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Junk Food Consumption Behavior among Young Children

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ABSTRACT

Background: Consumption of junk food degrades the health status of people and is associated with low consumption of nutritious foods, which are essential for physical and mental growth. This study was carried out to find out the junk food consumption and its associated factors among young children.

Methods: A cross-sectional study was conducted among 352 school going children aged 5 to 9 years in Pokhara Metropolitan. Face to face interviews were done with one of the parents of the selected children with the help of a structured questionnaire. The study was done from March to October, 2020. Three or more consumption per week was categorized as high consumption of junk food. A descriptive and multivariate statistical analysis was performed. All inferential analyses were conducted at a 5% level of significance. Ethical approval was taken from the Nepal Health Research Council.

Results: Among the study participants, 70.7% consumed junk food three or more times per week; 66.5% energy dense food, 20.7% consumed noodles; and 9.7% sugary drinks. Consumption of junk food was associated with presence of conventional shop near home,ways type of food provision at school and, food at home after school. Consumption of junk food was found higher among those who got money for food at school (AOR, 2.31), and those who took snacks at home after school (AOR, 12.86).

Conclusions: Consumption of junk food among young children was remarkably high in the study area; concerned authorities should pay attention to dissociating such foods through policies and programs.

Keywords: Children; junk food; Pokhara.

INTRODUCTION

Junk food is defined as foods that contribute high calories but are of limited nutritional value. High revenues from junk food manufacturing industries, urbanization, mouthwatering advertisement, easily convenience at grocery stores have led to a growing trend in the consumption of junk food.[1,2] Junk foods make children addicted to such type of food and they deny eating homemade healthy food that decreases the consumption of nutritious food. [3-6] Junk food consumption and its negative consequences on health status are burning issue and leads to poor nutritional status which undermines the strength of children.[7,8] Despite multiple studies on junk food consumption, only a few studies have been conducted among children, especially in the age group of 5 to 9 years. Thus, the study aimed to assess the junk food consumption behavior of young children and the factors associated with junk food consumption among the study population of Pokhara Metropolitan City.

METHODS

A cross sectional study was conducted among children aged 5 to 9 years in Pokhara Metropolitan City, Kaski using structured interview with one of parents of children. This study is a part of the study, "Prevalence and Correlates of Screen Time, Eating Behavior and Co-occurring of Screen-Time and Unhealthy Eating Behavior among Young Children in Pokhara Metropolitan" which was conducted

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from March to October 2020 with the help of a provincial grant from Nepal Health Research Council. Sample size was calculated using a formula[9]; sample size=z^2pq/E^2 and where P was taken as 0.7 from a previous study[10] and E as 0.05. The total sample included in the study was 352. Regarding sampling technique, a multistage random sampling design was applied. Out of the total 33 wards in Pokhara metropolitan area, three wards were randomly selected. The selected wards were one, four, and twenty seven of the metropolitan. A list of the schools with primary classes was prepared in each ward. Then, one public and one private school were selected randomly in each ward. Students of grade one to four were selected proportionately from each selected school. Based on the list of students, parents were identified and requested to provide information about the food habits of their children by conducting face to face interview with one of the children's parents. Independent variables included sex and age of the child, type of school, occupation of the parents, type of family, and average monthly income of the family. Dependent variables were classified into three categories; packed/energy dense food consumption included biscuits, cookies, chip lays, chocolates, cake, and ice cream; noodles consumption included all types of noodles and sugary drink consumption included soft drinks. Junk food consumption was measured by observing if any or all of the above type of food consumed three or more times in last one week. The measurement was done based on the previous studies.[11, 12]

The Statistical Package on Social Science (SPSS) version 21 was applied for data entry, cleaning and analysis. In all inferential analyses, the level of significance was set at 5%. Chi square test was applied to show association of independent variables with junk food consumption. A multivariate logistic regression test was applied to find out the role of different socio-demographic and environmental factors on junk food consumption. Adjusted odds ratios (AORs) with corresponding 95% confidence intervals (CI) were computed and presented. The Hosmer and Lemeshow goodness of fit test was used to check the model fitness. All model of regressions were fit with the models. Nagelkerke R square of logistic regression model was reported to see the contribution of each model. Ethical approval was obtained from Nepal Health Research Council. Written informed consent was obtained from all respondents before the interview with them.

