PJN
ISSN 1680-5194

PAKISTAN JOURNAL OF NUTRITION

ANSInet
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorpjn@gmail.com

Pakistan Journal of Nutrition 10 (5): 492-499, 2011
ISSN 1680-5194

Nutrition and Eating Patterns among Preschoolers in Gaza Strip

Basil J. Kanoa[1], Amine T. Hamed[1] and Baker M. Zabut[2]
[1]College of Pharmacy, Al-azhar University-Gaza, Palestine
[2]College of Science, Islamic University of Gaza, Palestine

Abstract: The study aim to assess the nutrition and eating patterns among Preschool Age Children (PSC) in Gaza Strip. The study design was cross sectional study carried-out in the five governorates of Gaza Strip. The study population was preschool children that were chosen from eligible Kindergartens (KG). Official approval to conduct the research study was obtained from the ministry of education and higher education and consent form from parents to participate mother and coming to the KG was obtained. Data were collected through face to face interviews with the children's mothers. The questionnaire was designed to include two parts: sociodemographic part and food frequency of animal and plant product. The results showed that about 44% of the surveyed children were given milk once daily, while 11.2% of them did not receive it at all. About 32.9% of the surveyed children were give fish once per week while 8.8% did not receive it at all. With exception to meat either fresh, frozen or canned there is no statistical significance relationship between frequencies of eating liver, fish, eggs and milk in relation to governorates. The percentage of the surveyed children were given vegetables and fruits once daily were (71.1%, 53.1%) respectively. It was found that 7% are given fruits each two weeks or more. With exception to vegetables, there is statistical significance relationship between bread, rice, macaroni, fruits, legumes, sweets and fruit juices in relation to governorates.

Key words: Nutrition, eating patterns, preschool children, cross sectional study, Gaza strip

INTRODUCTION

Gaza is suffering from an economic crisis (UNDP, 2005). Most of the economic deterioration in recent years is due to the military siege and isolation of the population. Since the start of the second intifada, the income per capita has declined sharply and consistently by 12% in 2000, by 19% in 2001, 31% in 2002, 40% in 2003 in comparison to 1996 and 40% less than in 1999 (Report on Health sector review, 2007). The number of families falling below the poverty line was estimated at 33% in 1998 and 65% by July 2001 (Report on Health sector review, 2007). In 2004, the World Bank estimated that 47% of the population were below the poverty line (65% in Gaza), up form 20% in 1999, placing over 1,700,000 Palestinian below poverty line (UNRWA emergency appeal, 2008). The new report from UNDP indicated that the majority of the Gazan population, 65%, live below the poverty line and more than half of them, 37%, live in extreme poverty. Poverty rate of 65% means that out of estimated 1,416,543 Palestinians in the GS, about 920,750 live in poverty. Of those 524,120 live in extreme hardship (UNDP, Inside Gaza, 2009). Now the situation for 1.5 million Palestinians in the GS is worse and this situation in Gaza is man-made, completely avoidable and with the necessary political will, can also be reversed. The number of people living in absolute poverty in Gaza has increased sharply. Today, 80% of families in Gaza currently depend on humanitarian aid. This decline exposes unprecedented levels of poverty and the inability of a large majority of the population to afford basic food. As a result, food aid increased dramatically to meet the needs of this increasingly impoverished population. In 2008, there are over 1.1 million people, some three-quarters of Gaza's population, who are dependent on food aid (UNISPAL, 2009)

This study was done on kindergartens in the five governorates of GS. The number of eligible kindergartens in the GS is 280 distributed in the GS as follows 56 kindergartens in the north governorate (Ng), 98 in the Gaza city(GC), 37 in the mid-zone governorate(M), 49 in Khanyounis governorate(Kh) and 40 in Rafah governorate(Ra). There are 117 general kindergartens, 161 special kindergartens and only 2 governmental kindergartens. The number of PSC in the eligible kindergartens reached 23301 children (Ministry of Education MOE, 2008).

Description of the study area: The present study was done in the GS that is comprised of five governorates as follow: North governorate, Gaza city governorate, middle governorate, Khanyounis governorate and Rafah governorate.

North governorate: North governorate (Ng) constitutes 17% of the total area of GS and 1% of the total

Corresponding Author: Basil J. Kanoa, College of Pharmacy, Al-azhar University-Gaza, Palestine

Palestinian territory (61 sq. Km). The number of people living in north Gaza was 265,932 individuals in 2005 with capita per sq Km equal to 4,360 (MOH, 2009). This governorate consist of four areas; Beit Hanoun, Beit Lahia, Jabalia and Om-elnaser. People work in agriculture and trade. Education, health, sanitation and other services are provided mainly by the governorate.

Gaza city governorate: It constitutes 20.3% of the total area of GS and 1.2% of total Palestinian territory (74 sq. Km). The total number of people living in GC was 487,904 individuals in 2005 with capita per sq Km equal to 6,593 (MOH, 2009). People who live in Gaza City governorate (Gc) are mixture of local citizens and refugees. In general, the economic status of those who live in the city is better than those living in other areas in the GS. Mainly, people in Gc are employed in the governorate, local or international NGOs and private companies. Gaza economy depends on agriculture and light industry. The major agricultural products are citrus, olives, dates, flowers, strawberries and other vegetables and food products, plastics, construction materials, furniture, textile, garment and other traditional industries such as pottery, bamboo furniture, carpets, glass coloring, sea fishing and embroidery.

