The relationship between caregivers’ feeding practices and children’s eating behaviours among preschool children in Ethiopia

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ABSTRACT

Preschool age is a time when distinct eating behaviours are formed. Eating behaviours have been associated with underweight and poor growth as well as with overweight. However, the relationship between caregivers’ feeding practices and children’s eating behaviours remains poorly understood in developing countries. This study aims to evaluate the association between caregivers’ feeding practices and eating behaviours among preschool children in Ethiopia. We conducted a school-based cross-sectional study among 542 caregivers of children aged between three and six years old. We used the Children Eating Behaviour Questionnaire and the Child Feeding Questionnaire to measure eating behaviour and caregivers’ feeding practices respectively. A multiple linear regression was fitted to determine the association between caregivers’ feeding practices and the multiple scales of children’s eating behaviour while adjusting for potential confounders. Children whose caregivers practice food restriction tended to be more food responsive (β = 0.23, p < 0.001), tend to emotionally overeat (β = 0.09, p < .01), have more desire to drink (β = 0.24, p < .001), tend to eat slower (β = 0.10, p < .01). Meanwhile, children whose caregivers practiced pressure to eat were fussier about food (β = 0.09, p < .001), were more satiety responsive (β = 0.13, p < .001) and tended to eat slower (β = 0.10, p < .01). In Ethiopia, where under- and over-nutrition coexist among pre-school children, the results from this study underscore the importance of investigating eating behaviours at an early age, as these eating styles may contribute to children’s poor nutritional status. It is also essential to include appropriate child eating behaviour and specific feeding practices components, together with responsive feeding in national nutritional programmes to improve the nutritional status of children aged 24–59 months.

1. Background

Feeding is a primary event in the life of an infant or young child. It is the focus of attention for parents and other caregivers, and a source of social interaction through verbal and nonverbal communication (Liu & Stein, 2005). Eating behaviours are biological and behavioural processes directed towards meeting the requirements for health and growth (Savage et al., 2007). Parents and caregivers influence their children’s eating behaviour during feeding processes by communicating their attitudes and beliefs about food and feeding (Harbron & Booley, 2013). Strategies used by caregivers include direct attempts to control children’s food intake, such as pressuring children to eat more or restricting their intake of "unhealthy" foods. Control may also be exerted indirectly by monitoring the child’s intake of unhealthy foods (Do et al., 2015). In particular, the preschool age is a time when distinct eating behaviours are formed since children go through remarkable transitions in eating behaviour during this period (Ashcroft et al., 2008). At this age, communication between children and their caregivers develops as they start establishing more autonomy. However, they are still highly dependent on their parents or caregivers to structure their food intake (Rimm-Kaufman & Pianta, 2000).

Eating behaviours can contribute to poor nutritional status among children (Kumar et al., 2018; Passos et al., 2015; Roy et al., 2020) and are associated with underweight, poor dietary adequacy and overweight and obesity (Jansen et al., 2012; Kwon et al., 2017). This has been evidenced by studies that have found an association between...
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process and the factors that influence it (Savage et al., 2007). Moreover, the prevalence of maternal depression is 23.3% (Fantahun et al., 2016). A recent study in Ethiopia, the prevalence of child undernutrition (Madeghe et al., 2016). In Ethiopia, the prevalence of child undernutrition is 23.3% (Savage et al., 2007). Studies have shown that parents’ practice of greater food restriction is associated with a higher concern about child overweight, whereas greater practice of pressuring child to eat is associated with greater concern about child underweight (Gregory et al., 2018b; Warke et al., 2018). These feeding practices in turn might lead to child’s lower interest in food (Gregory et al., 2010a) or development of obesogenic eating behaviors including emotional eating and tendency to overeat (Rodgers et al., 2013). Understanding the local context is imperative to explaining the dynamics of the child feeding process and the factors that influence it (Savage et al., 2007). Moreover, recent studies done in Addis Ababa have also revealed the cultural influence on perceptions of “healthy” appearance, unhealthy weight control behaviour, and disordered eating attitudes among adolescents (Tuffa et al., 2020; Yirga et al., 2016). This indicates the importance of more research on eating behaviours that manifest in early childhood as they can be a precursor to maladaptive eating later in life.

