



ORIGINAL ARTICLE

Dietary Supplement and Prescription Omega-3 Fatty Acid Products Use among Iraqi Consumers in Kirkuk City

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ABSTRACT

Background: Omega-3 fatty acid products are available as dietary supplements (fish oils) and prescription formulations (omega-3 ethyl ester, icosapent ethyl, omega-3 ethyl ester A, omega-3 carboxylic acids). The study aimed to learn more about the prevalence of dietary supplement and prescription omega-3 products use by Iraqi consumers in Kirkuk City, to record the types of products used and to examine the role of physicians and pharmacists in guiding choices about these products.

Methods: A cross-sectional questionnaire-based study was conducted among pharmacists concerning dispensing the prescription only medicine (POM) and over the counter (OTC) omega-3 products. Ninety-three filled questionnaires were received from pharmacies in Kirkuk city.

Results: Over 6 months, 43 patients from 93 (46.2%) were dispensed fish oil supplementations by prescription, and 50 patients from 93 (53.7%) were dispensed fish oil preparation without prescription. The nonprescription users were younger (32.92 vs. 44.41 years old) and more often female (63% vs. 58%) compared to prescription users. 44% of the OTC group purchased omega-3 as a dietary supplement, 20% used it for hair loss, 14% for treating hypertriglyceridemia, 0.08% for improving memory function, and 0.02% for pregnancy care. All the products supplied to customers for various indications either by prescription or as an OTC were dietary supplements.

Conclusion: Healthcare providers and consumers need to distinguish the differences between prescription omega-3 products and nonprescription omega-3 dietary supplements to ensure the appropriate use of each product.

Key words: Omega-3 fatty acids; Dietary supplements; Over the counter.



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INTRODUCTION

In recent years there has been an increasing tendency to use omega-3 fatty acid preparations because of their various roles in health promotion and disease risk reduction [1].

The omega-3 polyunsaturated fatty acids (PUFAs) include α -linolenic acid (ALA), stearidonic acid (SDA), Eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA) [2].

Fish and fish oil are rich sources of the long chain fatty acids such as (EPA) and (DHA), whereas the ALA, which serves as a precursor to the synthesis of long-chain PUFAs in the human body, is present in plant seeds and oil, green leafy vegetables, and nuts and beans. Linoleic acid is an omega-6 fatty acid present in grains, meats, and seeds of most plants [3].

According to earlier research and epidemiological studies, a consuming diet rich in marine mammals and fish reduced the incidence of cardiovascular disease [4].

The omega-3 PUFAs impact health by altering blood lipid profiles and membrane lipid consumption and by influencing eicosanoid biosynthesis, cell signaling cascade, and gene expression [5]. Additional, studies revealed the beneficial effect of omega-3 PUFAs in cardiovascular diseases like, atrial fibrillation, atherosclerosis, thrombosis, and inflammation, and other health conditions and diseases like diabetes, cancer, depression, mental illnesses, cognitive decline, and rheumatoid arthritis [6–10]. Omega-3 fatty acids, particularly EPA and DHA, contribute to fetal brain retinal development [11].

Prescription omega-3 products are highly purified and required to meet strict FDA regulatory standards [12, 13].

These products are approved by the FDA to treat a disease and prescribed by a licensed professional [14].

Currently available omega-3 prescription products are omega-3 ethyl ester (Lovaza) which contains both DHA and EPA and icosapent ethyl (Vascepa) which contains high-purity EPA [12].

Omega-3 ethyl ester has clinically proven efficacy and safety and is indicated as an adjunct to dietary intervention to reduce triglyceride in adults with triglyceride levels ≥ 500 mg/dl. Icosapent Ethyl is approved for patients with hypertriglyceridemia with triglyceride ≥ 500 mg/dl or to reduce cardiovascular events for patients with triglyceride ≥ 150 mg/dl as an adjunct to maximally tolerated statin [14]. DHA and EPA-containing prescription products should not be substituted for Icosapent Ethyl, because DHA may raise LDL-C and/or blunt statin LDL-C-lowering effect [15].

Dietary supplements are products ingested to add more nutritional value and/or supplement the diet including vitamins,

minerals, probiotics, fish oils, herbs/botanicals, enzymes, amino acids, and protein powders [16, 17]. Most dietary supplement fish oil products contain a combination of DHA and EPA [12].

Omega-3 dietary supplements should not be substituted for prescription omega-3 products to treat diseases [15]. Dietary supplements fish oils reported several issues like variable content of EPA and/or DHA, inconsistency with labeled quantities, poor product quality and impurity in addition to unwanted levels of saturated fats and oxidation products of more than safety limits [18].

