Research Article

Lifestyle and Dietary Behaviors among Saudi Preschool Children Attending Primary Health Care Centers, Eastern Saudi Arabia

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Objective. To study life styles and dietary behaviors among Saudi preschool children (1–5 years) attending primary health care centers (PHCCs) in Dammam and Qatif areas, eastern province, Saudi Arabia. Material and Methods. Cross-sectional study. Data were collected using structured, interviewer-filled questionnaire. Children and their mothers were encountered during their well-baby clinic visits. A total number of 300 preschool children and their mothers were interviewed during study period. Results. Unsatisfactory areas include smoking fathers (32%), smoking in front of children (11.3%), overweight and obesity among mothers (60.3%), noncompliance using seat belts for both parents (56.3%) and children (68%), children watching television (T.V) more than 2 hours (50%), adherence to exclusive breast feeding (only 20.7%), and late solid food introduction (65.3%). Frequent intake of unhealthy food items was 26%, 25%, and 24% for pizza, burger, and soft drinks. Unfortunately frequent intake of the following unhealthy food items was high: biscuits, deserts/chocolates, and chips which was 78%, 67%, and 72%, respectively. Conclusion. This study provides benchmark about the current situation. It provides health care workers and decision makers with important information that may help to improve health services.

1. Introduction

Recent research has begun to focus on effects of family and social influences on children’s lifestyle and eating patterns [1]. Key components of pediatric lifestyle include starting with exclusive breast feeding, optimal nutrition, maintaining appropriate weight, moderate physical activity, optimum sleep duration, and avoidance of long hours of watching television (TV) [2–4]. Cardiovascular risk factors start in early childhood with fatty streaks evident in the arteries of children [4]. Recently, levels of blood cholesterol and triglycerides have been found to be increasing in children while the high density lipoproteins decreased [4]. Moreover Research has demonstrated that both the physical and social environment strongly affect the eating patterns of children [1]. Social environment, including various socioeconomic and sociocultural factors, influence the types of foods that children eat [1]. Parents actually have potential and powerful role in behavioral change strategies which aim to improve the lifestyle behaviors of young children [2]. Parental obesity, low parental educational level, low total family income, long hours of TV watching, absence of breastfeeding, and physical inactivity were significantly associated with childhood overweight/obesity [1]. Low maternal educational level and allowing children to watch TV more than 2 hours were also associated with unhealthy snacky pattern [3]. Overeating-type eating style and sedentary activities are observed frequently in the children from obese/overweight families [5]. This is associated with the fact that these children had a higher preference for fatty foods with a lower liking for vegetables [5]. The mother’s work status played a significant role in the early termination of breastfeeding [6]. Early return to work and lack of maternity leave contribute to early cessation of breastfeeding or lack of exclusive breastfeeding [4]. Long hours of maternal employment, rather than lack of money, may impede children’s access to healthy foods and physical
activity but there was no evidence for that association with paternal work [7]. Family income often affects accessibility to healthy food that is why the lower socioeconomic status acts as a barrier to the fruit and vegetables intake and makes the intake of fat higher compared to children in relatively higher socioeconomic groups [1]. However, to fulfill this role, parents need to have the necessary knowledge and motivation to assimilate dietary guidelines [2]. Some day care centers play an important role in the development of children's eating habits by focusing on issues such as providing and making healthful food choices like fruit and vegetables [2]. Playing is very important for child development because it contributes to the cognitive, physical, social, and emotional well-being and should be included along with academic and social-enrichment opportunities [8]. In addition, sleep duration is important for children. An inverse association was observed between sleep duration and the risk of developing childhood overweight/obesity [2]. Promoting healthier eating patterns among children requires a multifaceted approach targeting children, parents, families, and schools. Interventions aimed at improving children's nutrition need first to address variety of social and physical factors that could influence children's eating patterns. Clearly, this area is rich and needs researches to address multiple influences on children's eating patterns and lifestyle.