Developing countries are currently facing a double burden of malnutrition with a surge in overweight and obesity (Abdullah, 2015). The co-existence was evident among pre-schoolers in a recent study in Addis Ababa, where a high prevalence of overweight/obesity (11.4%) and undernutrition (19.6%) was reported (Berhane et al., 2020). Fast-tracked urbanisation and rapid socioeconomic and lifestyle changes in cities are disrupting both access to food and feeding practices. High rates of urban poverty conflated with fluctuating food prices have increased vulnerability among the growing urban population (Berhane et al., 2018). Furthermore, inappropriate feeding practices is a major cause of malnutrition (WHO, 2017). In Ethiopia, efforts to improve feeding have often relied on increasing the energy density of food by fortifying to increase nutrient density (Tenagashaw et al., 2017). To date, few studies have been conducted in rural parts of Ethiopia to evaluate the relationship between feeding practices with nutritional status and food intake of children (Abebe et al., 2017; Tariku, 2016). For instance, a study in northern Ethiopia (West Gojam) found that caregivers of stunted children had poorer complementary feeding practice and were less responsive to the child’s hunger and satiation cues. It was also found that the children had a very low appetite as reflected in the very low number of mouthfuls accepted (Abebe et al., 2017). This indicates the need to examine appetitive traits and caregivers’/parents’ child feeding practices.

In addition, caregivers with depressive symptoms tend to display attitudes such as having little interest or trouble concentrating in doing things and be disengaged in caregiver–child interaction, including the use of less sensitive child-feeding practices (McLearn et al., 2006). Depression among caregivers has also been reported to contribute to child undernutrition (Madeghe et al., 2016). In Ethiopia, the prevalence of maternal depression is 23.3% (Fantahun et al., 2016). A recent study has shown that maternal depression is significantly associated with inappropriate complementary feeding and stunting (Anato et al., 2019). Children with psychological problems also makes feeding interaction difficult, since they tend to have impaired eating skills, such as hypersensitivity to taste and texture, which affect the eating process (Zucker, Copeland, Franz, Carpenter, Keeling, Angold, et al.). Different temperamental dimensions have also been linked to various types of eating behaviours in childhood (Steinsbekk et al., 2020). In Ethiopia, about 23% of children have mental health problems (WHO, 2015). Therefore, caregivers’ and children mental health status play a major role in influencing child feeding interaction and should be accounted for when examining relationships between feeding practices and eating behaviours.

In summary, the different dimensions of children’s eating behaviours and their associations with specific feeding practice has not yet been investigated in the context of developing countries such as Ethiopia. This study thus aims to examine the association between caregivers’ feeding practices and eating behaviours among preschool children in Addis Ababa.

2. Methods

2.1. Participants and procedures

This school-based cross-sectional study involved 542 caregivers of children aged between three and six attending preschools in Addis Ababa, the capital city of Ethiopia. We used a multi-stage sampling technique to obtain a representative sample of study participants. The study examined all preschool children attending selected schools in Addis Ababa during the academic year 2018/2019 and their parents/caregivers, with the inclusion criteria of children aged between three and six years. The schools were selected by first stratifying the sub-cities into three strata by using socioeconomic status indicators. Second, a random sampling was applied and one sub-city from each stratum was selected. Third, a probability proportional to size sampling was used to select four schools from each sub-city. Finally, a simple random procedure was used to select students using school registers from each grade.

The study samples were recruited after obtaining permission from the Addis Ababa City Administration Education Bureau and from the preschools that were selected. Parents/caregivers of the randomly selected students were recruited by sending an invitation to participate in the study through the school’s teachers. These invitations targeted a “primary caregiver” that is the person who knows the most about how and what the child is fed. Usually (but not always) this will be the child’s mother (WHO, 2010). And those willing to participate came to the schools at the appointed time, which was usually early in the morning or late in the afternoon. Informed consent was obtained after explaining the main purpose of the study. Finally, the parents/caregivers completed an anonymous interview-based questionnaire. The children’s anthropometric measurements were taken the next day.

