

## SERVING SOFT DRINKS BY MOTHERS FOR PRESCHOOLERS AND THEIR UNDERNUTRITION, BAGHDAD, IRAQ

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### ABSTRACT

**Introduction:** Undernutrition among children is still considered as a global health problem particularly in developing countries. In Iraq there are several inadequate feeding practices of the mothers toward their children (as serving soft drinks) which could be related to the nutritional status of them. **Objectives:** To identify mothers' practice in giving soft drinks for their preschoolers and the possible effects of that practice on their undernutrition. **Methods:** A mixed-method survey was carried out on 505 Iraqi preschoolers and their mothers, by filling questionnaire about practices of them in serving soft drinks for their children, and also by taking the anthropometric measurements of those children to determine their nutritional status. The open-ended qualitative data and the quantitative data were analyzed by statistical tests. **Results:** 20% of the preschoolers were suffering from undernutrition. Majority of mothers gave soft drinks for their preschoolers. The mean age of children in the beginning of that serving was 21.5 months. More than half of mothers thought that soft drinks have no benefit. Also more than half of them made restrictions toward drinking of those beverages. Most of them didn't store those drinks in their homes. There are significant associations between preschoolers' undernutrition with both of their ages at the beginning of serving them soft drinks and with mothers' restriction on consumption of those drinks. It is needed for encouraging mothers to avoid serving soft drinks for their children, and for banning on selling that drinks inside kindergartens.

**KEYWORDS:** Soft drinks, Undernutrition, Preschoolers, Carbonated beverages.

### INTRODUCTION

Preschool children constitute the most vulnerable segment of any community, and their nutritional status is a sensitive indicator of community health and nutrition. Undernutrition among them is one of the greatest public health problems in developing countries.<sup>[1]</sup> Undernutrition is a medical condition caused by an improper or insufficient diet, and it particularly includes the following forms: stunting, wasting, and underweight. It is chiefly prevalent in developing countries, where it affects one out of every three preschool-age children. It is an associated cause in about 50% of all deaths occurring among children in these countries.<sup>[2,3]</sup> Moreover, it affects physical growth, morbidity, mortality, cognitive development, reproduction, and physical work capacity of children. There are generally three main groups that influence childhood undernutrition in developing countries; maternal factors,

dietary factors, and socio-environmental factors. Mothers play multiple roles in the families that affect the health and well-being of all family members. In almost all societies around the world, they are assigned by custom to be the primary caregivers to children. Activities carried out by them "such as feeding practices, and seeking medical care" are crucial for their children's healthy development.<sup>[4]</sup> Concerning the maternal feeding practices and behaviors, there are several inadequate feeding habits and nutritional practices of the mothers toward their children in Iraq, as elsewhere, which could be related to the nutritional status of children. These behaviors might be affected by some factors such as socioeconomic status, educational status, nutritional knowledge, occupation, and age of mothers.<sup>[4]</sup> Among under-five children in Iraq, 4.4% have wasting, 11.5% have underweight, and 27.6% have stunting, according to Iraqi Ministry of Health.<sup>[5]</sup> The pre-school period is

considered as a suitable time to learn and improve good feeding practices for children. Mothers, through their feeding behaviors, can teach and encourage their preschoolers to make good feeding choices, and thus they can maintain a healthy nutritional status.<sup>[6]</sup> Carbonated beverages are effervescent drinks that release carbon dioxide under conditions of normal atmospheric pressure. They contain carbonated water, sweetener, and flavoring.<sup>[7,8]</sup> Carbonated soft drink consumption might lead to many health problems, as dental caries, lower intakes of milk, calcium, and other nutrients.<sup>[9,10]</sup> Also soft drink might increase risk of several medical problems, as diabetes mellitus, cardiovascular risk, and susceptibility for bacterial contamination,<sup>[11,12,13]</sup>

This study aims to identify and describe local practice among Iraqi mothers in serving carbonated beverages for their preschoolers and the possible effects of that practice on their undernutrition status.

## METHODOLOGY

A mixed-methods (quantitative and qualitative) survey study carried out in selected primary health care centers in Baghdad; the capital of Iraq. Iraqi mothers who were bringing their preschool children (3-5 years old) and attending the maternal and child care unit within the selected primary health care center at the time of the study "for medical advice as a patient, or visiting the center for immunization or just for a routine checking" and accepted to participate were included. Mother that her preschool child had any gross congenital anomaly or chronic disease or mother who was not the primary care giver for her child was excluded in the study. The questionnaire was filled by the researcher through direct interview with the participating mothers and their preschool children, it included: (1) Behaviors and practices among mothers in serving carbonated

