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Is Parenting Style and Sociodemographic Status of Parents Related to Children's Healthy Eating Activity in a Multicultural Society Like Mauritius?

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ABSTRACT

Paediatric nutrition is of growing concern in many countries with regards to the escalating number of childhood obesity. This study endeavours to (i) Determine how parental style is related to healthy eating habits in children, (ii) Establish any relationship between the sociodemographic status of the parents and healthy eating and to (iii) Collect views following school canteen Regulation 2009 in Mauritius. A cross-sectional survey was carried out in Mauritius, whereby questionnaires were distributed to mothers of children aged 2-11 years (n = 289). Information collected were mother's demographic background, monitoring, disciplining, controlling styles and a specific food frequency was also included. Data was analysed using Chi-Square test and Factor Analysis. Monitoring and disciplining styles were found to be significantly (p<0.05) related to healthy eating. Demographic variables enquired were found to be significantly (p<0.05) associated to healthy eating. Parents with high income were reported to be better off to provide a healthy nutrition to their ward. Children found to be eating healthily were those whose mothers were aged above 30 years and working as professionals. Moreover, urban dwellers were found to have a healthier eating activity compared to rural one. Most parents were satisfied with the new canteen regulation but mothers reported that their wards still buy junk foods from school neighbouring shops. Hence, results from the present study can be exploited as baseline data to address the nutrition education of Mauritian's children.

Key words: Parenting style, child nutrition, feeding practices, healthy eating activity, canteen regulations

INTRODUCTION

Paediatric obesity is becoming an alarming issue. Obesity defined as an imbalance between food consumed and physical activity, is not only about having excess weight but it is associated with a number of metabolic syndromes such as glucose intolerance, insulin resistance, hyperlipidemia and hypertension (Mamat *et al.*, 2012). Both genetic and environmental causes account for such an epidemic. Lack of activity, genetics, aggressive lobbying and advertising by the fast food industry, high and wide availability of energy-dense foods, increased portion size, change in eating style amongst others, are to be blamed (Paginini *et al.*, 2007). Children being dependent on their parents, cannot choose the environment in which they live or food that they eat (Guner *et al.*,

2009). Therefore, childhood is a vulnerable phase as children are unable to understand the long-term effects of unhealthy habits on health (WHO, 2011).

Statistics regarding childhood obesity from global health watchdogs reveal that epidemic proportions have been attained. According to the World Health Organisation (WHO, 2006a), the number of overweight children (< 5 years old) is estimated to be over 43 million; 1 in 10 children where approximately 35 million living in developing countries (WHO, 2006b), and more recently WHO revealed that at least 2.6 million people each year die as a result of being overweight or obese (WHO, 2011). The 2004 non-communicable diseases survey report showed that 8.1% of Mauritian children aged 5 to 11 years were obese and 7.7% were overweight (WHO, 2004). The increasing number of NCDs, such as diabetes, cardiovascular diseases and cancer, among the young population is of growing public health concern. Good nutrition at this very period is essential in the prevention of obesity and chronic diseases in adulthood (Gonzalez-Suarez *et al.*, 2009; Khositseth *et al.*, 2009). Therefore, given that parents are the primary caretakers of their wards, the study has endeavoured to investigate how parenting styles influenced healthy eating habits of their wards. Beside, establishing the links between socio-demographic profile, and eating habits was also attempted. Besides parenting style and socio demographic variable, foods available in school canteen is a major influencing factor of children nutrition. Thus the study collected views following the 2010 regulation regarding the sales of foods allowed in school canteen. Sales of unhealthy snacks such as 'chips', 'crisps', 'cracker', 'sugar dense beverages' amongst others were prohibited. These snacks are highly obesogenic and thus are one of the main causes of obesity (Gonzalez-Suarez *et al.*, 2012). The results are expected to provide baseline data for reorientation of actions by all stakeholders in discouraging unwanted eating habits.