MATERIALS AND METHODS

A cross-sectional questionnaire-based study was conducted to assess the knowledge, attitude, and practice among pharmacists regarding prescription and dietary supplements of omega-3 medications. Ninety-three filled questionnaires were received from six private pharmacies in Kirkuk City from June to December 2022. The study population consisted of individuals attending community pharmacies asking for omega-3 products either by prescription or as self-medicated drugs.

The questionnaire included close-and open-ended questions including questions on sociodemographic characteristics (name, age, and gender), the forms of omega-3 products available in each pharmacy, the type of the product purchased by the customer, consuming the product according to a prescription, an over the counter (OTC) or as a dietary supplement. Additionally, the questionnaire included questions about the reason for purchasing the prescription products or the dietary supplement as an OTC without a medical prescription. The closing sections included questions about past medical and drug-taking history (Table1).

RESULTS

• Sociodemographic characteristics

Over 6 months, 43 patients from 93 (46.2%) were dispensed fish oil supplementations by prescription, and 50 patients 93 (53.7%) were dispensed fish oil preparation without prescription. The nonprescription users were younger (32.92 vs. 44.41 years old) and more often female (63% vs. 58%) compared to prescription users with a range age of self-dispensed users (14–75) compared to a range of age of prescription users of (6–70) (Table 2).

Table 1. Dietary supplement and prescription omega-3 fatty acid products usage in Kirkuk city: A consumer questionnaire .

Name :	Age in a year:	Gender:	
The forms of omega 3 available in pharmacies in Kirkuk city, Iraq	Fish oil	EPA:	DHA:
	Omega 3 EPA+DHA:	EPA:	DHA:
	Omega 3 EPA DHA:		
	Omega 3,6,9 Components:		
Is the product purchased with a prescription or over the counter?	Prescription:		The dose:
	If prescription, specify the type:		
	Over the counter (OTC)		The dose:
Prescription	If over the counter, specify the type:		The dose:
	If as an antihyperlipidemic:		
	Use of statins:		
	Yes:	No:	
	Does the customer know his TG level?		
	Yes:	No:	
	If yes: TG level is:		
Does the customer know his LDL-C level?			
Yes:	No:		
If yes: LDL-C level :			
Why is the patient purchasing over-the-counter products?			
Past medical disease	Prior hypertension:		
	Prior stroke:		
	Prior diabetes		
	Prior Heart Failure:		
	Prior Coronary vascular disease: Unknown:		
Drug history	Warfarin:		
	Heparin or low-molecular-weight heparin:		
	aspirin:		
	Clopidogrel or Other antiplatelet drugs:		
	Unknown:		

EPA : Eicosapentaenoic acid , DHA : Docosahexaenoic acid , TG : Triglyceride , LDL-C : Low-density lipoprotein cholesterol

Table 2. Sociodemographic characteristics of respondents .

Characteristic	OTC (n =50)	Prescription (n =43)
Age at first dispensation		
Mean (years)	32.9	42.4
Median (years)	28	46
1-15	2.1%	11.6%
16-30	48.2%	13.9%
31-45	20.5%	20.9%
46-60	16.1%	37.2%
61-75	12.9%	16.2%
> 75	0.1%	
Sex		
Female	71.4%	64%
Male	28.6%	36%

etary supplement, 3.57% eye health, 3.57 anti-inflammatory and 3.57% Hypertension (Table 3).

The most commonly used omega-3 products are Omega-3 1000mg (EPA and DHA) 44.4%, omega 3,6,7,9 (omega3: 260mg, omega6: 40mg, omega7: 100mg, omega9: 200mg) 19%, omega3 and vitamin E (omega3: 300mg, Vitamin E: 3mg) 14.2%, Fish oil (EPA 180mg, DHA 120mg) 11.1%, omega 3,7 (omega3: 300mg, omega7: 100mg) 7.9% and the least common used forms are omega 3 EPA+DHA+DPA (270) 1.5% and omega-3 syrup (125 mg DHA) 1.5% (Table 4).

• Commonly used prescription and nonprescription omega-3 products

Of the 93 patients included in the study, 14% used Over-the-counter Omega -3 preparation for hypertriglyceridemia, 44% used Omega 3 as a dietary supplement, 20% used it for hair loss, 0.08% used it for memory and 0.02 used it as a dietary supplement for pregnancy.

Among prescription users 35.7% prescribed omega3 for hypertriglyceridemia, 3.57% used it for attention-deficit hyperactivity disorder (ADHA),14.2% for pregnancy care, 3.57% for memory function, 21.4% for rheumatoid arthritis, 10.7 as di-

Table 3. Indications of taking Omega-3 products by prescription or as OTC.