beverages for their preschoolers, (2) Nutritional status of the preschoolers which was located by taking the anthropometric measurements of them, with determination of both type and grade of child's undernutrition "if existed". This determination was based on the World Health Organization growth charts that classify undernutrition into: moderate or severe wasting, moderate or severe stunting and moderate or severe underweight.<sup>[14]</sup> Each questionnaire was assigned a serial identification number. Data were coded, entered, and analyzed by the researcher using computer software SPSS programme. The gathered open-ended qualitative data were analyzed first through a general review and reading of the overall data entirely for general understanding, and then labeling of those data was done through coding texts, classification, summarization, and tabulation of the data. Both the qualitative and quantitative data were summarized and presented as frequency and percentage, by using tables and charts. t-test analysis was used to study the statistical significant differences in mean scores for different groups of continuous variables. Chi-square ( $\chi^2$ ) test was performed to assess statistical association between the dependent variable (i.e. preschoolers' nutritional status) and the independent ones (i.e. the other elements and factors). In all statistical analyses, a p-value of  $\leq 0.05$  was considered to be significant. As an ethical consideration, a brief discussion about this study and its possible benefits was done and the data were collected anonymously with assured confidentiality.

## RESULTS

This study included a total of 505 of pre-school children with their mothers. 20% of the studied children were suffering from undernutrition; among them, 60.5% had stunting, 26.7% had wasting, and 12.8% were under weight, as appeared in details by table (1).

**Table (1): Frequency distribution and percentage of each type of undernutrition among preschoolers who were suffering from it.**

Type of undernutrition	Severity	Frequency (n=101)	Percent %
Wasting	Moderate wasting	22	21.8
	Severe wasting	5	4.9
Stunting	Moderate stunting	45	44.6
	Severe stunting	16	15.9
Underweight	Moderate underweight	10	9.9
	Severe underweight	3	2.9

Concerning the behaviors of Iraqi mothers in serving carbonated drinks for their preschool children, 89.5% were giving those drinks unfortunately!. It is

demonstrated by figure (1) that the mean age of the beginning of serving carbonated beverages for preschoolers by their mothers was 21.5 months.

Preschool's mean age in giving carbonated beverages by their mothers (in months).

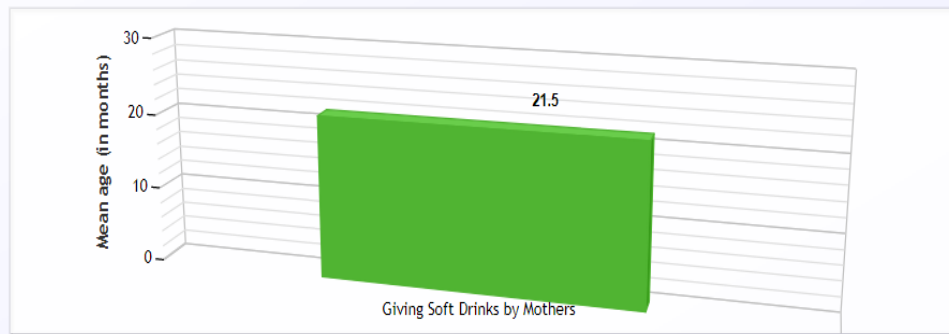


Figure (1): Preschool's mean age in beginning of serving carbonated beverages for them by their mothers (in months), N=505.

Regarding the mothers' points of view about importance of drinking carbonated beverages by their preschool children, the answers of those open-ended qualitative

questions were re-arranged, categorized, and manifested by table (2).

Table (2): Thinking of mothers about importance of carbonated beverages for their preschoolers (after categorization of the answers).

Thinking about importance of carbonated beverages:	Frequency (N=505)	Percent %
No benefit of them	259	51.3
They are generally harmful	228	45.1
They harm bones	10	2
No benefit and no harm of them	5	1
I don't know	3	0.6

This study showed that 27.1% of mothers did store carbonated beverages in their homes. Regarding types of the stored beverages, the majority among them were

either cola or combinations of cola with other types, as appeared by figure (2).

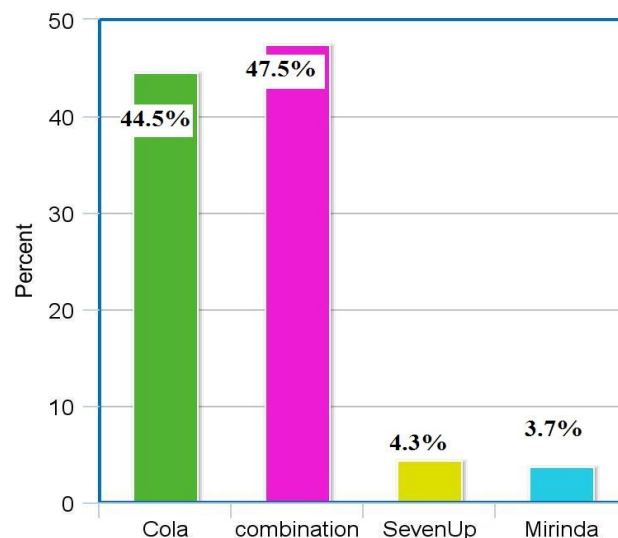


Figure (2): Types of carbonated beverages that are stored by the mothers in their homes, n=137.

