Articles

Growth of the Omega 3 industry applied in non-surgical periodontal therapies in dental practitioners

Crecimiento de la industria del Omega 3 aplicado en terapias periodontales no quirurgicas en profesionales de odontología

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ABSTRACT

The aim of this systematic review is to recognise the effects of dietary supplementation of Omega 3 (fatty acids) as an adjuvant in non-surgical periodontal therapy in patients with periodontitis. In the present research work, a Systematic Review of Randomised Clinical Trials on the supplementary use of Omega 3 in the diet of patients with periodontitis was carried out. The guidelines of the CONSORT 2010 statement were followed using different search equations and previously selected articles. The results show the synthesis of 12 articles selected for this study, providing information such as author, year, journal and quartile classification, among other parameters such as blood biomarkers present and periodontal clinical parameters. In conclusion, the analysis of the efficacy of Omega-3 as an adjunct to non-surgical periodontal therapy (NSPT) shows that, although improvements in clinical indicators such as calculus index (CIN), periodontal pocket depth and bleeding on probing are observed, the additional

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impact of Omega-3 has not been shown to be statistically significant. The variability in results may be due to differences in study designs, doses administered, and sample sizes, which limits the ability to establish a clear benefit of Omega-3 on these specific parameters.
Keywords: Omega-3, adjuvant, periodontal therapy, non-surgical, review.

RESUMEN

El objetivo de esta revisión sistemática es reconocer los efectos de la suplementación dietética de Omega 3 (ácidos grasos) como coadyuvante en la terapia periodontal no quirúrgica aplicada a pacientes con periodontitis. En el presente trabajo de investigación se realizó una Revisión Sistemática de Ensayos Clínicos Aleatorizados sobre el uso suplementario de Omega 3 en la dieta de pacientes con periodontitis. Para su elaboración, se sigue las directrices de la declaración CONSORT 2010 mediante diferentes ecuaciones de búsqueda y los artículos previamente seleccionados. Los resultados dan cuenta de la síntesis de 12 artículos seleccionados para este estudio, dando a conocer la información como autor, año, revista y clasificación de cuartil, entre otros parámetros como biomarcadores sanguíneos presentes y los parámetros clínicos periodontales. En conclusión, el análisis de la eficacia del Omega-3 como complemento en la terapia periodontal no quirúrgica (TPNQ) muestra que, aunque se observan mejoras en los indicadores clínicos como el índice de cálculo (NIC), la profundidad de la bolsa periodontal y el sangrado al sondaje, el impacto adicional del Omega-3 no ha demostrado ser estadísticamente significativo. La variabilidad en los resultados puede deberse a diferencias en los diseños de estudio, dosis administradas, y tamaños muestrales, lo que limita la capacidad para establecer un beneficio claro del Omega-3 en estos parámetros específicos.
Palabras clave: Omega 3, coadyuvante, terapia periodontal, no quirúrgica, revisión

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INTRODUCTION

The oral cavity is home to at least 700 species, which is why it is vulnerable to any type of affectation. Diseases of the oral cavity reach approximately 3.5 billion people. Among the presentations of this pathology is periodontitis, which affects the bone-supporting tissues, causing tooth mobility and tooth loss, with a prevalence of up to 80% in adults. This is caused by poor dental hygiene not removed by an efficient mechanical brushing, thus inducing the loss of insertion, tooth mobility, leading to a total loss of the dental organ. According to the WHO (World Health Organisation), periodontal disease is no longer just an oral problem, it has become a problem of public health concern. Nowadays, periodontal disease, recognised as an inflammatory disease of the gums and supporting tissues affecting the bone, cementum and periodontal ligament, is considered the second most prevalent oral disease in the world after dental caries. Considering the progress of this disease, it has become a generalised problem and not only an oral health problem. It is characterised by inflammation of the gingival tissue, affecting the supporting bone, and there are two forms of periodontal disease known as gingivitis, evolving into periodontitis. Throughout research, different adjuvants have been sought in the reduction of this inflammatory process combined with non-surgical periodontal treatment in search of better therapeutic advances. The WHO reports that up to 15% of the world's population is affected by periodontal disease, which is considered the sixth most common disease.