The study was ethically approved by the Institutional Review Board at the School of Public Health as project number 0011. Written informed consent was obtained from the parents/caregivers to participate in the study. All the questionnaires used were first prepared in English and later translated into the local Amharic language. Face validity was checked with the aim of clarifying wording, and the likelihood of the target audience’s ability to answer the questions was tested by conducting two focus group discussions with a total of 20 caregivers (10 caregivers per group). These were conducted for the 35 items in the Children Eating Behaviour Questionnaire (CEBQ) (Wardle et al., 2001), for the 31 items in the Child Feeding Questionnaire (CFQ) (Birch et al., 2001), and for concern about child underweight scale (three items) in the pre-schooler feeding questionnaire (Baughcum et al., 2001). One of the discussion points was “How to best structure the items in a way that could be understood in the context of the country without missing the main intention of the questions”. During the focus group discussion, none of the 20 caregivers were unsure about the action verbs used to describe emotions on some of the CEBQ items, and the questions seemed redundant to them. Five of the caregivers did not understand the local Amharic terms for a few of the CEBQ items. These items were therefore modified and rephrased. The remaining items were kept in their original form, since they created no problems or confusion in understanding the
items and were contextually accepted by the caregivers.

### 2.2. Measurements

#### 2.2.1. Children’s eating behaviour

Eating behaviour was measured using the CEBQ, which is a multi-dimensional, parent/caregiver-reported questionnaire. The tool has good psychometric properties, as it is validated against observations of children’s eating behaviour (Fernandez et al., 2018) and has good internal validity, with a Cronbach’s alpha ranging from 0.72 to 0.91 (Wardle et al., 2001). The CEBQ is divided into eight subscales, four of which measure food approach behaviours: (i) emotional overeating, (ii) enjoyment of food, (iii) food responsiveness, and (iv) desire to drink, while the remaining four subscales measure food avoidant behaviours: (v) emotional undereating, (vi) slowness in eating, (vii) satiety responsiveness, and (vii) fussiness. The responses to each item in the subscales of the CEBQ were categorised using a five-point Likert frequency scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always).

#### 2.2.2. Child feeding questionnaire

The CFQ is used to measure parent/caregiver beliefs, attitudes, and practices regarding child feeding. It is reported to have good internal consistency, with a Cronbach’s alpha value ranging from 0.70 to 0.92 (Birch et al., 2001). Three subscales from the CFQ were used to measure parental/caregivers feeding practices: (i) restriction (8 items) (ii) pressure to eat (4 items) and (iii) monitoring (3 items). The responses to restriction and pressure to eat practices were categorised using a five-point Likert scale (1 = disagree, 2 = slightly disagree, 3 = neutral, 4 = slightly agree, 5 = agree). The responses to monitoring practices were also categorised using a five-point Likert scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always).

The CFQ was also used to assess perceived feeding responsibility, perceived caregiver weight and child weight, and concern about child overweight. Perceived feeding responsibility scale has three items measuring caregivers’ perceptions of their responsibility for child feeding, answered using a five-point Likert scale (1 = disagree, 2 = slightly disagree, 3 = neutral, 4 = slightly agree, 5 = agree). The responses to monitoring practices were also categorised using a five-point Likert scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always).

Concern about child overweight scale has three items which assess caregivers’ concerns about the child’s risk of being overweight and was measured using a five-point Likert scale (1 = uninterested, 2 = underweight, 3 = normal, 4 = overweight, 5 = markedly overweight).

Concern about child underweight scale assess caregivers’ concerns about the child’s risk of being underweight, and were measured using a five-point Likert frequency scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always) from the Pre-schooler Feeding Questionnaire (Baughcum et al., 2001).

#### 2.2.3. Caregivers’ depressive symptoms

Caregivers’ depressive symptoms were measured using the Patient Health Questionnaire (PHQ-9), which is a nine-item self-reporting measure used to screen depressive disorders, and has been validated in Ethiopia (Gelaye et al., 2013). The items asked whether caregivers had experienced depressive symptoms Over the last 2 weeks, with response categories of 0 “not at all”, 1 “several days”, 2 “more than half the days”, and 3 “nearly every day”.

#### 2.2.4. Children’s mental health status

The children’s mental health status was assessed using the Strengths and Difficulties Questionnaire (SDQ), more specifically the parent or caregiver report version (SDQ-P). It measures both mental health difficulties and competencies. It is also known that SDQ can be used as a genuinely dimensional measure of child mental health, since it has been validated against the prevalence of clinical disorders (Goodman & Goodman, 2009). The tool consists of 25-items that are rated on a 3-point Likert scale (not true, somewhat true, and certainly true) with five sub-scales, which are emotional symptoms, conduct problems, hyperactivity-inattention, peer problems and pro-social behaviour. The total difficulties score was generated by summing the scores for all the scales except the pro social scale.