Mid-zone governorate: Mid-zone governorate (M) constitutes about 15% of the total area of GS and 1% of Palestinian territory area of (58sq. Km). The total number of people living in Mid-zone is 201,112 individuals in 2005 with capita per sq Km 3,467 (MOH, 2009).

Rafah governorate: Rafah governorate (Ra) located in the south of GS about 40 Km from the GC. There are 40 schools in Rafah under the supervision of UNRWA and 37 schools under the supervision of ministry of education and higher education. In Rafah there are 9 clinics under the supervision of government and UNRWA and there are three hospital and 2 universities (Rafah governorate, 2008).

Khanyounis governorate: Khan Younis Governorate (Kh) is located in the southern part of the Gaza Strip of the occupied Palestinian territories (oPt) by the Mediterranean Sea and is currently inhabited by a population of around 295,795 inhabitants. In Khan Younis City, wastewater is primarily generated from households and disposed of through more than 20,000 cesspits and is still being evacuated and collected by tanker vacuum trucks. At present, nearly 40% of the population of Khan Younis City is temporarily served by public sewerage collection system. But due to the absence of wastewater treatment plant, the collected wastewater is pumped to the existing main storm water box culvert, which in turn flows by gravity to a storm water infiltration pond located in the north-western side of Khan Younis City (Khanyounis governorate, 2008).

Nutritional status in Palestine: It's clear that the majority of health problems in Palestine are nutrition related. Therefore, nutrition issues have become one of the priorities of the Ministry of Health (MOH). Despite the lack of reliable information about the nutrition and health, there is a consensus among the health professionals that there are prevalent dietary related illnesses in the Palestinian community (MOH, 2001-2003). Food and feeding habits in the Palestinian culture need to be revised and faulty ones should be corrected. The characteristic features of food availability and dietary patterns in Palestine has an influence on the special socio-political setting that has prevailed in the area. This setting has historically been characterized by external aggression and consecutive occupations by several population groups for millennia. In addition, three of the worlds main religions have their origin here and are still all represented in the area. The creation of Israeli in 1948, forced Palestinian immigration and the following Israeli-Palestinian armed conflict gave rise to a problem of refugee, both external and internal to Palestine itself. The Palestinian economy is marked by a captive market, which among other things imply restrictions on export and imports, as well as opportunities to establish business ventures. Fragmentation of Palestinian land, unemployment, poverty, frequent and prolonged border closures all these factors represent a serious threat to food security and affect the nutritional status among Palestinian at the household and national level (MOH, 2001-2003). In the GS, there are few separate sectors working in the field of nutrition with limited work on child and maternal nutrition. These sectors lack cooperation among each other and with MOH. There is no official base-line data on nutritional status and there is a lack of assessment studies for many age groups. Therefore, Primary Health Care (PHC) and hospital records are the main source of data on nutritional status in Palestine (MOH, 1999-2003).

In GS there is little available data regarding nutrition. Few assessment studies targeted children under five and mother of reproductive age were done. Giacaman (1988) reported a rate of 41% of malnutrition in a sample of 209 children. The rate of malnutrition in that study was higher in females than in males (females 52% and males 32%). This was explained by the researcher to be cultural related factors that stress a preference for baby boys as opposed to baby girls. Furthermore, the researcher observed a positive relationship between age and malnutrition (malnutrition increased with age and was concentrated mainly around the weaning period). Through a study conducted by Terre des Hommes in 1995 to assess the nutritional status of Gaza children under five years old, it was found that 15.1% of the children were underweight (Wt/age), wasting was found in 5.7% of the sample (weight for height), stunting was found in 14.2% (height for age). A

significant association was found between nutritional status and education, sanitation, size of the family, number of meals per day, feeding practices and the socioeconomic status of the family (Kumar, 1995). Parvanta and their colleagues (1999) showed that the prevalence of stunting among the elementary school children was 5.5% and overweight 1.8%. In 2002, nutrition survey was carried out through technical and financial cooperation between Palestinian Central Bureau of Statistics (PCBS), Ministry of Health (MOH), institute of public health at Bir Zeit University and UNICEF on the hemoglobin levels, state of nutrition and growth parameter for children aged 6-59 months. The survey revealed that a small percentage of children were thin (2.9%) or wasted (2.0%), while 10.6% were stunted in the GS (PCBS, 2002). PCBS, in cooperation with the Pan-Arab Project for Family Health (PAPFAM), UNICEF and UNFPA, conducted the first Palestinian health survey in 2006 were the target population consisted of all Palestinian households that usually reside in the Palestinian territories indicated that mothers of all children born during the past five years, 97.5% were breastfed and the mean duration of breast feeding was 13 months (PCBS, 2006). Of children (0-5) months of age, 26.5% were exclusively breast-fed. The data analysis also revealed that 10% of children under five in the Palestinian territories suffered from stunting; this percentage is higher in the GS (13.2%) compared to the WB (7.9%) and the highest percentage was found in the north governorate (29.6%) (PCBS, 2006). In 1999, cross sectional descriptive study targeted preschoolers aged 4-5 years in the southern province of Palestine in order to figure out the health profile of these children and revealed that, severe malnutrition were almost not present but 18% of the male children were mildly underweight and about 2% were moderately underweight. In addition, 6.9% of the children were either moderately or severely short (Ziara, 1999). Skeik (2003) reported that stunting was more prevalent in Ng than in the GC (18.5%, 14.4% respectively).

