

Knowledge of the paramedical staff toward food additives at Baghdad city

Tabarak Ayad Noori, Kadija Shaban Hassan, Omar Sadik Shalal* & Eman Abdul Hakeem Amear
Middle Technical University, College of Health and Medical Techniques, Baghdad, Iraq

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ABSTRACT

Background: Food additives (FA) are substances added to food for multiple determinations during different stages of its preparation. They are not ingested as food. They may or may not have nutritional value, but they are used to preserve the flavor, smell, structure, appearance and other properties of food. **Objective:** To determine knowledge of paramedical staff toward food additives. To define the association of different demographic variables of paramedical staff with their knowledge. **Patients and Methods:** A cross-sectional study was conducted in 5 Government institutions, in Baghdad city, for the period 16th November-2022 ending in 2nd March-2023. Inclusion Criteria Health workers specialized in the food authorities in government institutions were selected non-randomly in Baghdad city. Exclusion Criteria Medical staff and another staff which non-specialized in the food authorities in government institutions. Sampling Technique of the Study; the total number of government institutions was 5, that contains units specialized in the food authorities. **Results:** A sample of 127 health workers of age mean \pm SD (40 ± 11 years), 52 male the remaining were female; the majority of staff 55.1% had Bachelor degree. The years of service of the participant ranged from less than ten to 30-39 years with a mean \pm SD (14 ± 11 years). Overall score for knowledge was acceptable 94 (74.0%). Information source about food additives the highest percentages reported was from internet 72.4% In addition, others were obtained information from different sources. There is a significant difference in statistical analysis at $P < 0.05$ among knowledge score and years of services, the study observation that most health workers had a good knowledge in less than ten years and ten to ninety years were accounted 19 (63.3%), 7 (23.3%) respectively. **Conclusion:** The study revealed that paramedical staff in Baghdad city had Acceptable score knowledge with regard to food additives. The study demonstration a highly significant relationship between health worker's knowledge with years of services.

*Corresponding Author:

*Omar Sadik Shalal

Middle Technical University, College of Health and Medical Techniques, Baghdad, Iraq

E-mail: Omar.sadik@mtu.edu.iq

1- INTRODUCTION

The earliest documentation of food additives can be found in papyri from Ancient Egypt, dating around 1500BC. As of right now, the European Union has allowed the use of over 320 food additives [1]. Food additives are

substances added to food in order to preserve or enhance its freshness, flavor, texture, appearance, or safety. Certain food additives, like salt (used in meats like bacon or dried fish), sugar (used in marmalade), and sulfur dioxide (used in wine), have been used for preservation for millennia [2]. Food additives, which can be either natural or synthetic, are derived from plants, animals, or minerals. They are intentionally added to food to achieve specific technical purposes that are often overlooked by consumers. There are several thousand food additives in use, each serving a distinct function to make food safer or more appealing. According to the World Health Organization (WHO) and the Food and Agriculture Organization (FAO), food additives are categorized into three broad groups based on their function; flavoring agents, enzyme preparations, and other additives are available [3]. The primary role of food additives classified as acids and alkalis (bases) is to inhibit the growth of bacteria and other harmful microbes in food, thereby preserving its properties. They function as acidity regulators and pH control agents [4]. Food flavors Food additives may include various metabolites, such as monosodium glutamate and nitrous compounds, which have been identified as carcinogenic. The toxicity or benefit of these compounds depends on how they are absorbed, eliminated, or metabolized by the body. Determining safe consumption limits for humans is further complicated by the interactions between multiple substances. In the field of nutrition, the potential toxicity of new chemical compounds means they should be considered harmful until proven safe. Additionally, food additives can sometimes degrade vitamins in food; for instance, adding caramel to food has been linked to a deficiency in vitamin B6 [5]. On the other hands they are used to make bad quality food look good [6]. Many people may experience allergic reactions from them, including diarrhea, skin rashes, stomach problems, vomiting or elevated body temperature. Moreover, it can eliminate food's nutritive value [7]. Several food colorings have been prohibited because of their propensity to result in tissue damage and cancer. It has been demonstrated that eating food containing tartrazine can result in a wide range of adverse consequences and allergic reactions in people. These include eczema, various skin rashes, migraines, anxiety, asthma attacks, blurred eyesight, and thyroid cancer [8]. Nowadays, natural occurring toxicants, contaminants, and veterinary medications in food are elevated by the Joint Expert Committee on Food Additives (JECFA). Furthermore, there are several organizations that operate similarly; to name just a few, these include the USFDA, the EC, and the JECFA in Australia and New Zealand [9]. Increasing awareness among medical staff specializing in nutrition lead to improve awareness among consumers regarding food additives, their advantages, disadvantages, and appropriate quantities that are allowed to added. No studies have ever investigated the attitude and practice of HCW towered food additives in Baghdad city. **Aims of the study:** To determine knowledge of paramedical staff toward food additives. To define the association of different demographic variables of paramedical staff with their knowledge.

