information highlighted the need for participants from diverse backgrounds due to the lack of diversity in existing research.

For all adverts, interested participants could click on a link that led to the online version of the questionnaire where participants could read study information and consent questions. The remainder of the questionnaire opened only if consent items were completed. At the end of the questionnaire a debrief was loaded with information about the study and details of how to contact the researcher if required.

### **Data analysis**

Data were analysed using IBM SPSS statistics (version 22.0). Ethnic groups were classified according to UK census<sup>22</sup> (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 CFQ, PFSQ and PDSQ were all scored according to instructions. The association between maternal demographic factors and ethnicity was examined and significant associations used as covariates in further analyses. MANCOVA were then used to explore differences in the CFQ, PFSQ and PDSQ between ethnic groups, also considering whether PDSQ then explained differences in maternal child feeding style. Post hoc bonferonni tests were used to explore significant differences between groups.

### **Results**

Six hundred and fifty-nine 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 ninety (59.2%) were White British, 145 (22.0%) South Asian, 84 (12.7%) Chinese



and 40 (6.1%) Black or Black British. Further details of the sample are shown in table one.

### ***Ethnicity and demographic background***

A significant difference was found for number of children between ethnic groups. South Asian and Black groups had the highest number of children, followed by White British and Chinese. A significant association was also found between ethnic group and income group ( $X = 64.09$ ,  $p = .000$ ). Compared to white families, Asian and Black families were less like to have a higher income band. Significant associations were also seen between ethnic group and level of education [ $X = 60.55$ ,  $p = .000$ ], maternal employment [ $X = 84.05$ ,  $p = .000$ ] and occupation group [ $X = 62.822$ ,  $p = .000$ ]. Mothers from white and Chinese backgrounds had higher levels of education than Black and Asian mothers. Mothers from White and Black backgrounds were more likely to be employed and mothers from White background were more likely to have professional or managerial occupations. No significant association was found for area deprivation between ethnic groups. Further analyses therefore controlled for income, occupation, employment, family size, education and marital status.

### ***Selected child***

Mean age of child selected was 7.1 (SD: 1.51) with a range from 5 – 11 years. Three hundred and ninety-eight children were male (60.4%) and 261 (n = 39.6%) were female. Four hundred and sixty-eight (71.0%) responded for their first-born child and 191 (30.0%) for a second born or more child. There was no significant difference in age, gender or birth order for chosen child between ethnic groups.

### ***Maternal child-feeding style***

Table two identifies significant differences in maternal child-feeding style between ethnic groups. For the Child Feeding questionnaire, mothers from Chinese and White backgrounds reported significantly higher perceived responsibility than those from Asian and Black backgrounds. For restriction, Chinese mothers had the highest levels followed by Black, White British and then South Asian. For pressure to eat, South Asian mothers reported the highest levels followed by Chinese, Black and then White British.

For instrumental feeding South Asian mothers again reported the highest levels followed by White British and Chinese mothers. No significant differences were seen for monitoring.

For the Parental Feeding Styles Questionnaire, South Asian mothers reported both the highest levels of instrumental feeding and emotional feeding, followed by White British and Black, with Chinese mothers the lowest.

### ***Does parenting style explain differences in child feeding style?***

For the PSDQ, using Pearson's  $r$  correlation, significant negative correlations were found between authoritative parenting and maternal use of pressure to eat ( $r = -.120$ ,  $p = .002$ ), restriction ( $r = -.089$ ,  $p = .023$ ), instrumental ( $r = -.160$ ,  $p = .000$ ) and emotional ( $r = -.199$ ,  $p = .000$ ) feeding practices. Authoritarian parenting was also significantly positively associated with pressure to eat ( $r = .103$ ,  $p = .008$ ), instrumental ( $r = .187$ ,  $p = .000$ ), emotional ( $r = .196$ ,  $p = .000$ ) feeding practices. Finally, permissive parenting was significantly negatively associated with control ( $r = -.097$ ,  $p = .013$ ) and encouragement ( $r = -.107$ ,  $p = .006$ ). A positive correlation was also found between permissive parenting and instrumental ( $r = .194$ ,  $p = .000$ ) and emotional ( $r = .166$ ,  $p = .000$ ) feeding practices.