Micronutrient deficiencies, which are a significant cause of malnutrition, are associated with ill health among populations. Deficiencies in vitamin A, iodine and iron are known to be prevalent and associated with a range of mild to severe effects. Laboratory based-study to establish national baseline information on nutritional status relative to vitamin A was done in the Gaza Strip GS and West Bank WB and targeted 1127 children aged 12 to 59 months, the results showed that 22% of children were found to have low vitamin-A plasma levels <200 microgram/L (MARAM project, 2004). In Palestine, iodine deficiency is more concentrated in villages (29.7%) than in cities (12.6%) or in camps (12.3%) (MOH, 2007). The prevalence of rickets among Palestinian children 6-36 months old in the GS was 4.1% where the higher percentage was recorded in Kh reached 7.6% (WHO, 2006). The prevalence of rickets among Palestinian children was 12.5% with variation among governmental (18.6%) and UNRWA clinics (MOH, 1997).

In a case-control study to record the biochemical changes associated with Nutritional rickets in children up to three years old in GS showed that rickets were more prevalent among children who delayed in having complementary feeding, less sun light exposure and living in flat (Mushtaha, 2006).

In 2008, a rapid assessment survey for assessing the nutritional status of children aged 6-59 months in three governorates of GS were done by Terre des Hommes and supported by UNICEF and revealed that 10.3% of the study sample were stunted, 2.5% underweight, 2.4% wasted. The same study concluded that a current economic crisis in GS has resulted in severe impacts on child's nutrition in the Gaza Strip (Abdeljwad and Humeid, 2008).

Measurements of daily eating patterns by using food frequency questionnaire: Traditionally used method, such as recalls, records and Food Frequency Questionnaire (FFQ) are not specifically suitable to collect information on the daily eating patterns of individuals, which may be essential (Lennernas and Andersson, 1999). In addition, meal pattern data from different dietary studies are difficult to compare because when subjects are asked to define meals, the classifications (e.g break fast, sandwich meal, snack and light meal) are often subjective and not reproducible (Sepp *et al*., 2006).

The assessment of an individual's diet is susceptible to many possible errors; theses include under-or over reporting by subjects, recall difficulties, measurement errors, calculation errors. Estimation of portion sizes may also introduce inaccuracies. Assessment may be prospective or retrospective.

Printed questionnaires are used and subjects (or interviewer) tick the category that approximates to their usual consumption of a list of foods, i.e never eaten, eaten once a month, eaten per week, once daily. FFQ can be interviewer led or self-administered. There are three types of FFQ qualitative (no portion size), semi-qualitative (standard portion size is used) and quantitative (record data on portion size). FFQ are suitable for large survey and it can focus on specific foods, e.g fruits and vegetables (Webster-Gandy *et al*., 2006).

MATERIALS AND METHODS

Study design: This is a cross sectional study carried-out in the five governorates of Gaza Strip.

Target population: The study population was preschool children aged 5-6 years old that were chosen from eligible Kindergartens (KG). The total number of children aged 5-6 years old in Gaza Strip 44322 children of both

refugee and citizen (Ministry of Education, 2008). The number of eligible KGs in GS was 280, distributed as follow 56 KG in north Gaza, 57KG in west Gaza, 41 KG in east Gaza, 37 KG in Middle, 49 KG in khanyounis and 40 KG in rafah.

Sampling method: The target population was Preschool Age Children (PSC), a list of eligible KGs to participate in the study where sample selected was carried out. This list included children from KG selected with a probability proportional to enrolment size.
The sample was selected through the following stages:

First stage: Determining of the KG and the total number of children in each KG out of each of the five governorates.

Second stage: Simple random selection of the KG to match the required number of children in each governorate in a proportional bases.

Third stage: Simple random selection of the children through the selection of one class out of every single KG regardless of its total size so the classes is our sample unit and in each class selected, every student chosen was interviewed with his/her mother.

Ethical consideration: Official approval to conduct the research study was obtained from the ministry of education and higher education after letter of request was sent. Children parents were given a full explanation in the Arabic language about the purpose of the study and confidentiality of the information and that participation was completely optional In addition, consent form from parents to participate mother and coming to the KG was obtained.

Questionnaire design: The questionnaire was designed to include two parts: food frequency of animal products and other of plant product. Face to face interviews were directly conducted between the researcher and children's mothers. Food frequency addressed in the questionnaire was qualitative categorized into once daily, once weekly, 2-3 times weekly, once per two weeks or more and never eaten.