2- MATERIAL AND METHOD

Administrative Arrangement: Before collecting data, were obtained necessary approvals and official permission from the Iraqi Ministry of Health, Ministry of Environment and Ministry of planning. **Study Design:** A cross sectional study was conducted in 5 Government institutions in Baghdad city, for the period 16th November-2022 ending in 2nd March-2023. **Inclusion criteria:** Health workers specialized in the food authorities in government institution were selected non-randomly in Baghdad city. **Exclusion criteria:** Medical staff and another staff which non- specialized in the food authorities in government institutions. **Sampling techniques of the study:** The total number of government institutions was 5 institutions, that contains units specialized in the food authorities.

Names of institutions		No. of HCWs
1	Iraqi Ministry of Health/ Public health directorate/ Central public health laboratory	33
2	Iraqi Ministry of Health/ Public health directorate/ Nutrition research institute	24
3	Iraqi Ministry of Health/ Public health directorate/ Health audit department	33
4	Ministry of Environment/ Radiation protection center	13
5	Ministry of Planning/ Central Organization for Standardization & Quality Control	24
Total		127

Questionnaire form: The questionnaire was created and designed by the researcher following a thorough review of relevant books and existing literature. It was translated into the Arabic language; the questionnaire consisted of parts include: Respondent demographics' characteristics: the question in this module contains 5th items for measuring the age, gender, years of service, educational level & work place. **Knowledge module:** This module contains 42th questions; each has many choices measuring knowledge about food additives and its role. **Knowledge score:** Knowledge was assessed using questionnaire for knowledge assessment. This perform of (42) questions include multiple choice and yes, no, don't know (DNW) answers. A score of 1 was given for negative knowledge, 2 for don't know "natural responses" and 3 points were given for each correct response to positive knowledge (Likert respondent

scale) so the maximum score for knowledge 126. A score (≥ 105) was considered good, (104-84) acceptable, and (< 84) was taken as weak. **Statistical analysis:** Data analysis was performed using the Statistical Package for Social Sciences (SPSS) version 25. The data were summarized using simple statistical measures including frequency, percentage, mean, standard deviation, and range (minimum to maximum values). The Pearson Chi-square test was used to assess the significance of differences in qualitative data. Statistical significance was determined based on a p-value of 0.05 or less.

3- RESULTS

Table (1) showed the distribution of demographic characteristics of health worker, their age ranged from ($< 25 - \leq 55$ years) with a mean \pm SD (40 ± 11 years), the highest percentage 32.3% were in age group 25- 34 years and the lowest percentage 6.3% were in age group < 25 years. Regarding the gender of the participant, most health workers 59.1% were female. Regarding educational level of participants, the majority of staff 55.1% had Bachelor degree. The years of service of the participants ranged from less than ten to 30-39 years with a mean \pm SD (14 ± 11 years), the maximum of them 40.2% had more than ten years whereas the minimum 9.4% spent 30-39 year in the medical field.

Table (1): Distribution the participants according to demographic characteristics:

Variables	No	%	
Age	<25	8	6.3
	25-34	41	32.3
	35-44	32	25.2
	45-54	32	25.2
	≤ 55	14	11.0
	Mean \pm SD	(40 \pm 11 years)	
Gender	Male	52	40.9
	Female	75	59.1
Years of services	<10	51	40.2
	10-19	34	26.8
	20-29	30	23.6
	30-39	12	9.4
	Mean \pm SD	(14 \pm 11 years)	
Educational level	Secondary	1	0.8
	Institute	38	29.9
	College	70	55.1
	Higher education	18	14.2
Work place	Radiation protection	13	10.2
	Nutrition research institute	24	18.9
	Central Organization for Standardization & Quality Control	24	18.9
	Central public health laboratory	33	26.0
	Health audit department	33	26.0

Overall score for knowledge in table (2) in which accounted 3 (2.4%) from participant were weak knowledge about food additives, the majority of health workers 94 (74.0%) were acceptable knowledge, while 30(23.6%) have a good knowledge.