2. Methodology

This cross-sectional study was conducted in PHCCs in Qatif and Dammam areas, eastern region, Saudi Arabia. Study population included Saudi preschool children (1–5 year old) attending chosen PHCCs and their mothers/caregivers. Systemic random sampling technique was used by choosing every second PHCC from lists of PHCCs provided by ministry of health in both Dammam and Qatif areas. A total of 13 centers out of the 27 centers in Qatif and 11 centers out of the 22 centers in Dammam were chosen where children and their caregivers were encountered during their well-baby clinic visits. All preschool children and their mothers attending the chosen centers were interviewed on days of study visit. A total number of 326 preschool children and their mothers were interviewed during study period.

Data were collected using structured, interviewer-filled questionnaire which has been designed by the researchers after reviewing the recent literature and similar questionnaires and based on the objectives of the study putting in consideration sociocultural backgrounds. The questionnaire was divided into four parts: First part included sociodemographic data of the care givers like age, sex, marital status, occupation, and so forth. Second part included questions to assess practice of healthy styles among parents for example smoking, use of seat belt . . . and so forth. Third part included child socio-demographic data and child lifestyles, for example, age, sex weight, height, rank, siblings, attending nursery, TV watching, physical activity, sleeping pattern, breast feeding and weaning, and so forth. Fourth part included questions about dietary behaviors of children, for example, number of meals, number of snacks, and so forth. Consumption of different types of commonly available healthy and unhealthy food items (19 item) was evaluated using simplified Arabic frequency questionnaire which has high internal consistency (Cronbach's alpha scores of >0.74).

A pilot study was conducted on 20 patients—different from the target group—to check understanding and applicability of the questionnaire. Based on the results, some linguistic modifications of questions were made to avoid confusion about questions and make easier understanding and interpretation by participants. Questionnaire was then reviewed by researchers, two of them have Saudi Arabian slang: one from Qatif and the other from Dammam, before and after pilot study for necessary linguistic modifications of some confusing words. Questionnaires were reviewed for completeness and invalid questionnaires were excluded giving a total of 300 valid questionnaires.

Questionnaire was validated after modification. Questionnaire was reviewed by 2 faculties, revised questionnaires were compared and necessary modifications were made before finally approved by the reviewers.

The participants were approached in well baby clinics of chosen primary health care centers. They were met and explained purpose of the study, reassured that questionnaires are anonymous, and informed that collected data will kept confidential and used only for study purpose. The questionnaire was explained to them and all their questions were answered before obtaining their informed consent.

The data were coded, entered, and analyzed in a personal computer using statistical package for social sciences (SPSS) software version 16. Data were presented using descriptive statistics in form of frequencies and percentages for qualitative variables and mean and standard deviation (SD) for quantitative variables. Chi-square test and/or logistic regression analysis were used as appropriate to determine association.

The study was approved by ethical committee of Postgraduate Saudi Board Program, Eastern Province. All necessary approvals from ministry of health including ethical approval were obtained.

3. Results

A total of 300 valid questionnaires were obtained representing 300 preschool children and their mother's responses. The mean age for study population mothers in years was 31.2 ± 5.6 SD. All care givers in this study were children's mothers. Nearly half of the mothers (47.7%) were in age range 30 to 40 years, Most of the sample was married (98.3%) and 71.3% of them have very good relationships with the fathers. Educational level of the mothers and fathers in this study was university graduation or above in 50% and 48.3%, respectively, and more than half of the mothers (52.7%) were housewives (Table 1).

Some life style characters of parents of study group including smoking habits, use of seat belts, and body mass index of study mothers are illustrated in Table 2 while Table 3 shows the Sociodemographic characteristics and health behaviors of the children participating in the study.
Table 1: Sociodemographic data of the parents of the children participating in the study.