MATERIALS AND METHODS

Sample size: Using data from the Statistics Mauritius (formerly the Central Statistical Office Mauritius), based on guidelines on sample size using statistical tables by Krejcie and Morgan (1970), a sample size of 384 was found to be representative of the 181,762 Mauritians between the ages of 2 and 11 (Ministry of Health and Quality of Life of Mauritius, 2009) with 95% confidence interval, $\pm 5\%$ precision level and degree of variability, $p = 0.5$.

Survey instrument: The survey was conducted using a questionnaire adapted from Arredondo *et al.* (2006). Socio-demographic status, food frequency and parenting style were the three major sections of the questionnaire. During the design process, the instrument was pre-tested using 20 volunteer parents. Feedback was recorded and the necessary amendments were made so that the elements of the questionnaire met the expectations of the multi-ethnic and multi-cultural realities of the population. The views of the volunteers and supervisors were crucial in this process. The five pages questionnaire took ten minutes to fill and it was administered with the help of a trained research assistant.

Data collection: The target population was reached in public places where there is convergence of multi-ethnic individuals of different backgrounds (shopping centres and socio-cultural events). Additional parents were reached in the nine districts of the island. The questionnaires were handed out randomly to mothers of children aged between 2 and 11 years old. This age range was as chosen as it was found to be crucial when developing eating habits among children (Khositseth *et al.*, 2009). The study began in September 2010 and was completed over a period of nine months.

Inclusion criteria: Mothers only were approached to fill in the questionnaire as according to the observations of Shuhaimi and Muniandy (2012) children strongly associated their food intake to that of their mothers rather than fathers. Moreover, in most cases, mothers were the caretaker of their children and thus they were better off to provide information about the child diet. The term “parent” was used interchangeably with “mother” in this research.

Data analysis: The software SPSS (version 17.0) was used to conduct appropriate statistical tests namely Factor Analysis and Chi-Square (χ^2) test. In this study, Factor Analysis has been carried out in order to identify any possible latent factors behind parental style that affect children’s eating activity. The chi-square test was used to establish whether two categorical variables were independent or not.

RESULTS

A Factor Analysis was performed to identify which components of parental style significantly influenced the children’s eating pattern. Seven major factors were extracted as shown in Table 1.

Table 1: Principal axis factoring -rotated factor matrix^a

Questions	Factor						
	1	2	3	4	5	6	7
Controlling children							
Insist he finishes everything	0.713	0.027	0.225	0.010	0.099	0.102	-0.118
My child always finishes his meal	0.573	0.052	0.001	0.195	0.122	-0.063	0.132
Discourage eating in front of TV	0.463	0.285	0.177	0.080	0.286	-0.143	0.015
I am concerned about what my child eats	0.450	0.121	0.330	0.140	0.089	-0.262	-0.031
Monitoring children to eat healthily							
Encourage to eat more dairy	0.024	0.823	0.085	0.159	-0.030	0.031	0.055
Tell to eat at least 2 portions of fruits	0.152	0.545	0.052	0.365	0.242	0.219	-0.041
I make sure my child have 5 servings fruits	0.314	0.471	0.152	0.062	0.074	-0.080	0.442
Giving fruits carrot sticks	0.131	0.432	0.288	0.237	0.324	0.018	0.260
Insist they eat all vegetables and fruits	0.275	0.335	0.284	-0.240	-0.266	0.020	-0.174
Limiting unhealthy foods and reward							
Limit packed snacks	0.104	0.581	0.208	0.142	-0.057	0.080	
Limit amount of fizzy drinks	0.027	0.161	0.530	0.168	0.182	0.032	-0.191
Not giving sweets as reward	0.238	-0.008	0.415	-0.022	0.142	0.043	-0.037
Praise child for healthy eating	0.411	0.224	0.414	0.178	0.029	-0.009	0.087
Discouraging unhealthy habits							
Discourage eating from outside	0.072	0.218	0.229	0.588	-0.011	0.000	-0.028
Discourage drinking soft drinks	-0.029	0.255	0.293	0.573	0.022	0.244	-0.068
Discourage eating snacks	0.166	0.005	-0.009	0.475	0.091	0.064	0.022
Restricting unhealthy food							
Limit amount of sugary beverages	0.045	-0.048	0.292	0.060	0.709	0.010	-0.066
Restrict the amount of fatty foods	0.313	0.186	0.101	0.051	0.655	0.058	-0.082
Regulating quantity and quality of foods							
Sweets and candies are unhealthy	0.089	0.058	0.116	0.121	-0.036	0.583	0.162
I do not regulate my child eating quantity	-0.187	0.017	-0.097	0.061	0.082	0.295	-0.002
Strict parental control							
Children diet should be monitored	0.359	0.098	0.307	0.233	-0.161	0.163	0.387
Get child to eat even though he is not hungry	-0.019	0.006	-0.037	-0.022	-0.019	0.036	0.142