For several decades the treatment of periodontal disease has been non-surgical, consisting of subgingival instrumentation to remove calcified plaque deposits. Currently, there is the use of new therapies such as host modulation, by means of which a complement to periodontal therapy is provided, with the objective of reducing the progressive destruction that characterises this disease and the subsequent stabilisation of the periodontium through the modification of the immune agents that are responsible for the protective response, and in the same way produce the reduction of the factors causing the damage. Among the drugs used is Omega 3 or mostly known as unsaturated fatty acids, with multiple protective benefits, they are also considered essential for our body, but must be acquired through a dietary supplementation as our body alone is not able to synthesize it.

The most representative of this group are ALA (linoleic acid), EPHA, DPHA, which are associated with the daily consumption of foods such as fish oils, salmon, different types of seafood. Their dietary consumption has been associated with different benefits during pregnancy, such as preventing premature birth, helping with adequate birth weight, and there are even studies that guarantee that supplementation with Omega 3 during the gestational stage helps at a cardiovascular level, which is why the FDA recommends not exceeding 3mg/day of consumption to prevent adverse effects; however, no inconvenience has been found in the administration of doses higher than these.

Another of the important benefits of Omega 3 is its anti-inflammatory properties, due to the production of molecules such as protecins, marecins and resolvins, which can help

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to reduce the production of inflammatory molecules such as prostaglandins and leukotrienes, as well as regulating the activity of immune cells such as macrophages, It has even been shown in studies to prevent the degradation of bone tissue around the tooth by inhibiting the action of enzymes such as metalloproteinases that degrade bone tissue, recognising the beneficial capacity of fatty acid supplementation in periodontal disease.

For this reason, the aim of this systematic review is to recognise the effects of dietary supplementation of Omega 3 (fatty acids) as an adjuvant in non-surgical periodontal therapy applied to patients with periodontitis.

MATERIALS AND METHODS

In the present research work, a Systematic Review of Randomised Clinical Trials on the supplementary use of Omega 3 in the diet of patients with periodontitis was carried out. The guidelines of the CONSORT 2010 statement were followed using different search equations and previously selected articles. For this review the selection of studies was based on a PICOS question which will be shown attached.

In order to structure the research question, and to be able to identify the keywords we categorised in the MESH and DECS. The PICOS (Population, Intervention, Control, Outcome) strategy was used to identify the research question, which subsequently helped to synthesise the articles included in this study (Table 1).

Table 1: *PICOS*

Idea	Uso del Omega 3 como coadyuvante en la terapia periodontal no quirúrgica				
Pregunta clínica	¿Cuál es el efecto de la suplementación dietética con Omega 3 en el tratamiento periodontal no quirúrgico en pacientes con periodontitis?				
Picos	Población	Intervención	Comparación	Resultados	Estudios
	Pacientes con periodontitis.	TPNQ	Omega 3	Índice de placa Sangrado al sondaje Nivel de inserción clínica Profundidad de bolsa	ECAS
MESH	Periodontitis disease Periodontitis	Non-surgical	Omega-3 Fatty acids	Plate index Bleeding on probing	Randomized clinical trial

		periodontal therapy Scraping and root planning		Clinical insertion level	
DECS	Enfermedad periodontal	Terapia periodontal no quirúrgica Raspado y alisado radicular	Omega-3 Ácidos grasos	Índice de placa Sangrado al sondaje Nivel de inserción clínica	Ensayos clínicos aleatorizados
Inglés	Adult periodontitis OR Periodontal disease) AND Periodontal Pocket OR Periodontitis AND (Periodontal inflammation OR Periodontal therapy) AND omega 3. (Scaling and root planning OR SRP) AND NON-surgical periodontal therapy OR Periodontal treatment AND (fatty acids OR omega-3 OR docosahexaenoic acids)				
Español	Periodontitis del adulto O Enfermedad periodontal) Y Bolsa periodontal O Periodontitis Y (Inflamación periodontal O Terapia periodontal) Y omega 3. (Raspado y alisado radicular O SRP) Y terapia periodontal NO quirúrgica O Tratamiento periodontal Y (ácidos grasos O omega-3 O ácidos docosahexaenoicos)				