RESULTS

Sociodemographic description of the study sample: Table 1 shows that the study sample consisted of 52.4% boys and 47.6% girls. About two third (67.4%) of the sample were refugees while 32.6% were local citizens. It was found that 42% of the study population was living in Gc, 14.0% in Ng, 16.3% in the M, 13.1% in Kh, 14.5% in Ra. The average number of residents in GS was 7.8. About 78.5% of surveyed children had a family member ranged from 4 to 9. In addition, about 20.1% of the surveyed children had family member's $\geq$10. The large family members by $\geq$10 were more evident in Gc (Data not shown).
About 51.3% of children's mother had a secondary level of education, while 24.5% had a preparatory education. Of these women 20% had university education level and less than 1% were illiterate. About sixty percent (60.1%) of surveyed children, had fathers with secondary 34.2% or preparatory 25.9% school educational. Of those men, 28.9% had university education, also less than 1% were illiterate. The percentage of illiterates among males was higher than females.
More than forty percent (41.3%) of the surveyed children had employed fathers, while 26.1% were un-employed. Only 2% of the total sample their father occupation were farmers. Regarding mother employment, it was found that 7% of the surveyed mother was employees while, 93% of them were home care and have no working activity out side the home. Approximately, half of the surveyed children's family had monthly income less than 1000 NIS and less than 20% had a family income more than 2000 NIS. Moreover 43.8% of the surveyed children's mothers did not have enough income to secure food for daily life. More than ninety percent (90.6%) of the surveyed children's families live in their owned houses and about 9.6% live, in rented houses.

Food frequency questionnaire: Table 2 points out the frequency of animal food intakes among PSC. The results showed that milk and milk products were introduced to the surveyed children with various proportions; about 44% of the surveyed children were given milk once daily, while 11.2% of them did not receive it at all. About 30% of the surveyed children received meat only once per week, 45.7% received eggs 2-3 weekly, 21.4% did not receive liver at all. About 32.9% of the surveyed children were give fish once per week while 8.8% did not receive it at all. With exception to meat either fresh, frozen or canned there is no statistical significance relationship between frequencies of eating liver, fish, eggs and milk in relation to governorates.
Table 3 illustrated the frequency of different plant food intakes among PSC. It was also found that 65.5% of the surveyed children were given legumes once per week or 2-3 per week. The percentage of the surveyed children were given vegetables and fruits once daily were (71.1%, 53.1%) respectively. It was found that 7% are given fruits each two weeks or more. More than thirty seven (37.8%) of the surveyed children were given fruit juices daily and (15.4%) did not receive juices at all. As for bread and cereals, 94.9% of the surveyed children were given bread and/or cereals at least once a day and about ninety percent (89.4%) of the surveyed children were given sweets, chocolate and candy once daily. With exception to vegetables, there is statistical significance relationship between bread, rice, macaroni, fruits, legumes, sweets and fruit juices in relation to governorates.

Table 1: Socio demo graphic variability's of the study sample in each Governorate