Indications	OTC (n=50)	Prescription (n=43)
Hypertriglyceridemia	14%	35.7%
Dietary supplement	44%	10.7%
Hair loss	20%	N/A ^a
Pregnancy care	0.02%	14.2%
ADHA ^b	N/A	13.57%
Memory function	0.08%	3.57%
Rheumatoid arthritis	N/A	21.4%
Eye health	N/A	3.57%
Ant inflammatory	N/A	3.57%
Hypertension	N/A	3.57%

N/A : not available , ADHA : Attention-deficit hyperactivity disorder

Table 4. Most commonly used omega-3 products .

Omega-3 forms	percentage of use %	OTC%	prescription%
Omega-3 1000mg (EPA ^a and DHA ^b)	44.4%	15.8%	28.5%
omega 3,6,7,9	19%	17.4%	1.5%
omega3 and vitamin E	14.2%	6.3%	4.7%
Fish oil (EPA 180mg, DHA 120mg)	11.1%	12.6%	1.5%
omega 3,7	7.9%	1.5%	6.3%
omega 3 EPA+DHA+DPA ^c	1.5%	1.5%	
omega-3 syrup	1.5%	1.5%	

EPA : Eicosapentaenoic acid, DHA : docosahexaenoic acid, DPA : docosapentaenoic acid

DISCUSSION

This study provides the first detailed investigation of omega-3 products use in a nationally representative sample of the Iraqi population.

It was observed that all the products supplied to customers for various indications either by prescription or as an OTC are dietary supplements. This is because of the unavailability of prescription omega-3 products like (Lovaza and Vascepa) in Kirkuk pharmacies. Moreover, only a few healthcare providers knew about the differences between prescription and nonprescription omega-3 preparations.

Differences in healthcare systems and the role of community pharmacies cause comparing the results of this study with those of other studies conducted in other countries somewhat difficult. This study found that the use of omega-3 supplements, as OTC or by prescription, was more prevalent in females. This result is consistent with the results of another study [17].

In the OTC group, females mostly used these supplements as dietary supplements or as a treatment for hair loss. This result seems to be attributed to the effects of direct-to-consumer advertising which promotes the use of omega-3 supplements to correct nutritional deficiencies or for hair loss. This study indicated that 14.2% of women were prescribed omega-3 supplements as prenatal nutrients. According to previous studies, adequate omega-3 fatty acids, particularly, EPA and DHA, intake in pregnant women has a positive role in increasing

gestation length and birth weight and beneficial effects on neonatal cognitive and visual function, particularly in women who do not eat enough seafood [19–21]. Hypertriglyceridemia was the most common indication for prescribing omega-3 products for women, although the prescribed types were dietary supplements.

In the present study, the highest prevalence of omega-3 dietary supplement use was in those aged between 15–30 years, who purchase it from pharmacies without a prescription, and this seems logical as young individuals most likely seek dietary supplements to improve and maintain health.

Various types of omega-3 products are available, with some being over the counter and others being prescribed by physicians. About half of the study population used omega-3 1000mg (EPA+DHA). This high prevalence is largely due to the unavailability of prescription omega-3 products and the tendency of physicians to prescribe high doses of the available omega-3 products for the treatment of hypertriglyceridemia. Other common causes of prescribing omega-3 1000 mg (EPA+DHA) included maintaining vision, brain, and joint health. The second most commonly used product was omega 3–6–7–9 fatty acids. Omega 3&7 were mostly prescribed by gynecologists as prenatal nutrients. This study showed that children were prescribed Omega-3 fatty acids syrup for patients with attention-deficit hyperactivity disorder (ADHD). According to previous studies, omega-3 fatty acids showed positive effects in the treatment of clinical and cognitive symptoms in

children with ADHD [22].

CONCLUSION

Healthcare providers and consumers need to distinguish the differences between prescription omega-3 products and omega-3 dietary supplements. Pharmacists have an important role in clarifying the critical differences between prescription products and dietary supplements, while omega-3 dietary supplements have an important role in maintaining health, these products do not meet the FDA drug standards for safety, efficacy, and manufacturing and are not intended to treat serious medical diseases like hypertriglyceridemia.

ETHICAL DECLARATIONS

• Acknowledgements

None.

• Ethics Approval and Consent to Participate

This study was approved by the Local Kirkuk Health Directorate Ethical Approval Committee.

• Consent for Publication

Non.

• Availability of Data and Material

The datasets are available from the corresponding author upon reasonable request.

• Competing Interests

The authors declare that there is no conflict of interest.

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• Authors' Contributions

The author contributed significantly, directly, and intellectually to the work and consented it to be published.