Parenting style also differed between ethnic groups. Although no significant difference was seen between groups for Authoritative parenting [ $F(3, 651) = 1.855$ ,  $p = .136$ ], significant differences were found for Authoritarian [ $F(3, 651) = 13.765$ ,  $p = .000$ ] and Permissive parenting [ $F(3, 651) = 6.202$ ,  $p = .000$ ]. Chinese and South Asian mothers were both significantly higher than both White British and Black mothers for Authoritarian style, whilst for Permissive parenting South Asian parents scored the highest, followed by White British and then Black and Chinese.

Parenting style was therefore placed as a covariate in the MANCOVA exploring differences in maternal child feeding style between ethnic groups. All differences remained significant for perceived responsibility [ $F(3, 644) = 4.907$ ,  $p = .002$ ],

restriction [ $F(3, 644) = 4.766, p = .003$ ], pressure to eat [ $F(3, 644) = 4.561, p = .000$ ], emotional feeding [ $F(3, 644) = 14.712, p = .000$ ], and instrumental feeding [ $F(3, 644) = 6.075, p = .000$ ].

## **Discussion**

The aim of this study was to explore how maternal child feeding style might differ between ethnic groups in the UK. Although research has examined how differences in weight related factors such as genetics<sup>17</sup>, diet<sup>18</sup> and activity levels<sup>19</sup> can differ between ethnic groups, variations in psychosocial predictors of childhood obesity such as maternal child feeding style have not been examined in ethnically diverse samples in the UK. This is the first study in the UK to identify that a number of differences exist for mothers of school-aged children.

A number of differences emerged. Pressurising feeding approaches such as pressure to eat, instrumental feeding and emotional feeding were highest amongst South Asian mothers, whilst restrictive practices – restriction and perceived responsibility – were highest amongst Chinese mothers. Both White and Black mothers generally fell in the middle range. These findings are significant for those working to support diverse families with child weight and diet.

In terms of how this fits with existing research, data from a UK perspective is sparse. As noted in the introduction, mothers of preschool children from Black and South Asian backgrounds have been identified as higher in pressurising, emotional feeding and instrumental feeding compared to White British mothers<sup>14</sup>, whilst mothers of Pakistani origin are also more likely to use a pressurizing approach<sup>15</sup>. Comparatively in the USA, the topic is better explored showing similar patterns to the current study. Compared to White mothers, African American<sup>27</sup> and Mexican mothers<sup>28</sup> use higher levels of pressure to eat, whilst Chinese parents are higher in restrictive feeding practices<sup>29,30</sup>. Finally, Hispanic and Black parents are more likely to report using food to calm or shape a child's behavior compared to white parents<sup>13</sup>.

Of course, direct comparisons cannot and should not be made between 'white' and 'all other' ethnic groups for a number of reasons<sup>31</sup>. Firstly, ethnic diversity follows a different pattern in the USA compared to the UK, with a lower proportion of the USA from White backgrounds and differences in the largest non White groups (e.g. African American versus South Asian)<sup>20,21</sup>.

However, there are also a number of parallels; Black and South Asian groups in the UK and Hispanic, Latino, and African American groups in the USA have on average higher poverty and lower education levels compared to White groups<sup>32,33</sup>. Poverty and lower education in turn have been associated with maternal preferences and perceptions for child weight. Parents from lower income groups are less likely to realise their child is overweight, perceiving a larger size as healthier<sup>34</sup>. Families living in deprivation are also more likely to pressurize their children to eat driven by a lack of affordability to waste food<sup>35</sup>. Therefore any difference between ethnic groups may simply be a difference in deprivation or education, rather than other cultural aspects, and in the current research, household income played an important but not exclusive role.

Parenting style was included in the analyses due to established associations between parenting style and ethnicity and parenting style and child feeding style. The findings here reflected previous research. Chinese mothers were typically higher in Authoritarian practices whilst South Asian mothers higher in both authoritarian and permissive feeding styles<sup>36,37</sup>. Meanwhile authoritarian parenting approaches were associated with more controlling feeding practices<sup>9,10</sup>. However, although related to maternal child feeding style, they did not fully explain differences between ethnic groups.