RESULTS

Table 1 showed the characteristics of study population. Among total study population, more than half (54%) were male, 58.2% were at age of 8-9 years. More than 64% of students were from private schools. The majority of students were living in nuclear families. About half (48.9%) of the respondents had secondary or university level education. Likewise, 53% respondent main occupation was foreign employment/labor. Only 8.2% had monthly income less than 19,000 and majority (81%) of study population had convenient shop near home. About one third (34.4%) children took home food to eat at school. Most of the children (74.4%) consumed home cooked food after school. Only 4.5% respondents gave money to their child for food and only 5% always took their children for shopping.

Table1. Characteristic of children and their parents.

Characteristics (N=352)		n (%)
Sex of the child	Male	190 (54.0)
	Female	162 (46.0)
Age of the child (in years)	5-7	147 (41.80)
	8-9	205 (58.20)
Type of school	Public	126 (35.80)
	Private	226 (64.20)
Type of family	Nuclear	230 (65.30)
	Joint/Extended	122 (34.70)
Education of the respondents	Illiterate	33 (9.40)
	Basic level	147 (41.80)
	Secondary or University level	172 (48.90)

Table1. Characteristic of children and their parents.		
Main occupation of family	Housewife/Agriculture	68 (19.30)
	Business/Service	97 (27.60)
	Foreign employment/constructive work/Labor	187 (53.10)
Monthly income of family (Rs)	≤ 19,000	29 (8.20)
	20,000-39,000	140 (39.80)
	40,000-59,000	79 (22.40)
	≥60,000	75 (21.40)
	Missing	29 (8.20)
Conventional shop near home	Yes	285 (81.0)
	No	67 (19.0)
Type of food at school	Take home made food	121 (34.40)
	Buy from shop	125 (35.50)
	Provided by school	106 (30.10)
Type of food given to child after school	Home cooked food	262 (74.40)
	Buy form shop	90 (25.60)
Giving money to child to buy food	Never	231 (65.60)
	Sometime	93 (26.40)
	Most of the time	12 (3.40)
	Every time/Everyday	16 (4.50)
Taking child for shopping	Never	126 (35.80)
	Sometimes	191 (54.30)
	Most of the time	17 (4.80)
	Every time/Everyday	18 (5.10)

Table 2 showed that 70.7% of the children consumed junk food three or more per week. Consumption of processed or energy dense food three or more times per week was 66.5%. Likewise, 20.7% consumed noodles three or three times a week. About one in ten children drank any type of sugary drink item three or more than three times a week.-

Table 3 showed the association of socio-demographic characteristics and environmental factors with different types of junk food consumption. The type of food at school ($p = 0.006$) and food at home after school ($p<0.001$) were significantly associated with the consumption of energy-dense or packed food among children. The proportion of female children (26%) consuming noodles more than three times a week was higher than that of males (15.8%). The association was statistically significant ($p=0.013$). Similarly, significant variation was observed between noodle consumption among and type of family ($p = 0.009$), food at school ($p = 0.044$) and food at home after school ($p<0.001$). In terms of sugary drink intake, children from private schools (12.4%) consumed significantly more sugary drink than children from public schools (4.8%, $p = 0.023$). Furthermore, types of family ($p = 0.023$),ways of food provision at school ($p = 0.025$) and food at home after school ($p = 0.006$) were found to be significantly associated with noodle consumption.

Table 4 revealed that the association between independent variables and junk food consumption. There was no significant variation between junk food consumption among children and socio-demographic variables. Having conventional shop near home was significantly associated with consumption of junk food more than three times a week ($p = 0.017$). Similarly, food at school ($p = 0.001$) and food at home after school ($p<0.001$) were found to be significantly associated with junk food consumption of the children.