Extraction method: Principal axis factoring, Rotation method: Varimax with kaiser normalization, ^aRotation converged in 9 iterations

Table 2: Socio-demographic hypotheses of healthy eating (HE)

Hypotheses (H ₀)	Chi-square value	p-value
HE is independent of		
Age group of parent	33.19	<0.05
Parent education	75.26	<0.05
Ethnic group	52.49	<0.05
Occupation of parent	101.47	<0.05
Marital status of parent	94.36	<0.05
Household income	123.71	<0.05
Place of residence	14.13	<0.05

All the statements were grouped in order of importance under the following headings or descriptions: 1. Controlling children, 2. Monitoring children to eat healthily, 3. Limiting unhealthy food and reward, 4. Discouraging unhealthy habits, 5. Restricting unhealthy foods, 6. Regulating quality and quantity of foods, 7. Strict parental control. In the light of the findings, it can be observed that the components with the highest factor loading were those which were the most influential, namely, "Controlling children".

Based on the extracted and summarised factors in Table 1, we were able to observe which variable had higher positive influence on children healthy eating activity. Controlling (0.450-0.713), monitoring (0.335-0.823) and limiting unhealthy foods (0.414-0.581) were among the most influential variables. It is worth noting that strict parental control whereby children were forced to adapt a certain healthy eating behaviour did not result in healthy eating in the latter. Parents who exhibited characteristics like verbal praising, increase the availability of healthy foods were found to have children eating healthily.

With regards to the relationship between parental socio-demographic factors with children healthy eating activity, a cross-tabulation was used to observe frequencies common to two variables across their attributes. Seven hypotheses involving demographic variables with respect to healthy habits of children were tested. The Chi-Square test of independence has been considered to be the most appropriate here since all the variables involved have been measured on an ordinal or nominal scale. Five items namely 'Milk', 'Dairy products', 'Whole grain cereals', 'Vegetables' and 'Fruits' will be treated as a 'Set' before cross-tabulating the frequencies in SPSS as Healthy Eating (HE). Table 2 summarises the outcomes of the testing of the seven above-mentioned hypotheses.

As observed in Table 2, all the p values were found to be less than 0.05 and hence a significant relationship was observed. Therefore, it can be said that there were significant relationships between healthy eating of children and the socio-demographic variables. Regarding the views on new regulations for sales of food on school premises, 85.5% were happy with this initiative and stated that these will allow for better control on what their children are eating. However, parents who said were not satisfied with the initiative found that these will not affect their children's habits, given that the latter still buy the prohibited foods outside school premises.

DISCUSSION

One of the primary goals of this study was to determine how parenting styles influence children healthy eating activity in Mauritius. The findings of the present study tend to indicate that parental disciplining and monitoring lead to healthy eating activity in children aged 2-11 years. The Factor Analysis has allowed the identification of prominent factors influencing healthy eating in children. One of the major findings was that parental discipline and monitoring were highly positive in influencing children healthy eating. Disciplining styles like 'Insisting child finishes