Table (2): Knowledge score of food additives of study sample

Score	Weak		Acceptable		Good	
	No.	%	No.	%	No.	%
Knowledge score	3	2.4	94	74.0	30	23.6

Regarding to subject of asking about information source about food additives table (3) illustrates that internet registered high percentage among health workers, and were accounted (72.4%) followed by study and read were accounted (60.6%), as well as the (40.9%) among participant who answered social media and (40.2%) answered health

staff. In addition, 35.4%, 22.8% and 21.3% among subjects have information source from educational posters, friends, university and television, respectively. Fewest percentages 12.6% get the information from their relatives.

Table (3): Distribution of percentages according to source of information about food additives.

Source of information	No	%
Internet	92	72.4
Study & read	77	60.6
Social media	52	40.9
Health staff	51	40.2
Educational posters	45	35.4
Friends	30	23.6
University	29	22.8
Television	27	21.3
Relatives	16	12.6

To reveals the association between demographic data of health workers who participant in study and knowledge score table (3) show significant difference in statistical analysis at $P < 0.05$ among knowledge score and years of services, the study observation that most health workers had a good knowledge in less than ten years and ten to ninety years were accounted 19(63.3%), 7(23.3%) respectively.

Table (4): Association between knowledge score with demographic variables.

Demographic variables		Knowledge Score						P-value
		Weak		Acceptable		Good		
		N	%	N	%	N	%	
Age group	<25	0	0.0	4	4.3	4	13.3	0.102
	25-34	0	0.0	27	28.7	14	46.7	
	35-44	1	33.3	24	25.5	7	23.3	
	45-54	1	33.3	29	30.9	2	6.7	
	≤55	1	33.3	10	10.6	3	10.0	
Years of services	<10	0	0.0	32	34.0	19	63.3	0.014*
	10-19	0	0.0	27	28.7	7	23.3	
	20-29	2	66.7	26	27.7	2	6.7	
	30-39	1	33.3	9	9.6	2	6.7	
Gender of cases	Male	2	66.7	41	43.6	9	30.0	0.275
	Female	1	33.3	53	56.4	21	70.0	
Educational level	Secondary	0	0.0	1	1.1	0	0.0	0.458
	Institute	2	66.7	30	31.9	6	20.0	
	College	1	33.3	52	55.3	17	56.7	
	Higher education	0	0.0	11	11.7	7	23.3	
Work Place	Radiation protection center	0	0.0	11	11.7	2	6.7	0.119
	Nutrition research institute	0	0.0	21	22.3	3	10.0	
	Central Organization for Quality Control & Standardization	0	0.0	21	22.3	3	10.0	
	Central public health laboratory	1	33.3	19	20.2	13	43.3	
	Health Audit department	2	66.7	22	23.4	9	30.0	

4. DISCUSSION

Food additives are compound added specifically for technological purposes during the production, processing, preparation, packaging and transportation of food; they are not ingested as food. They might or might not have nutritional value but they are used to preserve the flavor, smell, appearance, structure and other properties of food [10,11]. “Substances added intentionally to foodstuffs to perform certain technological functions for example to color, to sweeten, or to help preserve foods” is how the European Food Safety Authority defines food additives [12]. The 21st century’s shifting living conditions led to changes in food production and consumption, which in turn brought about the introduction of new dietary trends. As a result, the use of food additives has increased due to both the ever-evolving technology and the shifting nature of both the home and workplace in society.

Knowledge of paramedical staff toward food additives:

More than half of the participants answered correctly regarding item knowledge about food additives. The majority of participants answered correctly regarding item knowledge about food additives. The majority of the participants were classified as having an acceptable knowledge score 74%. This result was not similar in Iran that observed the total knowledge score was poor [13]. These differences in results may be due to their sample was about consumers who revealed that did not have enough information. The most correctly answered question was associated with “natural food additives are safer than industrial food additives” followed by “what is the role of food additives”. Other previous study that observed the respondents in that study was most correctly answered question which associated with general information about food additives in food [13]. The resent study revealed that most personnel had limited information about food additives and the products that contain food additives. In similar previous study, the respondents did not recognize the food additives such as MSG and sodium salt of nitrite [14]. In addition, 57.5% followed by 55.9% of health workers answered don’t know about “Foaming agent are substances that result in a homogenous dispersion of the gaseous phase in liquid or solid foods” and “Gelatinization in food is achieved by adding substances called gelling agents” respectively, while other previous study done in South Korea that observed participants in that study were worried about to preservatives among the studied additives such as colorants, flavor enhancers and sweeteners [15].