Table 2. Junk Food consumption among young children.

Consumption Behavior (times per week)		n (%)
Junk food consumption	≤2	103 (29.30)
	≥3	249 (70.70)
Types of junk food		
Consumption of processed/energy dense food	≤2	118 (33.50)
	≥3	234 (66.50)
Consumption of noodles	≤2	279 (79.30)
	≥3	73 (20.70)
Consumption of sugary drinks	≤2	318 (90.30)
	≥3	34 (9.70)

Table 3. Association of socio-demographic characteristics and environmental factors with different types of junk food consumption.

Characteristics	Energy Dense/Packed food (per week)		P value	Noodle (per week)		P value	Sugary drink (per week)		P value
	≤2 (%)	≥3 (%)		≤2 (%)	≥3 (%)		≤2 (%)	≥3 (%)	
Sex of the child									
Male	61 (32.10)	129 (67.90)	0.572	160 (84.20)	30 (15.80)	**0.013**	169 (88.90)	21 (11.10)	0.370
Female	57 (35.20)	105 (64.80)		119 (73.50)	43 (26.50)		149 (92.0)	13 (8.0)	
Age of the child (in years)									
5-7	52 (35.40)	95 (64.60)	0.568	122 (83.0)	25 (17.0)	0.182	130 (88.40)	17 (11.60)	0.361
8-9	66 (32.20)	139 (67.80)		157 (76.60)	48 (23.40)		188 (91.70)	17 (8.30)	
Type of school									
Public	43 (34.10)	83 (65.90)	0.906	101 (80.20)	25 (19.80)	0.786	120 (95.20)	6 (4.80)	**0.023**
Private	75 (33.20)	151 (66.80)		178 (78.80)	48 (21.20)		198 (87.60)	28 (12.40)	
Occupation of parents									
Housewife/Agriculture	21 (30.90)	47 (69.10)	0.747	56 (82.40)	12 (17.60)	0.757	57 (83.80)	11 (16.20)	0.062
Business/Service	31 (32.0)	66 (68.0)		77 (79.40)	20 (20.60)		92 (94.80)	5 (5.20)	
Foreign employment/ Labor	66 (35.30)	121 (64.70)		146 (78.10)	41 (21.90)		169 (90.40)	18 (9.60)	
Type of family									
Nuclear	79 (34.30)	151 (65.70)	0.722	192 (83.50)	38 (16.50)	**0.009**	214 (93.0)	16 (7.0)	**0.023**
Joint/Extended	39 (32.0)	83 (68.0)		87 (71.30)	35 (28.70)		104 (85.20)	16 (14.80)	
Environmental factors									
Conventional shop around home									
Yes	89 (31.20)	196 (68.80)	0.063	224 (78.60)	61 (21.40)	0.617	256 (89.90)	29 (10.10)	0.647
No	29 (43.30)	38 (56.70)		55 (82.10)	12 (17.90)		62 (92.50)	5 (7.50)	
Type of food at school									
Taken from home	51 (42.10)	70 (57.90)	**0.006**	101 (83.5)	20 (16.5)	**0.044**	114 (94.2)	7 (5.8)	**0.025**
Buy from shop	29 (23.20)	96 (78.6)		90 (72.0)	35 (28.0)		115 (92.0)	10 (8.0)	
Provided by school	38 (35.80)	68 (64.20)		88 (83.0)	18 (17.0)		89 (84.0)	17 (16.0)	
Type of food after school									
Home cooked food	109 (41.60)	153 (58.40)	**<0.001**	223 (85.10)	39 (14.90)	**<0.001**	244 (93.10)	18 (6.90)	**0.006**
Buy from shop	9 (10.0)	81 (90.0)		56 (62.20)	34 (37.80)		74 (82.20)	16 (17.80)	
Taking child for shopping									
Never	43 (34.10)	83 (65.90)	0.906	106 (84.10)	20 (15.90)	0.101	111 (88.10)	15 (11.90)	0.347
Sometime /every time	75 (33.20)	151 (66.80)		173 (76.50)	53 (23.50)		207 (91.60)	19 (8.40)	
Giving money to child for snack									
Never	79 (34.20)	152 (65.80)	0.723	188 (81.40)	43 (18.60)	0.213	206 (89.20)	25 (10.80)	0.348
Sometime/ every time	39 (32.20)	82 (67.80)		91 (75.20)	30 (24.80)		112 (92.60)	9 (7.40)	

Table 4. Association of socio-demographic characteristics and enabling environment with junk food consumption.