Source: Own elaboration. Source of information and search strategy

An electronic bibliographic search was carried out in Scopus, Web of science, Pubmed, Cochrane and Taylor & Francis; a manual search was also carried out in important periodontology journals such as the Journal of Implantology and Oral Rehabilitation (PIRO), Periodontology 2000, Clinical periodotology and Journal of periodontology for articles published from 2000 to 2023.
The search was conducted independently using 25 keywords: 1) Adult periodontitis, 2) Periodontal disease, 3)Periodontitis, 4)Periodontal Pocket, 5) Periodontal inflamattion, 6) Periodontal therapy, 7) Scaling and root planning, 8) SRP, 9) NON surgical periodontal therapy, 10) Periodontal treatment, 11) fatty acids, 12) omega-3 (ω-3), 13) docosahexaenoic acids, 14) eicosapentaenoic acids, 15) fish oils, 16)DHA, 17) EPA, 18) polyunsaturated fatty acids, 19)bleeding on probing, 20) Control of inflammation, 21)

probing pocket depth, 22) plaque, 23) alveolar bone loss, 24) interleukin-1, 25) clinical attachment loss. These were applied to an electronic search engine using different joint search equations and bilean operators such as AND, OR, NOT, which were used to find articles included in this systematic review and 18 combinations were used for this purpose (Table 2):

Table 2. *Search equations*

(Adult periodontitis OR Periodontal disease) AND Periodontal Pocket OR Periodontitis AND (Periodontal inflammation OR Periodontal therapy) AND omega 3.
Scaling and root planning OR SRP) AND NON-surgical periodontal therapy OR Periodontal treatment AND (fatty acids OR omega-3 OR docosahexaenoic acids)
Polyunsaturated fatty acids AND (bleeding on probing OR Control of inflammation)
(Periodontitis OR Periodontal inflammation) AND fish oils
(Periodontal therapy OR NON-surgical periodontal therapy) AND bleeding on probing AND omega-3 (ω-3)
Periodontal Pocket AND (fatty acids OR fish oils)
Periodontal treatment AND Omega 3 AND (probing pocket depth OR Control of inflammation)
Periodontitis AND (Scaling and root planning OR bleeding on probing) AND polyunsaturated fatty acids
(Adult periodontitis OR Periodontal disease) AND (Scaling and root planning OR SRP) AND (fish oils OR omega-3)
Periodontitis AND (Periodontal therapy OR NON-surgical periodontal therapy) AND (plaque OR alveolar bone loss) AND fish oils
(Periodontal treatment OR Control of inflammation) AND (fatty acids OR polyunsaturated fatty acids) AND bleeding on probing
(Periodontal Pocket OR probing pocket depth) AND (omega-3 OR fish oils OR EPA) AND Control of inflammation
(fatty acids OR DHA OR EPA) AND (Periodontitis OR Periodontal inflammation) AND alveolar bone loss
Adult periodontitis AND (Scaling and root planning OR Periodontal therapy) AND (fatty acids OR fish oils)
Periodontitis AND (fatty acids OR omega-3 OR docosahexaenoic acids) AND (bleeding on probing OR alveolar bone loss)
(Periodontal disease OR Periodontal inflammation) AND (fish oils OR EPA OR polyunsaturated fatty acids) AND plaque
(Scaling and root planning OR SRP) AND (omega-3 OR fish oils) AND Control of inflammation

(fatty acids OR polyunsaturated fatty acids) AND (Periodontal treatment OR NON-surgical periodontal therapy) AND (bleeding on probing)

Fuente: Elaboración propia

Principle of the form
Inclusion and exclusion criteria
In order to define the inclusion criteria, the different parameters for the conduct of this systematic review were applied:

Inclusion criteria:
- Randomised Clinical Trials
- Controlled Clinical Trials
- Cases and Controls
- Patients over the age of
- Undergoing non-surgical periodontal treatment.
- Follow-up for more than one month.
- Evaluate periodontal clinical parameters.
- Patients with diagnosed periodontitis.
- All languages.

Exclusion criteria:
- Literature review articles.
- Patients with gingivitis.
- Experimental animal studies.
- Follow-up of less than one month.
- Articles that do not pertain to the subject.
- ECAS with less than 20 study subjects.