everything in the plate' (0.713), 'Discouraging eating in front of television' (0.463), 'Concerns about what child is eating (0.450) and 'Encouraging to eat more dairy products' (0.823) were also found to be important in respondents' children. Our findings were similar to Arredondo *et al.* (2006). It was found that coupling disciplining style with limiting unhealthy foods (an authoritative approach) was related to healthy eating in children with an α -value of 0.76. On one hand, parents were seen to limit the sugar dense soft drinks while on the other hand were very liberal when it comes to fruit juices. Studies have shown that soft drinks are more obesogenic as compared to fruit juice (Tam *et al.*, 2006). Moreover, parents who discouraged eating in front of TV were positively related to healthy eating in their ward. It is of major significance as television viewing has been related to obesogenic behaviours (Gorthmaker *et al.*, 1996; Veghari and Golalipour, 2007), where people who tend to eat more while television viewing-termed as unconscious eating. Therefore, it is highly recommended that parents encourage eating meals at table with the family, whereby wellness communication can occur. In addition to this, unhealthy food advertisement viewed during mealtime influence the eating habit of children.

Utter *et al.* (2006) have shown that children consuming unhealthy foods like fizzy drink and sweets more frequently are those who are more exposed to television adverts. The same study revealed that breaking barriers such as unavailability of healthy foods and limiting the amount of unhealthy foods resulted in healthy eating in children. Parents who were involved in activities such as 'giving fruits and carrots sticks as snacks', 'insisting that child eats all fruits and vegetables' and 'encourage their wards to eat more dairy products' have children who consume healthy foods. Even non-verbal disciplining like 'telling to eat at least two portions of fruits' resulted in healthy eating.

However, strict parental control was among the least influential factor. Applying strict and rigid control in children resulting in unhealthy eating habit has also been reported by Arredondo *et al.* (2006). According to Birch and Fisher (1998), 'High levels of control in the parenting style are reported to be associated often with the child's inability to adhere to internal signals of satiation, and therefore the child is more likely to eat restricted (generally unhealthy) foods in the absence of hunger.' Our findings also support this statement as it was found that parents who highly agreed that 'children should be strictly monitored' (0.387) and 'forcing children to eat even though not hungry' (0.142) had children who ate less healthily. Therefore strict controlling practice must be discouraged by parents. Moreover, permissive attitude like not regulating or monitoring were least influential when it comes to healthy eating habits. Even De-Bourdeauhui (1997) and Kremers *et al.* (2003) reported that a permissive family had children consuming more unhealthy foods.

The majority of earlier studies (Kremers *et al.*, 2003; Rhee, 2008; Wadolowska *et al.*, 2007) have compared only parental style with relation to healthy eating activity. Limited studies have been done, whereby sociodemographic of the subjects (parents and children) with relation to healthy eating have been investigated. Surprisingly, not only household income were associated with healthy eating but all the sociodemographic parameters that is age group, education level, ethnic group, occupation, marital status. The next section outlines the outcomes of hypothesis testing of socio-demographic profiles and healthy eating.

Household income: Parents who earned more were found to have children exhibiting healthy eating behaviours. In addition, WHO perceives socio economic status as a major determinant of healthy eating in children. That is, children from poor background have difficulty in accessing

healthy eating choices (WHO, 2009). According to Booth and Smith (2001), parents tend to experience a variety of pressures such as low financial problem which can contribute to poor eating habits in children (Deakins University, 2005). This was to be expected because not only these parents have a higher level of awareness of the child obesity problem but they also have the means to take care of it. Less well-off parents seem to be unable to afford to give maximum health care to their children, as much as they would have wanted to. Raver *et al.* (1999) stressed that low income restricts food choices and food quality because healthier food is generally expensive. Family income has a direct effect on healthy eating of family members (Power, 2005). Thus, we can deduce that low incomes coupled with low cost of calorie dense foods contribute to unhealthy eating habits among children.

Education level of mothers and occupation status: Both education level and occupation status have seen to be significantly related ($p < 0.05$) to healthy eating habits in children in this study. Our findings were similar to a cross-section study carried in Spain, where Aranceta *et al.* (2003) found that children with mother of low education level were less likely to follow a healthy eating pattern. Mauritian mothers whose occupation was of professional nature was associated with healthier eating in their children. Similar findings were seen in a Malaysian study, whereby mother's employment and healthy eating patterns in their wards were linked (Adnan and Muniandy, 2012). Logically, the high income of professionals may be a plausible explanation of why children whose mother worked as professionals ate healthier. Golan and Crow (2004) who reported that higher the SES, the greater the improvement in obesogenic behaviours ($r = 0.4$; $p < 0.05$) supports our study findings. However, Mauritian mothers working in the 'service sector' were reported to be too lenient. They allow their children to bypass healthy eating habits a lot more often. Therefore, this leniency may be attributed to time (due to long shift hours of service workers) maybe a major factor influencing the provision of healthy options to children.