Characteristics	Junk food consumption (per week)		Chi-square value	P value
	≤2 (%)	≥3 (%)		
Socio-demographic				
Sex of the child				
Male	54 (28.40)	136 (71.60)	0.141	0.728
Female	49 (30.20)	113 (69.80)		
Age of the child (in years)				
5-7	48 (32.70)	99 (67.30)	1.403	0.238
8-9	55 (26.80)	150 (73.20)		
Family type				
Nuclear	71 (30.90)	159 (69.10)	0.829	0.391
Joint/Extended	32 (26.20)	90 (73.80)		
School Type				
Public	37 (29.40)	89 (70.60)	0.001	1.00
Private	66 (29.20)	160 (70.80)		
Occupation of parents				
Housewife/Agriculture	21 (30.90)	47 (69.10)	0.182	0.913
Business/Service	29 (29.90)	68 (70.10)		
Foreign employment/Labor	53 (28.30)	134 (71.70)		
Environmental factors				
Conventional shop near home				
Yes	75 (26.30)	210 (73.70)	6.276	**0.017**
No	28 (41.80)	39 (58.20)		
Food at school				
Taken from home	45 (37.20)	76 (62.80)	13.019	**0.001**
Buy from shop	22 (17.60)	103 (82.40)		
Provided by school	36 (34.0)	70 (66.0)		
Food at home after school				
Home cooked food	99 (37.80)	163 (62.20)	35.977	**<0.001**
Buy from shop	4 (4.40)	86 (95.60)		
Giving money to child				
Never	71 (30.70)	160 (69.30)	0.706	0.460
Sometime/ every time	32 (26.40)	89 (73.60)		
Taking child for shopping				
Never	36 (28.60)	90 (71.40)	0.045	0.903
Sometime/ every time	67 (29.60)	159 (70.40)		

Multivariate logistic was applied to find out the effect of socio-demographic and environmental factors on junk food consumption. Model first model comprised the socio-demographic variables only. The second model included the environmental factors. In the final model (Model III), all the variables were included. All three models were fit with the variables entered as indicated (Hosmer and Lemeshow test) the. Nagelkerke R^2 value was found 0.011, 0.22 and 0.230, respectively, which means 1%, 22% and 23% variation in the consumption of junk food is contributed by socio-demographic factors, environmental factors, and socio-demographic and environmental both factors among school going children. The goodness value of fit P was found to be 0.63, 0.45 and 0.47, which means that it is more than 0.05. The models are therefore fit.

Female students were 33% less likely (AOR 0.671, CI 95% [0.396-1.137]) to consume junk food with reference to male students. Students whose age was between 8 and 9 years have a 1.11 times greater likelihood (AOR 1.112, CI 95% [0.655-

1.887]) to consume junk food compared to reference age 5-7 years old students. Children who were from private schools were 15% less likely (AOR 0.857, CI 95% (0.467-1.574]) to consume junk food compared with students form public schools. Children whose parents' main occupation was business or service had 0.99 times less likely (AOR 0.993, CI 95% [0.467-2.115]) to consume junk food compared to students whose parents were involved in agriculture. In contrast, participants whose parents' who abroad job or labor work had 1.04 times higher probability (AOR, 1.040, CI 95% [0.532-2.031]) of consuming junk food compared to the reference group. Children who lived in joint/extended family had 1.47 more chance (AOR 1.476, CI 95% [0.842-2.586]) to consume junk food compared to children who lived in nuclear family. Children who had no convenient shop near home had 46% less chance (AOR 0.548, CI 95% [(0.298-1.009]) to consume junk food compared to those who had a shop near home. Those children who bought food from the shop had a 2.31 times (AOR 2.319, CI 95% [1.227-4.381]) higher chance and who ate school food had a 1.07 times higher chance (AOR 1.072, CI 95% [0.57-2.018]) of consuming junk food compared to children who took food from home. Parents' offering shop food showed a significant association with junk food consumption. Those parents' who offer shop food for food after school had 12.86 times more chance (AOR 12.864, CI 95% [4.479-36.941]) to consume junk food compared to those who offer home-cooked food. Those children who ate food bought from shop after school were significantly more likely to consume junk food consumption.