| Sociodemographic characteristic | Total (n = 300) | No | %  |
|--------------------------------|----------------|----|----|
| Age of the mother in years     |                |    |    |
| (i) <20                        | 3              | 1.0|    |
| (ii) 20–<30                     | 127            | 42.3|   |
| (iii) 30–<40                    | 143            | 47.7|   |
| (iv) ≥40                       | 27             | 9.0|    |
| Mean age in years ± SD = 31.2 ± 5.6 |        |    |    |
| Marital status of the mother   |                |    |    |
| (i) Married with father         | 295            | 98.4|   |
| (ii) Divorced                   | 4              | 1.3|    |
| (iii) Widow                     | 1              | 0.3|    |
| Educational level of the mother |                |    |    |
| (i) Illiterate/Read and write   | 6              | 2.0|    |
| (ii) Primary school             | 13             | 4.3|    |
| (iii) Intermediate              | 15             | 5.0|    |
| (iv) High or diploma            | 116            | 38.7|   |
| (v) University or more          | 150            | 50.0|   |
| Total family income in Saudi Riyals (SR) |       |    |    |
| (i) <2000                       | 10             | 3.3|    |
| (ii) 2000–4999                  | 54             | 18.0|   |
| (iii) 5000–9999                 | 104            | 34.7|   |
| (iv) 10000–14999                | 59             | 19.7|   |
| (v) 15000 or more               | 73             | 24.3|   |
| Relationship between parents (mother statement) | | | |
| (i) Very good                   | 214            | 71.3|   |
| (ii) Good                       | 5.9            | 19.7|   |
| (iii) Minor problems            | 20             | 6.7|    |
| (iv) Major problems             | 3              | 1.0|    |
| (v) Separated                   | 4              | 1.3|    |
| Family type                     |                |    |    |
| (i) Nuclear family              | 213            | 71.0|   |
| (ii) Extended family            | 87             | 29.0|   |
| Mother work                     |                |    |    |
| (i) Housewife                   | 158            | 52.7|   |
| (ii) Employed                   | 142            | 47.3|   |
| father work                     |                |    |    |
| (i) Not working                 | 14             | 4.7|    |
| (ii) Manual worker              | 30             | 10.0|   |
| (iii) Professional              | 256            | 85.3|   |

Table 2: Life style of parents of study group children.

| Life style of the parents | Total (n = 300) | No | %  |
|---------------------------|----------------|----|----|
| Smoking                   |                |    |    |
| (i) Smoking father        | 96             | 32.0|   |
| (ii) Smoking mother       | 4              | 1.3|    |
| (iii) Smoking in front children | 34 | 11.3|   |
| Fastening seat belt       |                |    |    |
| (i) Parents fastening seat belt | 131 | 43.7|   |
| (ii) Children fastening seat belt | 96 | 32.0|   |
| BMI of the mother         |                |    |    |
| (i) Underweight (<18.5)   | 9              | 3.0|    |
| (ii) Normal (18.5–<25)    | 110            | 36.7|   |
| (iii) Overweight (25–<30)  | 96             | 32.0|   |
| (iv) Obese class 1 (30–<35) | 53            | 17.6|   |
| (v) Obese class 2 (35–<40) | 24             | 8.0|    |
| (vi) Morbid obese (40 or more) | 8              | 2.7|    |

including age, sex, birth order, number of siblings, and child morbidity. Table 4 illustrates health behaviors of the children including playing patterns, TV watching, modes of breast feeding and weaning, nursery/kindergarten attendance, and meal and snacking patterns. Distribution of studied children according to their nutritional status showed that all anthropometric measurements lie within normal range for study population children. Weight and height were measured and then weight for age, height for age, and weight for height were calculated for all children participating in this study using standard age suitable charts. All charts used were latest Saudi growth charts used by MOH (Table 5). Factors related to consumption of healthy food items among study population preschool children are shown in Table 6. Consuming more vegetables was significantly related to number of meals per day ($P = 0.00$), while frequency of fruit consumption was more in children whom mothers were housewives ($P = 0.00$), children living in nuclear family ($P = 0.03$), and children eating more snacks ($P = 0.00$). Legumes consumption was more among those living in Dammam ($P = 0.00$) and in children consuming more meals ($P = 0.04$). 60.20% of children who consume frequent amounts of legumes were taking three meals/day. Factors significantly affecting consuming unhealthy food items in preschool study population children are shown in Tables 7 and 8. Children rising in nuclear families were consuming pizza and burger more frequently than children rising in extended families (75.90% and 81.60%, resp.), while children of families living in Qatif were consuming burger and soft drinks less frequently. Soft drinks consumption was also less frequent in children who eat more meals ($P = 0.002$) and among children not attending and those attending less months in nursery or kindergarten ($P = 0.015$) (Table 7). Children in families with higher total monthly income were consuming more amounts of biscuit ($P = 0.04$). Also children who were not attending nursery or kindergarten where consuming more amount deserts/chocolate ($P = 0.04$). Watching TV more than 2 hours was associated with more frequent consumption of deserts/chocolate and chips ($P = 0.025$) and ($P = 0.006$), respectively. In addition, chips consumption was more
Table 3: Sociodemographic characteristics of the children participating in the study.