Source of information about food additives:

With respect to the source of information the results have been showed each health workers of studied sample might have one or more from different source of information about food additives. Th majority 72.4% of health workers consider internet as the major source of information, while other previous study done in the UAE that observed the respondents in that study used TV/ broadcasts 57.1% [16].

Association between knowledge score with demographic variables.

Our study demonstration there was significant association between knowledge score and years of services, the study observed that most health workers had a good knowledge in less than 10 years. This result disagreed with results A study conducted in China found that individuals with higher education levels were more concerned about food additives, while those with lower education levels showed more trust in national or international standards. Additionally, the research indicated that consumers with lower education had a greater interest in and need for information about food additives compared to those with higher education [17].

5. CONCLUSION

The study revealed that paramedical staff in Baghdad city had acceptable score knowledge with regard to food additives. The study demonstrated a highly significant relationship between health workers with years of services.

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معرفة الكادر الطبي تجاه المضافات الغذائية في مدينة بغداد

الخلاصة

المضافات الغذائية هي مواد تضاف إلى الغذاء لأغراض متعددة خلال مراحل مختلفة من تحضيره. ولا يتم تناولها كطعام. يمكن ان تكون لها قيمة غذائية أو لا، ولكنها تستخدم للحفاظ على نكهة الطعام ورائحته وبنيتة ومظهره وخصائصه الأخرى. أهداف الدراسة: التعرف على مدى معرفة الطاقم الطبي تجاه المضافات الغذائية. تحديد ارتباط المتغيرات الديموغرافية المختلفة للعاملين في المجال الصحي بمستوى معارفهم. المنهجية: أجريت دراسة مقطعية في 5 مؤسسات حكومية في مدينة بغداد للفترة 16 تشرين الثاني (نوفمبر) 2022 وتنتهي في 2 آذار (مارس) 2023. تشمل معايير الانضمام للدراسة، العاملين الصحيين المتخصصين في المجالات الغذائية في المؤسسات الحكومية وتم اختيارهم بشكل غير عشوائي في مدينة بغداد. تشمل معايير الاستبعاد من الدراسة الكوادر الطبية وطواقم أخرى غير متخصصة في المجالات الغذائية في المؤسسات الحكومية. أسلوب أخذ العينات للدراسة بلغ إجمالي عدد المؤسسات الحكومية 5 مؤسسات تحتوي على وحدات متخصصة في الهياكل الغذائية. النتائج: عينة مكونة من 127 عاملاً صحياً متوسط أعمارهم و انحراف معياري 40 ± 11.0 سنة، 52 ذكراً والباقي إناث، وأغلبية الموظفين 55.1% حاصلون على درجة البكالوريوس. تتراوح سنوات خدمة المشاركين من أقل من عشرة إلى 30-39 سنة بمتوسط 14 و انحراف معياري $11.0 \pm$ سنة وكانت النتيجة الإجمالية للمعرفة مقبولة 94.74.0%. درجة المعلومات حول المضافات الغذائية أعلى النسب المبلغ عنها كانت من الإنترنت 72.4% بالإضافة إلى ذلك، حصل آخرون على معلومات من مصادر مختلفة مثل الملصقات التعليمية والأصدقاء والأقارب والجامعة والتلفزيون. هناك فرق كبير في التحليل الإحصائي عند $P > 0.05$ بين درجة المعرفة وسنوات الخدمة، وقد بلغت ملاحظة الدراسة أن معظم العاملين الصحيين لديهم معرفة جيدة الذين لديهم خدمة في المؤسسات الصحية أقل من عشر سنوات ومن عشر إلى تسعة عشر سنة (63.3%)، 7 (23.3%) على التوالي. الاستنتاجات: كشفت الدراسة أن العاملين في المجال الصحي في مدينة بغداد لديهم درجة مقبولة من المعرفة فيما يتعلق بالمضافات الغذائية. وأظهرت الدراسة أيضاً وجود علاقة هامة للغاية بين معرفة العاملين الصحيين بالمضافات الغذائية وسنوات الخدمة.