Table 5. Relationship of different socio-demographic and enabling environment with junk food consumption.

Characteristics		Model I Consumption of junk food AOR (95% CI)	P value	Model II Consumption of junk food AOR (95% CI)	P value	Model III Consumption of junk food AOR (95% CI)	P value
Sex of the child (ref:Male)	Female	0.909 (0.563-1.466)	0.695	-	-	0.671 (0.396-1.137)	0.138
Age of child (ref: 5-7 years)	8-9 years	1.333 (0.834-2.131)	0.229	-	-	1.112 (0.655-1.887)	0.695
Type of school (ref: Public)	Private	0.983 (0.587-1.646)	0.948	-	-	0.857 (0.467-1.574)	0.619
Occupation of parents (ref: Housewife/ Agriculture)	Business/ Service	1.001 (0.506-1.977)	0.999	-	-	0.993 (0.467-2.115)	0.986
	Foreign employment/ Labor	1.102 (0.600-2.025)	0.755	-	-	1.040 (0.532-2.031)	0.909
Family Type (ref: Nuclear)	Joint/ Extended	1.290 (0.779-2.134)	0.322	-	-	1.476 (0.842-2.586)	0.174
Environmental factors							
Conventional shop (ref: Yes)	No	-	-	0.552 (0.303-1.004)	0.052	0.548 (0.298-1.009)	0.054
Food at school (ref: Taken from home)	Buy from shop	-	-	2.228 (1.199-4.141)	0.011	2.319 (1.227-4.381)	0.010
	Provided by school	-	-	1.049 (0.581-1.896)	0.873	1.072 (0.57-2.018)	0.828
Food at home after school (ref: Home cooked)	Buy from shop	-	-	12.078 (4.256-34.276)	<0.001	12.864 (4.479-36.941)	<0.001
Giving money to child (ref: Never)	Sometime/ most of the time/ every time	-	-	1.288 (0.754-2.201)	0.354	1.311 (0.748-2.297)	0.344
Taking child for shopping (ref: Never)	Sometime/ most of the time/ every time	-	-	0.843 (0.496-1.434)	0.529	0.847 (0.489-1.466)	0.552
Nagelkerke R^2		0.011		0.221		0.234	
P value (Hosmer and Lemeshow test)		0.636		0.454		0.473	

DISCUSSION

The current study assessed junk food consumption habits as well as the variables related to junk food intake in 5-9-year-old school children. Unhealthy diets are key risk factor for poor brain development, weak learning, low immunity[13], prone to non-communicable diseases (NCDs) in children, including obesity, and premature mortality.[14, 15] Despite this, unhealthy eating behaviour in children and adolescents is increasing across most world regions.[16] Studies have shown that parenting, home, and school environments largely influence children's eating behaviour.[17, 18] Limited research has been conducted on primary level students. Therefore, we compared our results with similar studies conducted on different age groups. In our study, we found that all children had consumed some type of junk food at least once in the week before the survey. Out of all, seven out of ten had consumed more than three times a week. A similar finding was observed in the Nepal Demographic Health Survey[19], 2022, which reported that 49% of children aged six to 11 months consumed unhealthy food, compared to 78% of children aged 12 to 23 months. Similarly, a couple of studies conducted in Jumla and Pokhara, Nepal, among adolescents aged 13-19 years, showed a prevalence of junk food consumption of 84%[20] and 66% [21] respectively. The findings from the above-mentioned studies were quite concerning. Junk food has become a regular part of children's lives as early as six months of age, following the introduction of complementary feeding. Moreover, they also suggest that junk food consumption (JFC) might increase with age.