| Sociodemographic characteristic of the children | Total (n = 300) | No | % |
|------------------------------------------------|----------------|-----|----|
| Child age in years                             |                |     |    |
| (i) 1 year                                     | 43             | 14.3|    |
| (ii) 2 years                                   | 75             | 25.0|    |
| (iii) 3 years                                  | 52             | 17.3|    |
| (iv) 4 years                                   | 50             | 16.7|    |
| (v) 5 years                                    | 80             | 26.7|    |
| Child sex                                      |                |     |    |
| (i) Male                                       | 137            | 45.7|    |
| (ii) Female                                    | 163            | 54.3|    |
| Child order                                    |                |     |    |
| (i) 1st                                        | 111            | 37.0|    |
| (ii) 2nd                                       | 70             | 23.3|    |
| (iii) 3rd                                      | 35             | 11.7|    |
| (iv) 4th                                       | 36             | 12.0|    |
| (v) 5th or more                                | 48             | 16.0|    |
| Number of siblings                             |                |     |    |
| (i) No siblings                                | 48             | 16.0|    |
| (ii) 1 sibling                                 | 75             | 25.0|    |
| (iii) 2 siblings                               | 60             | 20.0|    |
| (iv) 3 siblings                                | 43             | 14.3|    |
| (v) 4 siblings or more                         | 74             | 24.7|    |
| Child attending nursery or kindergarten (KG)   |                |     |    |
| (i) Attending                                  | 86             | 28.7|    |
| (ii) Not-attending                             | 214            | 71.3|    |
| Number of months attended in nursery or KG/year|                |     |    |
| (i) 3–5 months                                 | 4              | 1.3 |    |
| (ii) 6–8 months                                | 45             | 15.0|    |
| (iii) 9–12 months                              | 37             | 12.4|    |
| (iv) Not-attending                             | 214            | 71.3|    |
| Number of hours attended in nursery or KG/day  |                |     |    |
| (i) 3–6 hours                                  | 64             | 21.4|    |
| (ii) 7–10 hours                                | 22             | 7.3 |    |
| (iii) Not-attending                            | 214            | 71.3|    |
| Number of meals eaten in nursery or KG         |                |     |    |
| (i) 1 meal                                     | 57             | 19.0|    |
| (ii) 2 meals                                   | 27             | 9.0 |    |
| (iii) 3 meals                                  | 2              | 0.7 |    |
| (iv) Not-attending                             | 214            | 71.3|    |

frequent in children of housewife mothers (P = 0.037) (Table 8).

Table 4: Health behaviors of the children participating in the study.