In order to assess the quality and risk of the different articles used in this study, the CONSORT 2010 (Consolidated Standards of Reporting Trials) statement was applied, which consists of 25 parameters to be assessed, which are subsequently classified into three categories, as shown below:

1 a 8	Ítems Validos Sesgo Alto
8 a 16	Ítems Validos Sesgo Medio
17 a 25	Ítems Validos Sesgo Bajo

The information from the different studies was extracted independently by the authors of the research. Based on the PICO question: What is the effect of dietary supplementation with Omega 3 on non-surgical periodontal treatment in patients with periodontitis? And data such as author, year of publication, age, sex, diagnosis, study

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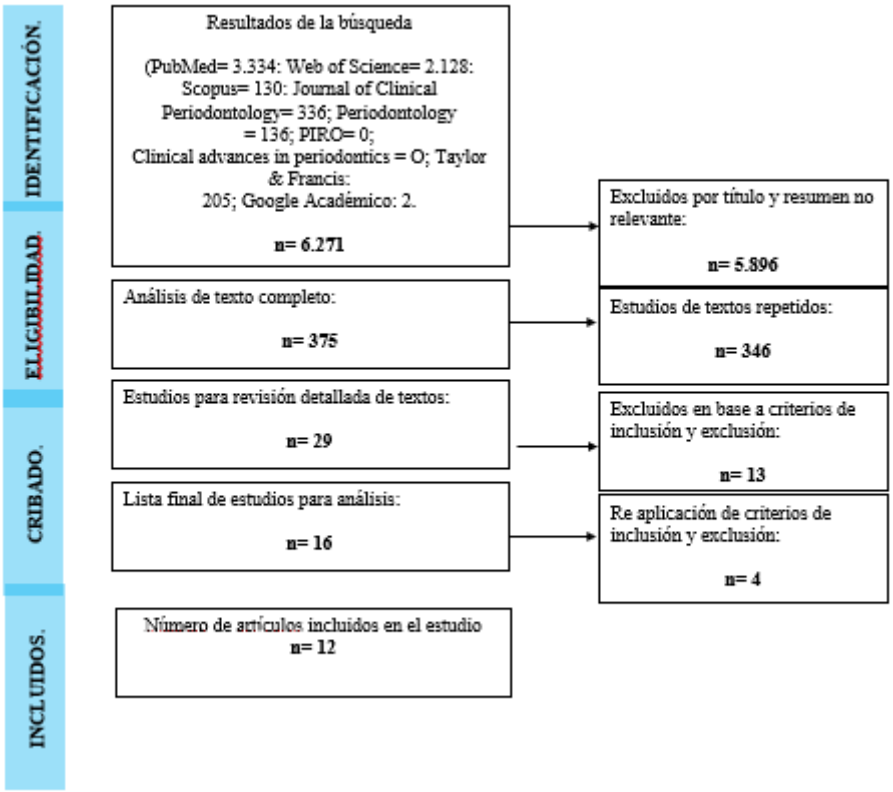
design, number of subjects, type of treatment received, age were extracted in an appropriate and careful manner.

RESULTS

In the total search of the articles, a total of 6271 articles were synthesised between the application of the electronic and manual search equation carried out in the different databases published up to December 2023. After a comprehensive reading of the titles and the application of the appropriate filters, a total of 5896 articles were obtained. After reading the abstracts of each of the articles with a final total of 375, taking into account the exclusion of duplicate articles, abstracts not pertaining to the subject, articles not relevant, a total of 29 articles were obtained, of which by applying the inclusion and exclusion criteria detailed above in the article, 12 qualified randomised clinical trials were obtained, which are within this study for analysis of their quality (figure 1). According to the CONSORT 2010 statement all twelve articles meet the relevant criteria to be qualified as low bias studies, i.e. with 100% of the papers included in this study having a low quality and low bias (figure 2,3). (figure 2,3)