Given established (but not always conclusive) associations between maternal factors and child weight<sup>1</sup>, these findings add an important element to the literature as they may in part explain differences in the risk of childhood overweight and obesity in the UK. Emotional or instrumental feeding can lead to child overeating in the absence of hunger<sup>38</sup>, and therefore overweight<sup>39</sup>. Meanwhile, pressure to eat can have a different effect often depending on what is being pressured and why. Pressurising a child to eat

more can lead to picky eating and a lower intake of food as the child further avoids eating the target food<sup>40</sup>. However, pressurising a child to eat more or overeat, especially when foods are more palatable, can sometimes lead to overweight, as the child learns to respond to external cues to eat rather than internal cues for hunger<sup>41</sup>.

Taken together, these findings may in part explain why children from South Asian backgrounds are more likely to be overweight. Food may be used for reward, bribery or for emotional reasons rather than simply for nutrition. This may be linked to preferences for a larger body size in South Asian cultures due to associations with wealth and prestige<sup>42</sup> and research has shown that mothers from Bangladeshi backgrounds living in the UK do state a preference for a larger child in comparison to White British mothers<sup>43</sup>.

However, food and eating are not simply about body size; they are strongly tied to how cultural identity and belonging is formed<sup>44</sup>. Research with South Asian adults consistently shows that food and family are both highly valued and intertwined<sup>45</sup>. Traditional foods are strongly seen as part of culture, and eating in certain ways, or coming together to cook and share food is seen as a way of staying attached to family and community<sup>46</sup>. However, traditional Asian food and ways of cooking can be high in calories and fat, leading to overconsumption, especially if eaten in the absence of hunger<sup>47</sup>.

Notably, Chinese mothers were more likely to use restrictive and monitoring feeding approaches, potentially reflecting research that shows Chinese parents are more likely to use restrictive practices as a 'duty response' to preventing children from adopting unhealthy Western eating habits<sup>48</sup>. However, restricting a child's intake can increase preferences for that food and children who are heavily restricted are more likely to over eat in the absence of hunger<sup>49</sup> which is at odds with the lower incidence of overweight amongst Chinese children in the UK. Potentially, as Chinese parents also have higher levels of strict authoritarian parenting<sup>29</sup> this prevents children gaining free access to palatable foods and overeating. Research with younger children shows that restriction can decrease risk of overweight, until the point in which children have more

freedom to feed themselves<sup>50</sup>. It would be interesting to explore the long term impact of this behaviour, once children have greater access to food.

Mothers from Black backgrounds did not report high levels of non-responsive feeding styles as mothers from South Asian backgrounds did, challenging the hypothesis that feeding styles might contribute to increased levels of overweight in this group. However, this may be because although children and adults from Black backgrounds are more likely to be calculated as overweight, they often do not have increased fat mass, or indeed have a lower percentage body fat than other groups<sup>51,52</sup>.

The findings suggest that interventions to promote more responsive feeding patterns amongst South Asian families may be a potential way to reduce increased levels of overweight and obesity. Interventions that encourage parents to feed their children in a responsive manner, do decrease non-responsive feeding behaviours such as pressure to eat, but do not always affect weight<sup>53,54</sup>.

However these messages must be embedded within a culturally sensitive and acceptable context. The association between food, love and social connectedness is strong amongst South Asian families<sup>45</sup>. Social wellbeing plays an important role in enhancing quality of life and even lifespan<sup>55</sup> and contributes to enhanced mental health amongst South Asian children living<sup>56</sup>. Not being able to uphold religious and cultural practices can affect the mental health of South Asian women<sup>57</sup>, as can fear of exclusion through not keeping with traditions<sup>58</sup>.

It would be disrespectful and unhelpful to suggest that families change their entire way of eating to meet health advice, and highly unlikely for changes to be made. Interventions should establish what is acceptable and realistic to change. For example, beliefs and practices around food may not be moveable<sup>59</sup>, but changes to physical activity or other non-traditional elements of cooking and diet may be acceptable<sup>60</sup>. For example, school-based interventions that are delivered during the school day,

have been shown to be more effective compared to after school activities when South Asian children may be attending the Mosque<sup>61</sup>.

This study does have limitations. Participants were asked to focus on one child which may have affected their response. However asking participants to repeat the questionnaire per child would be a further demand on their time, and might skew the findings towards mothers with more than one child, if maternal feeding style is stable across children. Research exploring whether maternal child feeding style is stable across children is mixed. Some findings suggest that it is stable across siblings<sup>62</sup> whereas others find it differs according to the weight of the child<sup>63</sup>. Further research may wish to examine how this occurs amongst more diverse groups.