#### 2.2.5. Anthropometric measurements

Anthropometric measurements were taken to compute the children’s BMI. Weight was measured to the nearest 0.1 kg using an electronic portable scale (Seca) and height was measured in the standing position to the nearest 0.1 cm using a portable locally made stadiometer. We conducted an anthropometric measurement (weight and height) standardisation exercise among selected children and calculated the intra- and inter-observer technical errors of measurement (TEM). The intra-observer technical error of measurement for height was found to be 0.19 and for weight 0.12. The inter-observer technical error of measurement for height was found to be 0.21 and for weight 0.21. The coefficient of reliability was 97.5%. All the measurements were found to be within an acceptable range.

#### 2.2.6. Demographic and socioeconomic characteristics

The children’s sex and age (in completed years) were obtained. The caregivers’ education levels were measured using a scale of 1) no formal education, 2) primary education, 3) secondary education, 4) technical school and above. Socioeconomic status was measured by asking caregivers’ household’s fixed asset ownership such as some commodities and housing conditions which includes questions such as roof over their head and water source. For both a score of “1” was given to those who own/have and score of “0” was given to those who did not. All items asked were then assessed for internal consistency to transfer the asset and housing condition information into latent factors and the first PCA explaining most of the variation based on the objective of the study was taken as a health score.

#### 2.3. Data management and analysis

We used the Stata version 15.0 statistical software package for data cleaning and analysis. All variables with missing data were first recorded and appropriate handling method was used during analysis. For multiple linear regression, assumptions of normality, linearity, homoscedasticity, multicollinearity and outliers was assessed. All the variables met the above assumptions except for children’s emotional overeating scale which showed positive skewness and was corrected using logarithmic transformation. Descriptive data were presented using frequency, percentage and mean with standard deviation. All the analyses performed were pre-specified and based on the study objective.

The World Health Organization’s (WHO, 2015) 2007 growth reference was used as a standard reference for classifying preschool children’s BMI using the WHO, 2015 Anthro Plus software version 1.0.21. Using the BMI-for-age cut-offs, severe thinness was determined as being less than 3; thin between 3 and 2; and normal between 2 and +1. Overweight was determined as being between +1 and +2 and obese as greater than +2.

A relative socioeconomic status was derived for the study households using a principal component analysis (PCA). Households were then categorised into quintiles ranging from the poorest to the richest. Caregivers’ depression status was assessed using the standard total PHQ-9 score, which was then divided into three categories: (i) no depression, (ii) mild depression, and (iii) moderate depression. The children’s mental health status was categorised using the standard SDQ parents’/caregivers’ version categorisation of total difficulties scores. The resultant score was divided into four groups: (i) close to average, (ii) slightly raised, (iii) high, and (iv) very high.
Each scale was generated by calculating the mean of the items, and subsequently expressed them as mean and standard deviations. A higher scale score represents greater concern, more frequent use of a feeding strategy, or higher levels of engaging in a particular eating style. We calculated Cronbach’s alpha (α) to test the internal reliability of each subscale in both the CEBQ and the CFQ.

We also fitted eight separate multiple linear regression models to determine the association between caregivers’ feeding practices and each scale of children’s eating behaviour that accounted for other variables. In all cases, statistical significance was set at a p-value of <.05.

### 3. Results

In total, 525 of the 542 caregivers we approached participated in the study, representing a response rate of 96.8%. A total of 17 caregiver–child dyads were not included in the study because 14 of the caregivers did not have adequate time to be interviewed, and three of the children were unwilling to remove their shoes or other clothing during the anthropometric measurements. The sociodemographic characteristics of caregiver–child dyads are presented in Table 1. Most of the respondents (92.2%) were the mother of the index child, and 63.7% of the respondents had secondary education or higher. The mean age of the children was 4.5 years (±SD = 0.04).

We found that 76.9% (404) of the children had acceptable BMI-for-age scores. However, 12.9% (68) children were overweight and 4.1% (Berhane et al., 2018) were obese. Our findings also showed that 4.1% (Berhane et al., 2018) and 1.7% (Roy et al., 2020) children were thin and severely thin, respectively. The majority of the caregivers (57.1%) had no depression symptoms, while 15.2% (80) of the caregivers had moderate depression. We also found that the majority of the children (60.3%) scored close to average while 15.4% (81) scored very high on the SDQ-p total difficulties score (see Table 1).