Figure 1. Flowchart Article selection



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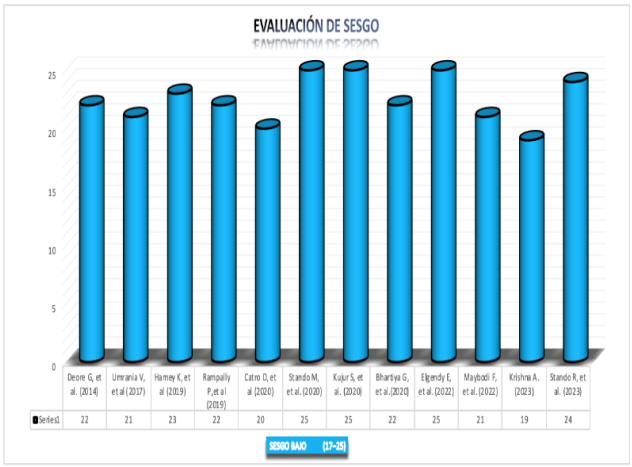
Source. Own elaboration

Risk Assessment (CONSORT 2010)
Figures 2 and 3 show the quality of the studies included in this research work, which specifically shows an assessment of bias with a low percentage in relation to the application of the CONSORT 2010 parameters.

Figure 2. Bias - CONSORT

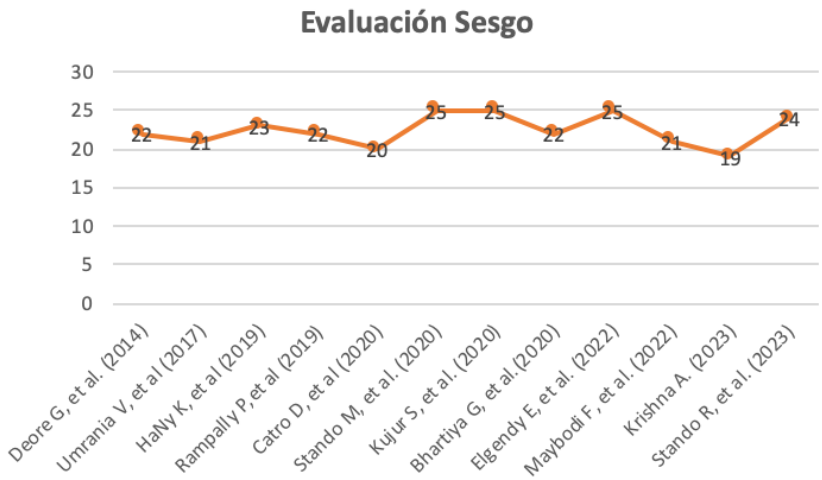
Deore G, et al. (2014)	22	SESGO BAJO	(17–25)
Umrania V, et al (2017)	21	SESGO BAJO	(17–25)
Hamey K, et al (2019)	23	SESGO BAJO	(17–25)
Rampally P,et al (2019)	22	SESGO BAJO	(17–25)
Catro D, et al (2020)	20	SESGO BAJO	(17–25)
Stando M, et al. (2020)	25	SESGO BAJO	(17–25)
Kujur S, et al. (2020)	25	SESGO BAJO	(17–25)
Bhartiya G, et al.(2020)	22	SESGO BAJO	(17–25)
Elgendy E, et al. (2022)	25	SESGO BAJO	(17–25)
Maybodi F, et al. (2022)	21	SESGO BAJO	(17–25)
Krishna A. (2023)	19	SESGO BAJO	(17–25)
Stando R, et al. (2023)	24	SESGO BAJO	(17–25)

1	8	SESGO ALTO	(1–8)
9	16	SESGO MEDIO	(9–16)
17	25	SESGO BAJO	(17–25)



Source. Own elaboration

Figure 3. Bias - CONSORT in line graph.



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Risk of bias in studies assessed at the study level using the Rob Tool (Figure 4).

Figure 4. Cochrane Rob Tool.

Fuente. Elaboración propia

Table 3 shows in detail the 12 articles selected for this study, providing information such as author, year, journal and quartile classification, among other parameters such as blood biomarkers present and periodontal clinical parameters (CAL, PI, GI, PB).