The most preferred junk food in our study was processed, energy-dense food (66.5%), followed by noodles (20.7%), and sugary drinks (9.7%). The findings are supported by a couple of studies conducted in Pokhara, Nepal.[21, 22]These studies observed that salty snacks and chocolates are the most preferred types of junk food among adolescent students. Although male students consumed more junk food than female students, our study did not find a significant relationship between gender and JFC. A study conducted with Australian children aged 6-10 years revealed similar results.[23] However, in contrast to our study, a study from Pokhara, Nepal[6] found that female adolescents consumed significantly more junk food compared to their male counterparts. Furthermore, a systematic review of 22 studies concluded that there was a significant association between gender and junk food consumption.[24]The age difference of the study population might explain the conflicting results.

According to a study from Bangladesh[25], fast food is gaining popularity among nuclear families. In addition to, the family's socioeconomic status significantly influences children's consumption of fast food. A similar conclusion was drawn from a study conducted in Pokhara, Nepal.[21] However, our results showed that the consumption of junk food was not associated with family types or school types. The reason could be, younger children are not as effective as adolescents in asserting their preferences for food. Relationship of junk food consumption with socio-economic status was not assessed in our study. Although the parents' occupation was not found significant in the study, a previous study reported that individual limited time was one of the significant factor for junk food consumption among adult population.[2] Limited available time as a main reason for preferring junk food was one of the factors in a study conducted in USA. However in case of the children, parents' time, parent occupation and their behaviour might influence what their children consume during the week.

In terms of environmental factors, the variables that demonstrated a significant relationship with junk food consumption in this study were purchasing food from a shop for school lunch and after-school home lunch. The likelihood of consuming junk food consumption doubled among children who bought food for school lunch from a shop compared to those who brought lunch from home. However, no association was found among the children who received lunch provided in the school canteen. This shows if parents send home made food with their children to consume at school, they consume less junk food than the children are sent with money to buy at school. This may also be the positive effect of the school health and nutrition program implemented by the Nepal government in 2008, in which both private and government schools were encouraged to provide midday meals as healthy as possible by using locally grown food.[26] In contrast to this finding, a study from Chitwan revealed that junk food was allowed in the schools, and adolescents having lunch in school canteens were more likely to consume junk food.[27] Although Nepal has banned use of ready-made food as a mid-day meal since 2021[28], the school authorities are not abiding by the rule in some region. In fact, the restriction of junk food is not included in school rules either. The reason of consuming junk might also be associated to taste value rather than nutrition value. On this line, a study conducted among Saudi adults conducted in Jeddah City reported that the respondents preferred junk food over home-cooked meals because it was more delicious.[2] Furthermore, adolescence is considered

a healthy stage[29], so parents tend to give more freedom in food choices than they do for younger children. Another reason could be that bringing junk food at school for adolescents could be a source of entertainment and pride among friends, leading to neglect of home-cooked food. The proximity of conventional shops to the home did not have a significant impact on the consumption of junk food among children, as these shops are commonly located along the route to schools. Overall, accessibility and closeness to junk food outlets, food flavour, marketing, advertising, ease of access to junk food, urbanization, busy lifestyles, and boredom with traditional family food may all have an impact on the amount of junk food consumed.[4, 25, 30-33]

The study design has a limitation that it does not establish causality. As the study was conducted in metropolitan city, it may lack generalizability in rural setting.

CONCLUSIONS

The study revealed a huge proportion of 5 to 9 years children were consuming junk food every week. The consumption was almost similar among socio-demographic characteristics of the study population. Environmental factors such as conventional store near the house, ways of food provision at school and type of food that is provided at home after school were significantly associated with higher level of consumption. Initiatives to promote healthy eating in young children seem to have to center on the food environments around schools, home and role of parents.

CONFLICT OF INTEREST

There are no conflicts of interest.

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