Socio-demographic variables	Ng N (%)	Gc N (%)	M N (%)	Kh N (%)	Ra N (%)	Total N (%)	p-value
Residential status							0.00
Refugees	75 (19.5)	147 (38.2)	55 (14.3)	32 (8.3)	76 (19.7)	385 (67.4)	
Citizen	5 (2.7)	93 (50.0)	38 (20.4)	43 (23.1)	7 (3.8)	186 (32.6)	
Total	80 (14.0)	240 (42.0)	93 (16.2)	75 (13.1)	83 (14.5)	571 (00.0)	
Mother education							0.00
Illiterate	0 (0.0)	2 (50.0)	0 (0.0)	1 (25.0)	1 (25.0)	4 (0.7)	
Primary	7 (35.0)	7 (35.0)	5 (25.0)	0 (0.0)	1 (5.0)	20 (3.5)	
Preparatory	18 (12.9)	71 (50.7)	21 (15.0)	9 (6.4)	21 (15.0)	140 (24.5)	
Secondary	35 (11.9)	130 (44.4)	44 (15.0)	37 (12.6)	47 (16.0)	293 (51.3)	
University	20 (17.5)	30 (26.3)	23 (20.2)	28 (24.6)	13 (11.4)	114 (20.0)	
Total	80 (14.0)	240 (42.0)	93 (16.2)	75 (13.1)	83 (14.5)	571 (00.0)	
Father's education							0.00
Illiterate	0 (0.0)	1 (20.0)	3 (60.0)	1 (20.0)	0 (0.0)	5 (0.9)	
Primary	7 (12.1)	35 (60.3)	7 (12.1)	4 (6.9)	5 (8.6)	58 (10.2)	
Preparatory	26 (17.6)	71 (48.0)	25 (16.9)	8 (5.4)	18 (12.2)	148 (26.0)	
Secondary	25 (12.8)	73 (37.4)	34 (17.4)	32 (16.4)	31 (15.9)	195 (34.2)	
University	22 (13.8)	60 (36.4)	24 (14.5)	30 (18.4)	29 (17.6)	165 (27.3)	
Total	80 (14.0)	240 (42.0)	93 (16.2)	75 (13.1)	83 (14.5)	571 (00.0)	
Mother occupation							0.09
Home care	75 (14.2)	227 (42.8)	88 (16.6)	64 (12.1)	76 (14.3)	530 (93.0)	
Employee	5 (12.2)	13 (31.7)	5 (12.2)	11 (26.8)	7 (17.1)	41 (7.0)	
Total	80 (14.0)	240 (42.0)	93 (16.2)	75 (13.1)	83 (14.5)	571 (00.0)	
Father occupation							0.00
Employee	27 (11.4)	84 (35.6)	41 (17.4)	40 (16.9)	44 (18.6)	236 (41.3)	
Worker	23 (14.0)	94 (57.3)	15 (9.1)	14 (8.5)	18 (11.0)	164 (28.7)	
Farmers	0 (0.0)	1 (9.1)	7 (63.3)	1 (9.1)	2 (18.2)	11 (2.0)	
Unemployed	29 (19.5)	57 (38.3)	30 (20.1)	15 (10.1)	18 (12.1)	149 (26.1)	
Death	1 (9.1)	4 (36.4)	0 (0.0)	5 (45.5)	1 (9.1)	11 (2.0)	
Total	80 (14.0)	240 (42.0)	93 (16.2)	75 (13.1)	83 (14.5)	571 (00.0)	
Family income							0.00
Less than 1000	48 (17.2)	130 (46.6)	44 (15.8)	25 (9.0)	32 (11.5)	279 (48.9)	
From 1000 to 2000	17 (9.3)	79 (43.2)	32 (17.5)	22 (12.0)	33 (18.0)	183 (32.1)	
More than 2000	15 (13.8)	31 (28.4)	17 (15.6)	28 (25.7)	18 (16.5)	109 (19.0)	
Total	80 (14.0)	240 (42.0)	93 (16.2)	75 (13.1)	83 (14.5)	571 (00.0)	
Food supply							
Sufficient	41 (12.8)	127 (39.6)	49 (15.3)	56 (17.4)	48 (15.0)	321 (56.2)	0.01
Insufficient	39 (15.6)	113 (0.0)	44 (17.6)	19 (7.6)	35 (14.0)	250 (43.8)	
Total	80 (14.0)	240 (42.0)	93 (16.2)	75 (13.1)	83 (14.5)	571 (00.0)	

DISCUSSION

The socioeconomic characteristics of the study sample: The present study described the eating patterns of PSC in the five governorates of GS. Socio-demographic and FFQ of animal and plant food were studied.

The results showed there were equal percentage of the males and females (52.4% Vs 47.6%). This characterized the Palestinian community that has almost equal percentage of male and female.

Moreover, 67.4% of the sample had refugee status. This finding was consistent with the actual distribution of refugee in the GS where 62.2% of GS population was refugees (PCBS, 2008). About forty percent (38.2%) of the refugee children lived in the GC governorate. This might be due to that GC is a mixture of citizen and refugees. In addition it contains a very big refugee camp which is Al-shatee refugee camp in the west side of the GC.

On the other hand, about 78% of the surveyed children had a family members ranged from 4 to 9. This finding was consistent with the characteristics of Palestinian community in GS.

Approximately, twenty percent (19.9 %%) of the surveyed PSC their mothers had university degree while, half of the mothers in the sample (51.3%) had secondary educational level and 24.5% had a preparatory educational level. These findings might reflect the perceived importance of higher educational level and encourage the females in the GS to higher educational level. Higher percentage of children's mothers with secondary and preparatory educational level reflected social phenomenon that Palestinian families tend to marry their daughters after the basic level of education.

In contrast, about thirty percent (28.9%) of the surveyed PSC, their fathers had university degree and 61% of them had either secondary or preparatory educational level. These findings indicated that males had higher percentage of university level in comparison with female. It was also found that 41.3% of the surveyed PSC, their fathers were employee and 26.1% were not employed.