| Health behaviors                      | Total (n = 300) | No | % |
|---------------------------------------|----------------|-----|----|
| TV watching hours/day                  |                |     |    |
| (i) <2 hours                          | 150            | 50.0|    |
| (ii) ≥2 hours                         | 150            | 50.0|    |
| Playing hours/day                     |                |     |    |
| (i) <2 hours                          | 33             | 11.0|    |
| (ii) 2–4 hours                        | 128            | 42.7|    |
| (iii) ≥5 hours                        | 139            | 46.3|    |
| Breast feeding duration               |                |     |    |
| (i) Never                             | 32             | 10.7|    |
| (ii) ≤6 months                        | 79             | 26.3|    |
| (iii) 6 months–<1 year                | 60             | 20.0|    |
| (iv) 1 year–<1.5 year                 | 39             | 13.0|    |
| (v) 1.5–2 year                        | 90             | 30.0|    |
| Bottle feeding duration               |                |     |    |
| (i) Never                             | 62             | 20.7|    |
| (ii) ≤6 months                        | 76             | 25.3|    |
| (iii) 6 months–<1 year                | 36             | 12.0|    |
| (iv) 1 year–<1.5 year                 | 33             | 11.0|    |
| (v) 1.5–2 year                        | 93             | 31.0|    |
| Solid food introduction in age         |                |     |    |
| (i) ≤6 months                         | 104            | 34.7|    |
| (ii) 6 months or more                 | 196            | 65.3|    |
| Number of meals/day                   |                |     |    |
| (i) 1 meal                            | 12             | 4.0 |    |
| (ii) 2 meals                          | 87             | 29.0|    |
| (iii) 3 meals                         | 190            | 63.3|    |
| (iv) 4 meals                          | 11             | 3.7 |    |
| Number of snacks/day                  |                |     |    |
| (i) 1 snack                           | 82             | 27.3|    |
| (ii) 2 snacks                         | 134            | 51.4|    |
| (iii) 3 snacks                        | 55             | 18.3|    |
| (iv) 4 snacks                         | 9              | 3.0 |    |

4. Discussion

Frequency of smoking among fathers was 32%, while 1.3% of mothers were smokers. 11.3% of children were passive smokers due to father or mother smoking. These percentages are in the ranges of the national data. Bassiony (2009) in his study showed prevalence of smoking in Saudi males ranges from 13 to 38% (median = 26.5%), while in Saudi females it ranges from 1 to 16% (median = 9%) [9]. A study done in Germany shows that 28.5% of fathers and 20.7% of mothers were smokers [10]. Characteristically in our study prevalence of smoking among mothers was low in contrast to smoking among fathers.

Regarding fastening seatbelt, 43.7% of parents who participated in our study used to fasten seatbelt. A study done in eastern province in Saudi Arabia shows that the usage of seatbelts ranged from 17 to 100% with a mean of 56.8% [11]. Another study done in Riyadh showed that 62.4% of
Table 5: Distribution of studied children according to their nutritional status.

| Anthropometric measurement | Nutritional status | No | %   | Minimum | Maximum |
|----------------------------|--------------------|----|------|---------|---------|
| Weight/age                 | Underweight        | 0  | 0.00 | −1.48   | 1.58    |
|                            | Normal             | 300| 100.00|         |         |
|                            | Overweight         | 0  | 0.00 |         |         |
| Height/age                 | Stunted            | 0  | 0.00 | −1.28   | 1.65    |
|                            | Normal             | 300| 100.00|         |         |
|                            | Tall               | 0  | 0.00 |         |         |
| Weight/height              | Wasted             | 0  | 0.00 |         |         |
|                            | Normal             | 300| 100.00| 1.59    | 1.23    |
|                            | Overweight         | 0  | 0.00 |         |         |
| Total                      |                    | 300| 100.00|         |         |

Table 6: Factors significantly affecting consumption of healthy food items (vegetables, fruits, and legumes) in preschool study population children.

| Vegetables          | Rare (n = 28) | Infrequent (n = 29) | Frequent (n = 243) | Test of significance (P value) |
|---------------------|---------------|---------------------|--------------------|--------------------------------|
| Number of meals/day |               |                     |                    |                                |
| (i) 1 meal          | 5             | 17.90               | 3                  | 10.30                          | 4                  | 1.60 |
| (ii) 2 meals        | 8             | 28.90               | 15                 | 51.70                          | 64                 | 26.30 |
| (iii) 3 meals       | 15            | 53.60               | 11                 | 37.90                          | 164                | 67.50 |
| (iv) 4 meals        | 0             | 0.00                | 0                  | 0.00                           | 11                 | 4.50 |