Among the enrolled mothers, 53.7% of them made restrictions on their preschool children toward drinking of carbonated beverages.

The answers of the open-ended qualitative questions about reasons of restriction and not restriction of mothers

toward drinking of that beverages are listed in table (3) and table (4) after categorization of them.

**Table (3): Causes that make mothers to restrict drinking of carbonated beverages by their preschoolers (after categorization of the answers).**

Reason	Frequency (n=271)	Percent %
They are harmful	222	81.9
They have no benefits	49	18.1

**Table (4): Causes that make mothers not to restrict drinking of carbonated beverages by their preschoolers (after categorization of the answers).**

Reason	Frequency (n=234)	Percent %
I can't control my child wish	220	94
Child doesn't eat except with drinking of carbonated beverages	5	2.1

It's shown by table (5) that there is a significant association between groups of preschool children with undernutrition and those without it regarding their ages

at beginning of serving carbonated beverages by their mothers.

**Table (5): Comparison between preschoolers' undernutrition and their ages at beginning of serving carbonated beverages by their mothers.**

Variable	Undernutrition status	Number (N=505)	Mean $\pm$ SD (months)	t-test	p-value
Child age at giving carbonated beverages	Children with undernutrition	146	18.06 $\pm$ 6.83	5.68	0.000*
	Children without undernutrition	359	22.46 $\pm$ 8.28		

\*: significant

Also it was revealed that there is a significant association between preschoolers with undernutrition and those without it regarding restriction of their mothers toward drinking carbonated beverages, while there are no

significant associations between preschoolers with undernutrition and those without it regarding both giving carbonated beverages by their mothers and storage of that beverages at home, as showed by table (6).

**Table (6): Comparison between preschoolers with and without undernutrition regarding giving carbonated drinks, storage of them, and restriction on drinking them.**

Variable		Children with undernutrition (n=101)	Children without undernutrition (n=404)	$\chi^2$ df	p-value
Giving of carbonated beverages	No	8	45	0.891 1	0.345
	Yes	93	359		
Storage of carbonated beverages at home	No	78	290	1.212 1	0.271
	Yes	23	114		
Restriction on drinking carbonated beverages	No	60	174	8.672 1	0.003*
	Yes	41	230		

\*: significant

## DISCUSSION

The percentage of undernutrition among the enrolled preschool children by this study was 20%. This is approximate to a study done in 2009 and found that the prevalence of undernutrition among preschoolers in Baghdad, Iraq was 18.2% [15]. The interesting point is that the majority of Iraqi mothers in this work had giving carbonated beverages for their preschoolers, although these drinks are non-nutrient and unhealthy! Unfortunately, the mean age of preschoolers at beginning of serving carbonated drinks for them by their mothers was less than two years! More than half of the studied mothers were thinking that carbonated drinks have no benefit.. despite that, they continue giving these drinks!

This study showed that there is a significant association between child age at giving of carbonated beverages by the mother with the nutritional status of the child. This reflects the bad behavior of Iraqi mothers in serving soft carbonated drinks for their children! Among the studied mothers, 72.9% were not storing any type of carbonated beverages inside their homes, which is considered as a good point even if it was not appeared to have a significant association with child's nutritional status, although the others were storing more cola drinks, which of course have more bad effects on the health of children. It was appeared by this work that more than half of the studied mothers had restriction toward drinking of carbonated beverages by their children, and the number of mothers who had no limitation for drinking of those

beverages by their children was more than those who did restrict so drinks among the malnourished children. This relation was appeared to be significant. The majority of those who had restrictions on their children to drink carbonated beverages said that these beverages are harmful, while the majority of mothers who did not impose restriction said that they had no control on wishes of their children to select carbonated drinks. This possibly reflects the differences in the nutritional view and concepts between mothers in Iraqi society.

**Limitations of the study:** (1) Because the design of this work is mixed and it included multiple answers in its questionnaire, categorization and coding of the qualitative data might produce less-flexible data. (2) The study was carried out in primary health care centers, so it might be exposed to selection bias.

## CONCLUSIONS

Undernutrition among preschoolers in Iraq still constitutes a big health problem. The majority of studied mothers were serving carbonated soft drinks for their preschool children, and such behavior had begun and arisen in large proportion of mothers below child age of two years. Although many of mothers knew that serving those drinks for children is unhealthy, but they still offered them. About three fourths of mothers didn't store carbonated beverages in their homes; however, the cola type was the most stored drink among the rest. More than half of the studied mothers had restriction in allowing their children to drink carbonated beverages. So it is needed for encouraging mothers to pay a maximal attention to avoid serving carbonated beverages for their children, also it is necessary to make a coordination between Ministry of Health and Ministry of Education in Iraq for banning on selling the non-nutrient food and drinks "as carbonated beverages" inside kindergartens and to focus on this topic via television channels, radio stations, and social media.

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