A descriptive summary of the CEBQ subscales is presented in Table 2. Most of the subscales scored close to the midpoint (2.5); however, emotional overeating (mean: 1.31, SD: 0.59) and slowness in eating (mean: 3.47, SD: 0.86) mark the opposite extremes of the spectrum. The internal reliability (Cronbach’s alpha) for each subscale of the CEBQ ranged from 0.50 to 0.79. Most of the subscales were under the acceptable range (< 0.70), except for food responsiveness and slowness in eating.

Table 3 shows the mean scores of the seven-scale CFQ and concern about child underweight scale taken from PFQ. Among the feeding practices, monitoring practice had the highest mean score of 4.13 (SD: 1.02) indicating that caregivers do keep track of what their child eats most of the time, while restriction had the lowest score of 3.47 (SD: 0.91). This shows that caregivers slightly agreed with the practice to restrict the intake of some types of food by their children. In addition, perceived feeding responsibility had the highest score of all the scales (Mean: 4.47, SD: 0.80). Regarding the Perceived caregivers’ weight factor (Mean: 3.01, SD: 0.47) and the Perceived child weight factor (Mean: 3.05, SD: 0.56), caregivers reported normal weight from childhood up to the present moment for themselves and for their children. These scores also likely reflect the fact that 76.9% of the sample of children have a healthy weight status, and so over/underweight concern is less likely to be so prevalent in these caregivers. This is evidenced by the low scores on concern about child overweight (2.92, SD:1.16) and underweight (2.42, SD:1.35). These caregivers don’t have a unique focus on concern about child’s nutritional status as much as they have on feeding responsibility. In addition, the internal reliability (Cronbach’s alpha) for each subscale of the CFQ ranged from 0.61 to 0.89.

In Table 4, we present a separate multivariate linear regression model fitted to determine the relationship between the scales of children’s eating behaviour and of caregivers’ feeding practice. This accounts for sociodemographic characteristics, caregivers’ depression status, children’s mental health status, caregivers’ perceived feeding responsibility, caregivers perceived own and child weight, and concern about child underweight or overweight.

#### 3.1. Food approach behaviours, caregivers’ food restriction and caregivers’ pressure to eat

We found a positive and significant association between caregivers’ food restriction practices and the four food approach behaviours: enjoyment of food (β = .22, p < .001), food responsiveness (β = .22, p < .001), emotional overeating (β = 0.08, p < .05) and desire to drink (β = 0.26, p < .001). Moreover, we found a negative but significant association between caregivers’ practice of pressure to eat and three of the food approach behaviours: enjoyment of food (β = -0.11, p < .001), food responsiveness (β = -0.08, p < .001) and emotional overeating of food (β = -0.11, p < .001) (see Table 4).

| Variables | N | % | Mean (SD) |
|---|---|---|---|
| Child’s age (in year) | | | 4.5 (.04) |
| Child’s sex | | | |
| Male | 247 | 47 |
| Female | 278 | 53 |
| Caregivers’ relation to the child | | | |
| Mother | 484 | 92.2 |
| Father | 14 | 2.7 |
| Nanny | 10 | 1.9 |
| Other | 17 | 3.2 |
| Caregivers’ educational status | | | |
| No formal education | 59 | 11.2 |
| Primary education | 131 | 24.9 |
| Secondary education | 183 | 34.8 |
| Technical school and above | 152 | 28.9 |
| Wealth index | | | |
| Poorest | 105 | 20.1 |
| Poor | 104 | 19.9 |
| Medium | 104 | 19.9 |
| Wealthy | 104 | 19.9 |
| Wealthiest | 104 | 19.9 |
| Type of preschool | | | |
| Private/missionary/church | 389 | 74.1 |
| Government/public | 136 | 25.9 |
| Child’s BMI | | | |
| Severely thin | 9 | 1.7 |
| Thin | 22 | 4.1 |
| Normal weight | 404 | 76.9 |
| Overweight | 68 | 12.9 |
| Obese | 22 | 4.1 |
| Caregivers’ depression status | | | |
| No depression | 300 | 57.1 |
| Mild depression | 145 | 27.6 |
| Moderate depression | 80 | 15.2 |
| Child’s mental health status | | | |
| Close to average | 317 | 60.3 |
| Slightly raised | 78 | 14.8 |
| High | 49 | 9.3 |
| Very high | 81 | 15.4 |