| Fruits              | Rare (n = 20) | Infrequent (n = 22) | Frequent (n = 258) | Test of significance (P value) |
|---------------------|---------------|---------------------|--------------------|--------------------------------|
| Number of snack/day |               |                     |                    |                                |
| (i) 1 snack         | 6             | 30.00               | 15                 | 68.20                          | 61                 | 23.60 |
| (ii) 2 snacks       | 12            | 60.00               | 4                  | 18.20                          | 138                | 53.50 |
| (iii) 3 snacks      | 2             | 10.00               | 1                  | 4.50                           | 52                 | 20.20 |
| (iv) 4 snacks       | 0             | 0.00                | 2                  | 9.10                           | 7                  | 2.70 |

| Legumes             | Rare (n = 147) | Infrequent (n = 50) | Frequent (n = 103) | Test of significance (P value) |
|---------------------|---------------|---------------------|--------------------|--------------------------------|
| City                |               |                     |                    |                                |
| (i) Qatif           | 85            | 57.80               | 19                 | 38.00                          | 46                 | 44.70 |
| (ii) Dammam         | 62            | 42.20               | 31                 | 62.00                          | 57                 | 55.30 |
| Number of meals     |               |                     |                    |                                |
| (i) 1 meal          | 9             | 6.10                | 1                  | 2.00                           | 2                  | 1.90 |
| (ii) 2 meals        | 45            | 30.60               | 6                  | 12.00                          | 36                 | 35.00 |
| (iii) 3 meals       | 88            | 59.90               | 40                 | 80.00                          | 62                 | 60.20 |
| (iv) 4 meals        | 5             | 3.40                | 3                  | 6.00                           | 3                  | 2.90 |
Table 7: Factors significantly affecting consuming unhealthy food items (pizza, burger, and soft drinks) in preschool study population children.

|                        | Rare (n = 148) | Pizza (n = 73) | Frequent (n = 79) | Test of significance |
|------------------------|---------------|---------------|-------------------|----------------------|
|                        | No | %  | No | %  | No | %  |                 |                      |
| **Type of the family** | (i) Nuclear | 92 | 62.20 | 61 | 83.60 | 60 | 75.90 | $X^2 = 12.14$ | ($P = 0.002$) |
|                        | (ii) Extended | 56 | 37.80 | 12 | 16.40 | 19 | 24.10 |                      |                      |
| **Burger**             | Rare (n = 177) | 96 | 54.20 | 16 | 34.00 | 38 | 50.00 | $X^2 = 6.05$ | ($P = 0.048$) |
|                        | Infrequent (n = 47) | 81 | 45.80 | 31 | 66.00 | 38 | 50.00 |                      |                      |
| **Soft drinks**        | Rare (n = 202) | 108 | 53.5 | 15 | 57.7 | 27 | 37.5 | $X^2 = 6.08$ | ($P = 0.048$) |
|                        | Infrequent (n = 26) | 94 | 46.5 | 11 | 42.3 | 45 | 62.5 |                      |                      |
| **City**               | (i) Qatif | 112 | 63.30 | 39 | 83.00 | 62 | 50.00 | $X^2 = 12.53$ | ($P = 0.002$) |
|                        | (ii) Dammam | 65 | 36.70 | 8 | 17.00 | 14 | 24.00 |                      |                      |

**Number of meals**

|                        | (i) 1 meal | 10 | 5.00 | 0 | 0.00 | 2 | 2.80 |                      |                      |
|                        | (ii) 2 meals | 43 | 21.30 | 9 | 34.60 | 35 | 48.60 | $X^2 = 20.77$ | ($P = 0.002$) |
|                        | (iii) 3 meals | 141 | 69.80 | 16 | 61.50 | 33 | 45.80 |                      |                      |
|                        | (iv) 4 meals | 8 | 4.00 | 1 | 3.80 | 2 | 2.80 |                      |                      |

**Number of months in nursery/year**

|                        | (i) 0 | 149 | 73.80 | 15 | 57.70 | 50 | 69.40 | $X^2 = 33.38$ | ($P = 0.015$) |
|                        | (ii) 3–5 | 2 | 10.00 | 17 | 65.40 | 0 | 0 |                      |                      |
|                        | (iii) 6–8 | 28 | 13.90 | 5 | 19.20 | 12 | 16.70 |                      |                      |
|                        | (iv) 9–12 | 23 | 11.50 | 4 | 15.30 | 10 | 12.60 |                      |                      |

Participants were fastening seatbelt [12]. A regional study done in gulf area shows that the median percentage of the seatbelt noncompliance was significantly higher in the Gulf countries (52%) compared with the high-income countries (14.5%) ($P < 0.001$) [13]. Fastening seat belt among parents was less in our study than national, regional, and international studies. Only 34% of parents of children in our study were fastening seatbelt compared to only 24% in Jeddah [14], while a study done in USA shows that 91% of children were restrained in the car [15].