Table 2: Frequency of giving the child milk, animal foods

Type of food	FFQ	Gc No (%)	NG No (%)	MG No (%)	Kh.G No (%)	RG No (%)	Total No (%)	p-value
Milk and milk products	1/d	105 (43.80)	39 (48.80)	36 (38.70)	32 (42.60)	39 (47.00)	251 (44.00)	0.2
	2-3/w	72 (30.00)	20 (25.00)	23 (24.70)	17 (22.70)	18 (21.70)	150 (26.30)	
	1/w	37 (15.42)	5 (6.25)	14 (15.00)	11 (14.60)	8 (9.60)	75 (13.13)	
	1/≥2w	11 (4.60)	6 (7.50)	4 (4.30)	5 (6.60)	5 (6.00)	31 (5.43)	
	Never	15 (6.30)	10 (12.50)	16 (17.20)	10 (13.30)	13 (15.60)	64 (11.00)	
Meat (frozen,	1/d	37 (15.40)	11 (13.75)	15 (16.13)	21 (28.00)	13 (15.70)	97 (16.98)	0.033
canned, fresh)	2-3/w	105 (43.80)	36 (45.00)	46 (49.50)	32 (42.70)	34 (41.00)	253 (44.30)	
	1/w	82 (34.20)	22 (27.50)	24 (26.00)	15 (20.00)	24 (29.00)	167 (29.20)	
	1/≥2w	13 (5.40)	5 (6.30)	8 (8.60)	3 (4.00)	8 (9.60)	37 (6.47)	
	Never	3 (1.25)	6 (7.50)	0 (0.00)	4 (5.30)	4 (4.80)	17 (2.97)	
Egg	1/d	63 (26.30)	28 (35.00)	46 (49.50)	29 (38.60)	37 (44.60)	203 (35.60)	0.05
	2-3/w	129 (53.80)	35 (43.80)	34 (36.50)	34 (45.30)	29 (35.00)	261 (45.70)	
	1/w	30 (12.50)	7 (8.75)	10 (10.70)	8 (10.60)	10 (12.00)	65 (11.40)	
	1/≥2w	7 (2.90)	8 (10.00)	1 (1.07)	3 (4.00)	3 (3.60)	22 (3.90)	
	Never	11 (4.60)	2 (2.50)	2 (2.20)	1 (1.33)	4 (4.80)	20 (3.50)	
Liver (frozen, fresh)	1/d	5 (2.00)	1 (1.25)	2 (2.15)	0 (0.00)	0 (0.00)	8 (1.40)	0.06
	2-3/w	26 (10.80)	13 (16.30)	18 (19.40)	7 (9.33)	5 (6.02)	69 (12.10)	
	1/w	85 (35.42)	28 (35.00)	27 (29.00)	29 (38.70)	25 (30.10)	194 (33.90)	
	1/≥2w	81 (33.80)	23 (28.80)	20 (21.40)	19 (25.30)	35 (42.20)	178 (31.20)	
	Never	43 (18.00)	15 (18.80)	26 (28.00)	20 (26.70)	18 (21.70)	122 (21.40)	
Fish (frozen,	1/d	5 (2.08)	2 (2.50)	1 (1.07)	0 (0.00)	1 (1.20)	9 (1.60)	0.24
canned, fresh)	2-3/w	21 (8.75)	12 (15.00)	17 (18.30)	9 (12.00)	10 (12.04)	69 (12.08)	
	1/w	72 (30.00)	28 (35.00)	34 (36.60)	20 (26.70)	34 (41.00)	188 (32.92)	
	1/≥2w	121 (50.40)	32 (40.00)	34 (36.60)	35 (46.70)	33 (39.80)	255 (44.65)	
	Never	21 (8.75)	6 (7.50)	7 (7.50)	1 (14.70)	5 (6.00)	50 (8.80)	

Table 3: Frequency of giving the child plant foods and sweets

Type of food	FFQ	Gc No (%)	NG No (%)	MG No (%)	Kh.G No (%)	RG No (%)	Total No (%)	p-value
Bread, rice, pasta	1/d	228 (95.00)	75 (93.80)	84 (90.30)	74 (98.7)	81 (97.60)	542 (94.90)	0.038
	2-3/w	4 (1.67)	4 (5.00)	9 (9.70)	0 (0.0)	2 (2.40)	22 (3.85)	
	1/w	1 (0.04)	1 (1.25)	0 (0.00)	1 (1.3)	0 (0.00)	7 (1.23)	
	1/≥2w	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.0)	0 (0.00)	0 (0.00)	
	Never	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.0)	0 (0.00)	0 (0.00)	
Legumes	1/d	37 (15.40)	19 (23.80)	5 (5.40)	9 (12.0)	10 (12.10)	80 (14.00)	0.018
	2-3/w	71 (29.60)	30 (37.50)	36 (38.70)	25 (33.3)	25 (30.10)	187 (32.80)	
	1/w	82 (34.20)	19 (23.80)	30 (32.30)	19 (25.3)	73 (44.50)	187 (32.80)	
	1/≥2w	41 (17.10)	10 (12.50)	16 (17.20)	15 (20.0)	9 (10.80)	91 (15.90)	
	Never	9 (3.75)	2 (2.50)	6 (6.50)	7 (9.3)	2 (2.41)	26 (4.50)	
Vegetables	1/d	164 (68.40)	65 (81.30)	68 (73.10)	53 (57.0)	59 (71.10)	409 (71.60)	0.06
	2-3/w	44 (18.30)	10 (12.50)	20 (21.50)	18 (19.4)	11 (13.30)	103 (18.03)	
	1/w	25 (10.40)	4 (5.00)	4 (4.30)	2 (2.2)	7 (8.40)	42 (7.35)	
	1/≥2w	5 (2.10)	1 (1.30)	1 (1.10)	0 (0.0)	5 (6.10)	12 (2.10)	
	Never	2 (0.80)	0 (0.00)	0 (0.00)	2 (2.2)	1 (1.20)	5 (0.87)	
Fruits	1/d	123 (51.30)	43 (53.80)	51 (54.80)	50 (66.7)	36 (43.40)	303 (53.10)	0.033
	2-3/w	64 (26.70)	19 (23.80)	23 (24.70)	15 (20.0)	18 (21.70)	139 (24.34)	
	1/w	34 (14.20)	8 (10.00)	12 (12.90)	4 (5.3)	20 (24.00)	78 (13.66)	
	1/≥2w	16 (6.70)	6 (7.50)	6 (6.50)	3 (4.0)	9 (10.80)	40 (7.00)	
	Never	3 (1.25)	4 (5.00)	1 (1.07)	3 (4.0)	0 (0.00)	11 (1.90)	
Sweet and chocolate	1/d	224 (93.30)	75 (93.80)	83 (89.20)	63 (84.0)	66 (79.20)	511 (89.40)	0.04
	2-3/w	4 (1.70)	2 (2.50)	6 (6.50)	4 (5.3)	9 (10.10)	25 (4.37)	
	1/w	9 (3.75)	2 (2.50)	1 (1.07)	4 (5.3)	4 (4.80)	20 (3.50)	
	1/≥2w	3 (1.25)	1 (1.25)	3 (3.20)	3 (4.0)	3 (3.60)	13 (2.27)	
	Never	0 (0.00)	0 (0.00)	0 (0.00)	1 (1.3)	1 (1.20)	2 (0.50)	
Fruit juice	1/d	98 (40.10)	30 (37.50)	37 (39.80)	31 (41.3)	20 (24.10)	216 (37.80)	0.002
	2-3/w	57 (23.80)	22 (27.50)	16 (17.20)	16 (21.3)	15 (18.10)	126 (22.10)	
	1/w	20 (8.30)	17 (21.25)	13 (14.00)	9 (12.0)	11 (13.30)	70 (12.25)	
	1/≥2w	22 (9.20)	7 (8.80)	14 (15.10)	8 (10.7)	20 (24.10)	71 (12.40)	
	Never	43 (18.00)	4 (5.00)	13 (14.00)	11 (14.7)	17 (20.50)	88 (15.40)	