| Table 2 | Mean (SD) scores of components of children’s eating behaviour in Addis Ababa, Ethiopia. |
|---|---|---|
| Components | Mean (SD) Cronbach’s alpha |
| Children’s eating behaviour | | |
| Enjoyment of food | 3.09 (.99) | .75 |
| Food responsiveness | 2.05 (.80) | .56 |
| Desire to drink | 3.28 (1.08) | .77 |
| Emotional overeating | 1.31 (.59) | .79 |
| Slowness in eating | 3.47 (.86) | .70 |
| Emotional undereating | 2.80 (1.02) | .71 |
| Food fussiness | 2.48 (.73) | .71 |
| Satiety responsiveness | 3.25 (.83) | .72 |


Table 3
Mean scale scores from the CFQ and one scale score from PFQ in Addis Ababa, Ethiopia.

| Variables                               | Mean  | SD   | Cronbach’s alpha |
|-----------------------------------------|-------|------|------------------|
| Perceived feeding responsibility       | 4.47  | .80  | .83              |
| Perceived caregivers’ weight            | 3.01  | .47  | .76              |
| Perceived child weight                  | 3.05  | .56  | .89              |
| Concern about child overweight         | 2.92  | 1.16 | .61              |
| Concern about child underweight        | 2.42  | 1.35 | .64              |
| Restriction                             | 3.47  | .91  | .74              |
| Pressure to eat                         | 4.02  | .99  | .71              |
| Monitoring                              | 4.13  | 1.02 | .84              |

* Concern about child overweight is taken from pre-schooler feeding questionnaire.

3.2. Food avoidant behaviours, caregivers’ food restriction and caregivers’ pressure to eat

We found a negative and significant association between caregivers’ food restriction practices with food fussiness ($\beta = -0.13, p < .001$), but a positive and significant association with emotional undereating ($\beta = 0.10, p < .05$). Moreover, we found a positive and significant association between caregivers’ practice of pressure to eat and three of the food avoidant behaviours: food fussiness ($\beta = 0.10, p < .001$), satiety responsiveness ($\beta = 0.14, p < .001$) and slowness in eating ($\beta = 0.12, p < .001$). (see Table 4).

3.3. Eating behaviours and caregivers’ monitoring

The caregivers’ practice of monitoring was not found to be significantly associated with any of the eating behaviour scales (see Table 4).

4. Discussion

The main aim of this study was to examine the association between caregivers’ feeding practices and children’s eating behaviours among preschool-aged children in Ethiopia. This study showed that food approach behaviours were positively associated with the caregivers’ practice of food restriction but were negatively associated with caregivers’ practice of pressure to eat. Furthermore, food avoidant behaviours had a positive association with caregivers’ practice of pressure to eat while the food fussiness scale had a negative association with caregivers’ practice of restriction.

Food approach behaviours including enjoyment of food, food responsiveness, emotional overeating and desire to drink had positive associations with caregivers’ practice of food restriction. This finding was consistent with various findings from developed countries (Gregory et al., 2010a; Jansen et al., 2012; Webber et al., 2010). For instance, a Norwegian cohort study found that more restrictive feeding practices (use of food as a reward) predict increased food-approaching behaviours such as enjoyment of food and emotional overeating (Steinsbekk et al., 2016). Another study revealed that a restrictive feeding practice was positively correlated with food responsiveness (Gregory et al., 2010a). This may reflect an increase in the child’s desire to eat a food item mainly because it is forbidden. Restricting access to a palatable food item increases the child’s intake, comments and requests for that food (Rollins et al., 2014). As a result, children learn to respond to food cues rather than to internal cues of hunger and satiety.

In Ethiopia, increasing urbanisation is contributing to more consumption of saturated fats, sugary beverages, processed meats, cholesterol and sodium (Imamura et al., 2015), and caregivers are now beginning to understand that these “unhealthy” foods are not good for their children (Berhane et al., 2018). Consequently, caregivers tend to adopt more restrictive feeding practices. Such feeding practices may also be one of the factors for the high prevalence of overweight and obesity that has been recently documented in preschool children in Addis Ababa, Ethiopia (Berhane et al., 2020). However, given the cross-sectional nature of this study bidirectional relationship is plausible. It is possible that due to this increased urbanisation and obesogenic environment, children will more likely develop or persist highly obesogenic eating behaviour further contributing to children’s overweight and obesity. Therefore, caregivers in response may feel the need to restrict the child’s intake of unhealthy food.