This means that fastening seatbelt awareness and rules in our country is underdeveloped and needs improvement.

About weight in our study, mothers showed that 36.7% have normal body weight, 32% were overweight, and 28.1% were obese which is similar to results of the study of Al-Nozha done in KSA 2005 that showed overall prevalence of obesity 35.6% (95% CI: 34.9–36.3), while severe (gross) obesity was 3.2% [16]. In Bahrain, approximately 32% of women were obese (BMI $\geq 30$) [17]. Generally speaking there is a significant increase in the incidence of obesity with a prevalence of 2%–55% in adult females and 1%–30% in adult males over the Arabic-speaking countries [18].

In our study population, 50% of the children watch TV for less than 2 hours and the remaining 50% watch for 2 hours or more. The American Academy of Pediatrics (AAP) recommends that children 2 years and older watch <2 hours of television per day and that children younger than 2 years watch no television [19]. However, 26% of US children watched 4 or more hours of television per day and 67% watched at least 2 hours per day [20]. In our study TV watching was associated with more frequent consumption of unhealthy items (chips and chocolate). Studies have shown unhealthy pattern of diets with TV watching with more unhealthy items and less healthy items intake and less frequent meals [21–23].
Table 8: Factors significantly affecting consuming unhealthy food items (pizza, burger, and soft drinks) in preschool study population children.

|                          | Biscuit | Chocolate | Chips |
|--------------------------|---------|-----------|-------|
|                          | Rare (n = 29) | Infrequent (n = 36) | Frequent (n = 235) | Test of significance (P value) |
| Total family income in Saudi Riyals (S.R) | No | % | No | % | No | % | $X^2$ |
| (i) less than 2000      | 1 | 3.40 | 0 | 0.00 | 9 | 3.80 | 15.75 |
| (ii) 2000–4999          | 7 | 24.10 | 0 | 0.00 | 47 | 20.00 | (P = 0.049) |
| (iii) 5000–9999         | 11 | 37.90 | 14 | 38.90 | 79 | 33.60 | |
| (iv) 10000–14999        | 2 | 6.90 | 12 | 33.33 | 45 | 19.10 | |
| (v) 15000 or more       | 8 | 27.60 | 10 | 27.80 | 55 | 33.40 | |

|                          | No | % | No | % | No | % | $X^2$ |
|--------------------------|----|---|----|---|----|---|-----|
| Child attending nursery or kindergarten |    |   |    |   |    |   |     |
| (i) Yes                  | 8 | 14.80 | 15 | 33.30 | 63 | 31.30 | 6.25 |
| (ii) No                  | 46 | 85.20 | 30 | 66.70 | 138 | 68.7 | (P = 0.04) |
| TV watching hours/day    |    |   |    |   |    |   |     |
| (i) less than 2 hours    | 34 | 63.00 | 27 | 60.00 | 89 | 44.30 | 11.11 |
| (ii) 2 hours or more     | 20 | 37.10 | 18 | 40.00 | 112 | 55.70 | (P = 0.025) |

|                          | No | % | No | % | No | % | $X^2$ |
|--------------------------|----|---|----|---|----|---|-----|
| Mother work              |    |   |    |   |    |   |     |
| (i) Housewife            | 25 | 54.30 | 13 | 33.30 | 120 | 55.80 | 6.75 |
| (ii) Working             | 21 | 45.70 | 26 | 66.70 | 95 | 44.20 | (P = 0.034) |
| TV watching hours/day    |    |   |    |   |    |   |     |
| (i) less than 2 hours    | 32 | 69.60 | 21 | 53.80 | 97 | 45.10 | 14.39 |
| (ii) 2 hours or more     | 14 | 30.00 | 18 | 46.20 | 118 | 54.90 | (P = 0.006) |