1/d: once daily, 2-3/w: 2-3 per week, 1/w: once weekly, 1/≥2w: once per two week ore more

Lower percentage of employees were recorded in Ng (11.4%) and Kh (16.9%) compared with GC because higher options of occupations in the GC in comparison with other governorates.

Moreover, about half of the surveyed children's families (48.9%) belong to families with monthly income less than 1000NIS. This indicated that, there were a considerable proportion of families in the GS who did not have adequate monthly incomes which reflected the state of poverty in the Palestinian community (UNRWA, 2008). Abu Mourad (2004) reported that the Israeli siege and closure had a devastating impact on the economic situation of the Palestinians in general and the refugees in particular. The ability of Palestinian families to secure adequate nutrition for their families, in general and to their children in particular is threatened. On the other hand, 43.8% of the surveyed children, their mothers perceived that their family income was insufficient to secure food for the children and for the family. Nevertheless, this percentage was very logical because of low family income and effect of closure on GS increased the cost of the basic goods.

It's also showed that more than ninety percent (90.3%) of the surveyed children's families owned their households and 9.6% of PSC lived in rented households. These findings were consistent with the GS situation characteristics, where people preferred to live in their owned houses and abstained from renting houses, unless they did not have any other choices. These findings might indicate a good economic status but, in reality it's false because GS people preferred living in extended family setting where everyone claims ownership of the same house.

Food intake of the PSC: The results might indicate an inadequate amount of protein intake, iron and zinc for large proportion of children. These might have adverse effect in the future included Protein Energy Malnutrition (PEM) and immunity. Decreases in the amount of protein intake in the GS might be linked to the economic status and higher percentage of poverty especially in the last two years, in addition to the expensiveness of the meat. About 10% of the surveyed children were given meat either every two weeks or more or never eaten it. Meat especially fresh ones are more expensive where many people in GS depend on its alternatives.

It was also found that 65.5% of the surveyed children were given legumes once per week or 2-3 per week. These findings indicated that many families included legumes like lentils, beans and chick beans in the three meals daily. These people in GS depend on legumes as alternatives for meat for obtaining protein and iron. Legumes are less expensive than meat and it's preferred for poor people in GS.

It was also found that 71.6% of the surveyed PSC were given vegetables once daily, while 53.1% were given fruits once daily and 7% were given fruits each two weeks or more. 37.8% of the surveyed children were given fruit juices daily and 15.4% did not receive juices at all. In GS, vegetables are less expensive than fruits where little percentage of people can buy fruits on daily basis.

According to the food pyramids nutrition needs of PSC the children need 3 serving of vegetables and 2 serving of fruits at least on daily basis. Fruits and vegetables provide essential vitamins and minerals that are very important in the biochemical processes. Missing of fruits and vegetables means that PSC did not get enough fibers, vitamins, minerals. In this regard, it's important to support the family to choose the different nutrients from all the food groups to ensure the balanced diet in their meals. It seemed also that PSC suffer from deficiency of some vitamins and minerals that need further investigations (MARAM, 2004; Division of Public Health Nutrition and Education, 2000).

About 95% of the surveyed PSC were given bread and/or cereals at least once a day. These findings were very important and matched with the fact that bread and cereals constitute the backbone of any meal in the GS. About 89.4% of the surveyed children were given sweets, chocolate and candy once daily. Excessive use of sweets leads to tooth decay and increase opportunity of overweight. According to the food pyramids the preschoolers needs sweets daily but in small amounts.