Another main finding is that caregivers practiced less restriction with children who showed food fussiness behaviour. This is in line with a UK study where fussy eating was found to have a significant negative association with restriction, and fussier children were less restricted in their intake of foods that are high in sugar and fat (Harris et al., 2016). On the other hand, findings from systematic reviews revealed that higher levels of restriction were used with children who were fussier, perhaps because fussier children are perceived to have a more limited diet and to more readily consume energy-dense foods (Samuel et al., 2018; Scaglioni et al., 2018). It could also be the case that caregivers impose restrictions on energy-dense foods in an attempt to encourage consumption of rejected foods (Scaglioni et al., 2018). In particular, the unavailability of restricted foods may appear to be more attractive to children, leading to overconsumption when these foods become freely available. It is equally possible that the caregivers of children with highly obesogenic eating behaviour feel the need to restrict the child’s intake of unhealthy food.

Our findings also revealed that the food avoidant behaviours – food fussiness, satiety responsiveness and slowness in eating – have a positive association with caregivers’ practice of pressure to eat. This finding is consistent with studies conducted in the UK and Nigeria, where maternal reports of pressuring children to consume more food at mealtimes were associated with food avoidance eating behaviours, i.e., slowness in eating, satiety responsiveness and picky eating (Powell et al., 2011; Uwaezuoke et al., 2016). An Australian prospective study,
However, found no relationship between pressure to eat and food fussiness (Gregory et al., 2010a). Children who are forced to consume certain foods develop a “cognitive aversion” to those foods because they associate them with a negative feeding experience (Batsell & Brown, 1998). The cognitive aversion may also apply to the general experience of trying new foods (Gregory et al., 2010a). Caregivers’ pressure to eat has also been associated with lower levels of intuitive eating and higher levels of disordered eating behaviours in young adults (Ellis et al., 2016).

In low-income countries, undernutrition and food scarcity have been major threats to children’s survival, and caregivers’ feeding practice has evolved in response to these threats (Birch et al., 2007). Pressure to eat feeding practices, such as providing large portions of food and encouraging children to eat, are still dominant in most cultures, including the study area, and therefore make more caregivers inclined to force their child to eat. This may also be the reason for the low score on the emotional overeating scale, since caregivers find it difficult to distinguish between whether the child has emotional overeating or has a “big appetite” and is meeting his/her biological needs.

Furthermore, we found that food approach behaviours – enjoyment of food, food responsiveness and emotional overeating – are negatively associated with caregivers’ practice of pressure to eat. This finding is consistent with a study conducted in Dubai, where children of caregivers who used pressure were less likely to have food responsiveness and enjoyment of food (Yekani et al., 2013). This was also evidenced by another study conducted in the Netherlands, where the practice of pressuring the child to eat and enjoyment of food were negatively correlated (Jansen et al., 2012). In general, the caregivers of children who enjoyed food less and were fussier or ate more slowly were found to be more likely to have used pressure strategies to feed their child (Webber et al., 2010). A bidirectional relationship is possible, as caregivers may pressure their child to eat more in response to the child’s avoidant eating behaviour (Powell et al., 2011) or due to concerns about the child not eating enough and not getting a healthy balanced diet (Kwon et al., 2017). On the other hand, pressuring strategies may be responsible for the development and persistence of these problems.

Studies have shown that monitoring is a desirable feeding practice which has been positively associated with healthier outcomes, such as lower consumption of sweet drinks and more consumption of fruits and vegetables, and negatively associated with unhealthy eating (Haszard et al., 2015; Mais et al., 2017). This might be one of the reasons for witnessing a lack of significant association between caregivers’ practice of monitoring and any of the eating behaviour scales in this study. Therefore, monitoring practice relation with these dimensions of non-clinical but still problematic eating behaviors might be unlikely. This finding was similar to an Australia study where a significant longitudinal relationship between maternal use of monitoring and children eating behaviour (i.e. food responsiveness) was not found (Gregory et al., 2010a).

The present study has major strengths, including (a) the incorporation of eight dimensions of eating styles, which helped assess the association with caregivers’ practice in a wider scope; (b) having an adequate sample size with the use of probability sampling techniques, which helps to generalize; and (c) the use of standardisation protocols for anthropometric measurements, which helps to find accurate and precise anthropometrical measurement and to reduce errors.