Time spent in playing by most children in our study was satisfactory. Only 11% of children spend less than 2 hours in playing while 42.7% spend 2 to 4 hours in playing and 46.3% spend 5 hours or more in playing. National Association for Sport and Physical Education (NASPE) guidelines recommend for preschool children to (engage in at least 60 minutes—up to several hours—of unstructured physical activity each day and should not be sedentary for more than 60 minutes at a time, except when sleeping) [24].

Although the world health organization (WHO) recommends exclusive breast feeding up to 6 months duration [25], we found in our study that only 20.7% of the mothers exclusively breastfed their babies, 68.6% were on mixed feeding, 10.7% of the mothers never breastfed their babies, and 26.3% have less than 6 months duration of breast feeding. Prevalence of exclusive breastfeeding was extremely low in our population while partial breastfeeding was the trend for feeding in the first 6 months of life; similar results were concluded from many studies done in Saudi Arabia which was accompanied with rapid decline in lactation duration [26, 27].

In this study we found that 65.3% of children were introduced solid food at age of 6 month or more while 34.7% of children were introduced before the age of 6 months. This means that still there is misconception about the proper age of introduction of solid food. WHO recommends introduction of solid food around the age of 6 month [28], and recent studies show that late introduction of food was associated with increased risk of allergic sensitization to food [29, 30] and inhalant allergens [29].

Regarding frequency of consumption of different food items, consumption of the following healthy items was noticeably rare among study participants: red meat (16%), white meat (9%), fish (25%), beans (49%), eggs (11.7%), and nuts (49.7%). Unfortunately consumption of the following unhealthy items was frequent (that is consumed most of the days) among study participants: pizza (26.4%), burger (25.3%), chocolate/desert (67%), butter-mayonnaise (25%), soft drinks (24%), juices (87%), chips (71.7%), and biscuits (78.3%).

In our group study, there was a positive relation between family income and biscuits eating. In 2003 Xia B showed that increased fast-food consumption was independently associated with higher household incomes [31]. Children living in nuclear families were found to consume more unhealthy items (pizza and burger) than children.
living in extended families. As extended families have members from old generation whom consuming homemade food more as shown in a study done in USA [32].

Children living in Qatif (rural area) were consuming less unhealthy items (burger and soda) than those living in Dammam (urban area). Colić-Barić et al. (2004) showed that Consumption of fast food and soft drinks was more prevalent in urban than rural area [33].

Strangely legumes (healthy food item) intake was lower among children of Qatif area. This can be explained by high prevalence of G6PD deficiency in this area.

Children attending nursery were consuming less deserts/chocolate and drinking more soft drinks in our study. Russell and Worsley (2007) showed that there were no significant associations between attending day care facility and children’s food preferences [34].

In our study we found that increasing meal frequency was associated with less frequent soft drinks, more frequent vegetables and legumes and that children who consume more snacks consume more fruit.

Regular meals are associated with improved dietary intake among family members [35]. For example, several large studies have shown that regular family meals are strongly associated with increased consumption of fruits, vegetables, and grains and also linked with lesser consumption of fried or fatty foods and soft drinks or other unhealthy food choices [36–40].

Bellisle (2007) stated that having up to 3 snacks a day can have a positive, rather than a negative, impact on health [41]. The study of Pedersen et al. (2012) showed significant association between irregular breakfast, lunch and evening meal consumption and low frequency of fruit intake and vegetable intake [42]. Lazzeri et al. (2013) showed significant relation between low fruit and vegetable intake and irregular breakfast habits. Similarly, low fruit intake was associated with irregular snack consumption [43].

5. Conclusion

Studying life styles, dietary behaviors, and factors that may affect them among preschool children provides benchmark about current situation. It provides health care workers and decision makers with important information that will help to improve health services especially by providing effective, preventive health education and health promotion services to improve situation in this vulnerable sector of the community.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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