Marital status: Various studies have shown the impact of single parent family on behaviour of children. Data from the present study is similar to previous findings (Vereecken *et al.*, 2004). Single parents find it very hard to monitor their children and encourage them to practice healthy eating habits. This would seem quite logical since, with married parents, there are at least two people to monitor the children. With domestic and personal commitments, it is quite hard to take very good care of children as far as single parents are concerned.

Place of residence: Both urban and rural areas are complex and diverse in Mauritius. Findings from the present study unexpectedly, revealed that children from rural areas indulged more in healthy eating compared to their rural counterpart ($p = .0069$). Controversially, good economic status in urban area leads to a higher risk to obesity in Iranian children (Veghari, 2011) with a logistic regression of 1.382 for urban and 2.297 for rural (CI 95%). Our findings were similar to American authors who reported that urban dwellers are more healthy eaters than rural American (Monge-Rojas *et al.*, 2005). This difference was due to the affordability of healthy foods for urban dwellers. Mauritius being a tropical island has a high availability of fruits and vegetables, more precisely in the rural areas. Despite the high availability of these foods to the rural parents, it could be noted that children do not eat healthily. Both rural and urban parents failed to keep up to the five a day policy. Whether, this phenomenon is associated with a problem of awareness about healthy eating or not needs to be confirmed with further research. On overall, it can thus be

concluded that sociodemographic status of mothers do have an influence on healthy eating in children, that is, some sociodemographic variables are interlinked. However, it could be seen that socio-economic status was indeed a major determinant of healthy eating in children.

Another aim of the study was to collect views following the school canteen regulation and it was encouraging to note that the majority of parents were highly satisfied with this initiative. On the other hand, a considerable proportion of parents expressed their negative feelings, being unhappy about the fact that the foods sold were still not healthy. They justified their response by saying that foods sold presently, are still fattening and un-hygienically handled. Since, foods sold in school canteen have a significant role to play in ensuring healthy eating among children (Glasgow *et al.*, 2004) the need for improvement in handling practices among Mauritian canteen holders (Subratty *et al.*, 2003) is highly needed. The aim of reviewing foods to be sold in school canteens was to eventually decrease the consumption of unhealthy snacks (sweets and high fat and high salty snacks). Several studies (Hearns *et al.*, 1998; Kremers *et al.*, 2003; Kubik *et al.*, 2003; Glasgow *et al.*, 2004; Morales *et al.*, 2008) have shown that it is possible to improve foods available in canteens and increase the sale of healthy items and decrease the availability of unhealthy snacks. However, it was reported by parents that children themselves were buying prohibited foods from outside school premises. Thus it can be said that the regulation decreased availability of unhealthy foods but the choice available presently is not appealing for the children as they are buying the prohibited foods outside premises. Thus the need for sensitising school children about healthy eating is important.

CONCLUSION

Mauritian parents were evaluated as having great concern about their child nutrition. However, those exhibiting authoritarian characteristics like applying too much pressure were negatively linked to healthy eating in their wards. Parents should be encouraged to promote healthy eating verbally and also by adopting appropriate discipline style like encouraging to eat more healthy foods and breaking barriers such as unavailability of healthy foods. With regards to new school canteen regulation, the initiative has lead to a decrease in the availability unhealthy foods among children but no increase in healthy foods consumption was reported. Parents should educate their child on healthy eating which will help them make wise choice with the pocket money given. Demographic status was highly related to healthy eating in children. High income earners were better off to access healthy foods. Children from urban areas had healthier diet compared to their rural counterpart. Thus it can be concluded that rural, non-single mothers who earned high income and aged above thirty years had children who were more indulge in healthy eating.

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