REFERENCES

- [1] Karageorgou D, Rova U, Christakopoulos P, Katapodis P, Matsakas L, Patel A. Benefits of supplementation with microbial omega-3 fatty acids on human health and the current market scenario for fish-free omega-3 fatty acid. *Trends in Food Science & Technology* 2023;136(4):169–180. <https://doi.org/10.1016/j.tifs.2023.04.018>.
- [2] Shahidi F, Ambigaipalan P. Omega-3 polyunsaturated fatty acids and their health benefits. *Annual review of food science and technology* 2018;9(1):345–381. <https://doi.org/10.1146/annurev-food-111317-095850>.
- [3] Covington MB. Omega-3 fatty acids. *American family physician* 2004;70(1):133–140.
- [4] Shahidi F, Miraliakbari H. Marine oils: compositional characteristics and health effects. In: *Nutraceutical and Specialty Lipids and their Co-products* CRC Press; 2006.p. 241–264.
- [5] Shahidi F, Ambigaipalan P. Beverages fortified with omega-3 fatty acids, dietary fiber, minerals, and vitamins. *Handbook of Functional Beverages and Human Health* 2016;p. 801–813.
- [6] Alexander DD, Miller PE, Van Elswyk ME, Kuratko CN, Bylsma LC. A meta-analysis of randomized controlled trials and prospective cohort studies of eicosapentaenoic and docosahexaenoic long-chain omega-3 fatty acids and coronary heart disease risk. In: *Mayo Clinic Proceedings*, vol. 92 Elsevier; 2017. p. 15–29. <https://doi.org/10.1016/j.mayocp.2016.10.018>.
- [7] Xiao Y, Zhang Q, Liao X, Elbelt U, Weylandt KH. The effects of omega-3 fatty acids in type 2 diabetes: A systematic review and meta-analysis. *Prostaglandins, Leukotrienes and Essential Fatty Acids* 2022;182:102456. <https://doi.org/10.1016/j.plefa.2022.102456>.
- [8] Volpato M, Hull MA. Omega-3 polyunsaturated fatty acids as adjuvant therapy of colorectal cancer. *Cancer and Metastasis Reviews* 2018;37:545–555. <https://doi.org/10.1007/s10555-018-9744-y>.
- [9] Lange KW. Omega-3 fatty acids and mental health. *Global Health Journal* 2020;4(1):18–30. <https://doi.org/10.1016/j.glohj.2020.01.004>.
- [10] Cashman KD. Diet, nutrition, and bone health. *The Journal of nutrition* 2007;137(11):2507S–2512S. <https://doi.org/10.1093/jn/137.11.2507S>.
- [11] Calder PC. Omega-3 polyunsaturated fatty acids and inflammatory processes: nutrition or pharmacology? *British journal of clinical pharmacol-*

- ogy 2013;75(3):645–662. <https://doi.org/10.1111/j.1365-2125.2012.04374.x>.
- [12] Bedminster, NJ. Vascepa [package insert]. Amarin Pharma Inc. 2019;
- [13] Mason RP, Sherratt SC. Omega-3 fatty acid fish oil dietary supplements contain saturated fats and oxidized lipids that may interfere with their intended biological benefits. *Biochemical and biophysical research communications* 2017;483(1):425–429. <https://doi.org/10.1016/j.bbrc.2016.12.127>.
- [14] Ito MK. A comparative overview of prescription omega-3 fatty acid products. *Pharmacy and Therapeutics* 2015;40(12):826.
- [15] Hilleman D, Smer A. Prescription Omega-3 Fatty Acid Products and Dietary Supplements Are Not Interchangeable. *Managed care (Langhorne, Pa)* 2016;25(1):46–52.
- [16] Food U, Administration D, et al., Regulatory information: dietary supplement health and education act of 1994; 2015.
- [17] Cohen PA. Hazards of hindsight—monitoring the safety of nutritional supplements. *New England journal of medicine* 2014;370(14):1277–1280. <https://doi.org/10.1056/NEJMp1315559>.
- [18] Hilleman DE, Wiggins BS, Bottorff MB. Critical differences between dietary supplement and prescription omega-3 fatty acids: a narrative review. *Advances in Therapy* 2020;37:656–670. <https://doi.org/10.1007/s12325-019-01211-1>.
- [19] O'Brien SK, Malacova E, Sherriff JL, Black LJ. The prevalence and predictors of dietary supplement use in the Australian population. *Nutrients* 2017;9(10):1154. <https://doi.org/10.3390/nu9101154>.
- [20] De Giuseppe R, Roggi C, Cena H. n-3 LC-PUFA supplementation: effects on infant and maternal outcomes. *European journal of nutrition* 2014;53:1147–1154. <http://dx.doi.org/10.1007/s00394-014-0660-9>.
- [21] Jordan RG. Prenatal omega-3 fatty acids: review and recommendations. *Journal of midwifery & women's health* 2010;55(6):520–528. <https://doi.org/10.1016/j.jmwh.2010.02.018>.
- [22] Chang JPC. Personalised medicine in child and Adolescent Psychiatry: Focus on omega-3 polyunsaturated fatty acids and ADHD. *Brain, Behavior, & Immunity-Health* 2021;16:100310. <https://doi.org/10.1016/j.bbih.2021.100310>.