There are, however, limitations to our study that should be considered. First, the small sample size of the study hinders the inference of causal conclusions between children’s eating behaviour and caregivers’ feeding practices. Second, the measures were based on the caregivers’ self-reporting rather than on direct observation of caregivers’ feeding practices and children’s eating behaviours. For this reason, the subjective introduction of bias cannot be ruled out. Caregivers may not be able to accurately estimate the degree to which their child’s eating behaviour deviates from typical child eating behaviours, or their perception of their child’s eating behaviour might be biased by their own concerns about eating and feeding behaviours. Although there are many advantages to employing observations and laboratory tests instead of questionnaires, these techniques are not cost-effective, especially in population studies such as the present one. Future research may prefer to use observational methodology in naturalistic settings such as the home environment, as this would enhance our understanding of the associations between caregivers’ feeding practices and children’s eating behaviours. Third, the CEBQ and CFQ are not validated in this study area. This may jeopardise the tools’ ability to accurately assess what they are intended to measure. This might be one of the reasons for the observed low Cronbach alpha in food responsiveness and slowness in eating scale. Applicability at a population level, and sensitivity to cultural difference should be checked when using any measurement method. For instance, a study conducted in China indicated that the CEBQ in its original form may not be culturally appropriate for non-western populations and proposed an alternative 19-item version of the tool (Cao et al., 2012). However, these tools have been validated in similar settings (Lorenzato et al., 2017; Purwaningrum et al., 2020; Viana & Sinde, 2008), and we have also minimised the effect by performing face validity and internal reliability (Cronbach’s alpha) tests on a sample of caregivers before using the measurement scales. Although study specific questionnaires were more easily understood and applicable to the cultural settings studied, it is important to note the following justifications for using a pre-existing questionnaire: i) the questions would have already been tested at the time they were first used, thus other researchers could, like us, be fairly confident that they were good indicators of their concepts of interest; ii) it saves both money and time on developing a new questionnaire; and iii) these questionnaires are well validated, reliable and used by different studies worldwide, therefore, making comparability with international studies easier and more achievable.

5. Conclusion

This is the first study to document the association between caregivers’ feeding practices and children’s eating behaviours in the context of developing countries such as Ethiopia. Children whose caregivers practice food restriction tended to be more food responsive, tend to emotionally overeat, enjoy food more and have more desire to drink when their caregivers practiced food restriction. Meanwhile, children whose caregivers practiced pressure to eat were fussier about food, were more satiety responsive and tended to eat slower. The results from this study underscore the importance of investigating eating behaviours at an early age because these eating styles may contribute to poor nutritional status. This might imply particularly for countries like Ethiopia, where the co-existence of both under- and over-nutrition is evident among pre-schoolers. It is essential to include appropriate child eating behaviour and specific feeding practices component, together with responsive feeding in national nutritional programmes to improve the nutritional status of children aged 24–59 months. In addition, reinforcing the use of responsive feeding practices in nutrition education provided by the health extension system will help parents and other caregivers develop awareness about the different dimensions of eating behaviours in young children and to practice appropriate feeding practice to overcome eating problems. To further our understanding of the complex relations between children’s eating behaviours and caregivers’ feeding practices, future research would benefit from longitudinal research designs.

Ethical statement

The study was ethically approved by Addis Ababa University Institutional Review Board with a project number 0011.

The study included an information sheet which explained the main purpose, method and possible outcomes as well as demands and risks of the study. A written informed consent was obtained from the parents/
caregivers for participation and publication of the study. The consent form clearly stated that participants were volunteers and can be part of the study without being coerced and they also had the right to withdraw at any stage of the study. It also ensured participants protection of their anonymity and confidentiality of their personal information.

The results reported in this study are derived from honest data and procedures with careful unbiased assessment and caused no harm to the participants. And we will be open to sharing any kind of data or results to the public.

Those mothers who were found to have severe depression and children with high and very high total difficulty score were linked with Addis Ababa University, College of Health Science and Medicine, Psychiatry Department for further clinical evaluations.

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Declaration of competing interest

The authors declare that they have no competing interests regarding the publication of this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.appet.2020.104992.

Authors’ contributions

NW, SHG, RH, EH and DSA designed the study. NW collected and analysed the data and drafted the manuscript. All the authors contributed to analysing and assessing the findings. All the authors contributed substantially to drafting the manuscript. They also critically revised and approved the final manuscript.

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