The sample was also self-selecting, and although a variety of age and demographic backgrounds were seen, was weighted towards older, more educated and affluent mothers, which given associations between feeding styles and deprivation may have reduced the effect of this data. Only the most interested mothers may have taken part. However this is a common issue with most behavioural research, not only with survey based designs.

The research also relied on internet recruitment to increase the diversity of the sample. Internet based recruitment methods have been criticised as being biased to the more affluent educated participant in the past<sup>64</sup>. However in recent years, with the vast spread and availability of the internet on pocket devices<sup>65</sup>, these limitations no longer hold and this is now a common data collection approach in the health and social sciences<sup>66 - 68</sup>.

Finally, the issue of classifying ethnicity should be raised. Classifications need to be made for analysis but there is a risk of bias, over generalizing and marginalisation to suggest that everyone who falls within a certain ethnic group is in some way the same. However, standardised classification of ethnicity in general is useful and is very common in the context of health studies in order to address health inequalities<sup>31</sup>.

However further research may wish to explore within these wider groups more deeply.

Limitations aside, novel and interesting patterns arose within the data. These results clearly point to a pattern in maternal child feeding style that may be contributing to established differences in child weight between ethnic groups. This is particularly apparent amongst South Asian mothers, who showed more pressurising and emotional feeding styles. Although a pattern related to restrictive child feeding was seen amongst the Chinese group, the South Asian findings are of particular significance as they potentially relate to an increase in child overweight and obesity in this group in the UK.

### **Transparency statement**

The lead author affirms that this manuscript is an honest, accurate, and transparent account of the study being reported. The reporting of this work is compliant with STROBE guidelines. The lead author affirms that no important aspects of the study have been omitted and that any discrepancies from the study as planned have been explained.

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**Table 1: Participant demographic background**

<b>Demographic</b>	<b>Group</b>	<b>N</b>	<b>%</b>
<b>Education</b>	GCSE	72	10.9
	A level	131	19.9
	Degree	227	34.4
	Vocational	90	13.7
	Postgrad	138	20.9
<b>Marital status</b>	Married	397	60.2
	Cohabiting	149	22.6
	Partner	39	5.9
	Single	70	10.6
	Widowed	4	0.5
<b>Employment</b>	Full time	321	48.8
	Part time	229	34.7
	None	109	16.5
<b>Occupation</b>	Higher professional/managerial	142	21.5
	Lower professional/managerial	189	28.7
	Skilled	133	20.2
	Routine occupations	74	11.2
	Unemployed	18	2.7
	Stay at home mother	91	13.8
<b>Income group per month</b>	Less than £1000	27	4.1
	£1001-1700	76	11.5
	£1701-2700	156	23.7
	£2701-4200	202	30.7
	£4201	176	26.7
	Rather not say	22	3.3



**Table two: Maternal differences in child-feeding style between ethnic groups  
(means and standard deviations)**

		White British	South Asian	Chinese	Black	Significance
Child Feeding Questionnaire	Perceived responsibility	3.57 (1.03)	3.20 (.94)	3.65 (.75)	3.41 (.82)	F (3, 590) = 5.143, p = .002
	Concern for child weight	1.64 (.61)	1.67 (.53)	1.66 (.49)	1.74 (.40)	F (3, 590) = .298, p = .827
	Monitoring	3.39 (.97)	3.24 (.95)	3.64 (2.31)	3.36 (1.65)	F (3, 590) = .1470 p = .222
	Restriction	2.85 (.73)	2.83 (.60)	3.12 (.58)	3.01 (.71)	F (3, 590) = 3.113, p = .026
	Pressure to eat	2.63 (.88)	2.97 (1.12)	2.94 (.63)	2.85 (.61)	F (3, 590) = 2.698, p = .045
Parental Feeding Styles Questionnaire	Instrumental	2.44 (.92)	2.81 (1.10)	2.31 (.98)	2.74 (1.11)	F (3, 592) = 6.053, p = .000
	Control	3.48 (.52)	3.63 (.66)	3.52 (.58)	3.50 (.52)	F (3, 592) = 1.625, p = .182
	Emotional	2.19 (.80)	2.45 (.87)	1.81 (.60)	2.38 (.78)	F (3, 592) = 11.607, p = .000
	Encouragement	3.73 (.60)	3.62 (.60)	3.62 (.74)	3.68 (.59)	F (3, 592) = 2.981, p = .061