Recommendations:

- Malnutrition among PSC appears to be really public health problem according to the results of nutrition and eating patterns in GS and interventions to improve children nutritional status must concern, not only children with malnutrition, but also their mothers. Interventions should include short-term emergency measures as well as long term development strategies with an understanding of the limitations, risks and benefits to each. Ultimately, a political solution that allows for the economic recovery of GS will need to be in place for any meaningful and sustainable improvement on the nutritional status of the population.
- Health education program should be started at primary and secondary levels which stress on enhance the awareness in the community and provide proactive outreach to families with moderate and severe malnourished cases.
- Future researches in regarding nutrition assessment among PSC are needed including biochemical and clinical examination is recommended to validate these results.

REFERENCES

Abdeljwad, H.M. and J.M. Humeid, 2008. Nutritional status of Palestinian children under five (6-59 months) in three governorates of the Gaza Strip: A rapid assessment study.

Abu Mourad, T.A., 2004. Palestinian refugee conditions associated with intestinal parasites and diarrhoea: Nuseirat refugee camp as a case study. Public Health, 118: 131-142.

Division of Public Health Nutrition and Education, 2000. Bureau of nutrition services, Texas department of health: Preschool nutrition module.

Giacaman, R., 1988. A profile of life and health in three Palestinian villages, Ithaca Press, London.

Health Sector Review. A summary report, 2007. Joint report on health sector review (HSR).

Khanyounis Governorate, 2008. Department of Planning.

Kumar, B., 1995. Assessment of the nutritional status of children under five in the Gaza strip. Terre Des Hommes (Ard El-Insan).

Lennernas, M. and I. Andersson 1999. Food based classification of eating episodes. Appetite, 32: 53-65.

MARAM project, 2004. Prevalence of vitamin A deficiency among children, aged 12-59 months, in the West Bank and Gaza Strip.

Mushtaha, R.F., 2006. Biochemical changes associated with nutritional rickets in children up to three years old in Gaza Strip. A thesis submitted as partial fulfillment of the requirement for the degree of master of biological science/medical technology. Faculty of science, Islamic University in Gaza, Palestine.

MOE, 2008. Palestinian Ministry of Education: Department of Kindergarten.

MOH, 1997. Palestinian Ministry of Health, Health Status in Palestine Annual Report.

MOH, 1999. Palestinian Ministry of Health, Health Status in Palestine Annual Report.

MOH, 2001. Palestinian Ministry of Health, Establishing a food and nutrition department in Palestine. Three years project proposal. Report No: 1.

MOH, 2003. Palestinian Ministry of Health. Health Status in Palestine Annual Report.

MOH, 2009. Palestinian Ministry of Health, Health Status in Palestine Annual Report.

MOH, 2007. Palestinian Ministry of Health, Health Status in Palestine Annual Report.

Palestinian Central Bureau of Statistics (PCBS), 2002. Nutrition Survey-2002, press conference on the survey results.

Palestinian Central Bureau of Statistics (PCBS), 2006. Palestinian family health survey in occupied Palestinian territories in cooperation with Pan-Arab Project for Family Health (PAPFAM), United Nations Children's Fund (UNICEF) and United Nations Population Fund (UNFPA).

Parvanta, I., D. Galuska and M.E. Simpson, 1999. Gaza nutrition survey, UNRWA and CDC.

Rafah Governorate, 2008. Department of Planning.

Sepp, H., M. Lennernas and L. Abrahamsson, 2006. Preschool children's meal patterns analyzed using the food-based classification of eating episodes model. Scandinavian J. Food Nutr., 50: 131-138.

Skeik, A.B., 2003. Prevalenc of wasting and and stunting among Governemental primary schoolchildren in Gaza governorate. A thesis submitted as partial fulfillment of the requirement for the degree of master of public health. School of public health, Al-Quds University, Palestine.

The Palestinian Central Bureau of Statistics, 2008. The Population, Housing and Establishment Census-2007, Press Conference on the Preliminary Findings, (Population, Buildings, Housing Units and Establishments), Ramallah, Palestine.

UNDP, 2005. Focus eye on Gaza: Gaza Great Challenges and Opportunities, Vol (3).

UNDP, 2009. Inside Gaza attitudes and perceptions of the Gaza strip residents in the aftermath of the Israeli military operations.

UNISPAL, 2009. United Nations information system on the question of Palestine.

UNRWA emergency Apeal, 2008. WWW.UNRWA.org.

Webster-Gandy, J., A. Madden and M. Holdsworth, 2006. Oxford handbook of nutrition and dietetics. Oxford University Press, pp: 40-42.

WHO, 2006. Prevalence and risk factors for rickets among Palestinian children 6-36 months old in Gaza Strip. In cooperation with Ard-elensan and MOH.

Ziara, S.M., 1999. Assessment of kindergarten children health, in southern provinces of Palestine, in the scholastic year 1998/99. A thesis submitted as partial fulfillment of the requirement for the degree of master of public health. School of public health, Al-Quds University, Palestine.