Table 3. *Characteristics of the selected studies*

Autores	Año	Revista	Cuartiles	Número	Edad	Sexo	Parámetros periodontales	Biomarcadores
Deore G, et al.	(2014)	Journal Periodontal Implant Sci	Q3	70	30 y 60 años	Masculino Femenino	CAL PI GI PB	Interleucina 1 PCR
Umrania V, et al	2017)	J Indian Soc Periodontoly.	Q3	40	35 a 44	Masculino	CAL PI GI PB	Interleucina 1 PCR

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					años			
Hamy K, et al	(2019)	Cochrane	Q1	45	35-55 años	Masculino Femenino	CAL PI GI PB	Interleucina 1 Hemoglobina Glicosilada
Rampally P,et al	(2019)	J Indian Soc Periodontoly.	Q3	42	30–65 años	Masculino Femenino	CAL PI GI PB	
Castro D, et al	(2020)	Journal of Periodonto ly	Q1	75	35 años	Masculino Femenino	R CAL PI GI PB	
Stando M, et al.	(2020)	Nutrients	Q1	40	22 y 70 años	Masculino Femenino	CAL PI GI PB	Hemoglobina Glicosilada
Kujur S, et al.	(2020)	Indian Journal of Dental Research	Q3	90	30 a 70 año	Masculino Femenino	CAL PI GI PB	
Bhartiya G, et al.	(2020)	Journal of Oral Research and Review	Q1	45	18 a 65 años	Masculino Femenino	CAL PI GI PB	
Elgendy E, et al.	(2022)	Oral Health Prev Dent	Q2	50	45 años a 60	Femenino	CAL PI GI PB	

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					años			
Maybodi F, et al.	(2022)	BMC Oral Health	Q1	30	30 a 70 años	Masculino Femenino	RAR	(P = 0,001)
Krishna A.	(2023)	Clinical Trial Gov	Q1	46	18 a 60 años	Masculino Femenino	RAR	P >0,05
Standro R, et al.	(2023)	BMC Oral Health	Q1	40	22 y 70 año	Masculino Femenino	RAR	0,05.

The general characteristics of each study and the quality of the studies included in the systematic review of the literature are presented below (Table 4).

Table 4. *General characteristics and quality of selected studies*

							Análisis de Calidad		
Autores año	Diseño del estudio	Número	Grupo de Estudio	Tratamiento aplicado	Valor p	Prueba estadística aplicada	Criterios cumplidos	Porcentaje	Escala
Deore G, et al. (2014)	Ensayo clínico aleatorizado	70	Periodontitis crónica moderada y grave	RAR	P > 0,05	CHI CUADRADO	22/25	88%	CONSORT
Umrania V, et al	Ensayo clínico	40	periodontitis crónica grave	RAR	P = 0,001	prueba T y el análisis de	21/25	84%	CONSORT

(2017)	aleatorizado					varianza de medidas repetidas			
Hamy K, et al (2019)	Ensayo clínico aleatorizado	45	periodontitis en estadio II o III y grado B.	RAR	P≤0,01	CHI CUADRADO	23/25	92%	CONSORT
Rampally P,et al (2019)	Ensayo clínico aleatorizado	42	diabetes tipo II y periodontitis crónica.	RAR	P < 0,05	prueba t pareada para datos continuos y la prueba de rangos con signos de Wilcoxon para datos de puntuación.	22/25	88%	CONSORT
Castro D, et al (2020)	Ensayo clínico aleatorizado	75	pacientes con diabetes tipo 2 y periodontitis crónica generalizada de moderada a grave	RAR	P > 0,05	CHI CUADRADO	20/25	80%	CONSORT

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Stando M, et al. (2020)	Ensayo clínico aleatorizado	40	periodontitis generalizada en estadio III y IV	RAR	P > 0,05	CHI CUADRADO	25/25	100%	CONSORT
Kujur S, et al. (2020)	Ensayo clínico aleatorizado	90	periodontitis crónica no tratad	RAR	0,05.	studentt-prueba	25/25	100%	CONSORT
Bhartiya G, et al.(2020)	Ensayo clínico aleatorizado	45	Pacientes con periodontitis crónica generalizada (profundidad de sondaje ≥5 mm)	RAR	P < 0,001	CHI CUADRADO	22/25	100%	CONSORT
Elgendy E, et al. (2022)	Ensayo clínico aleatorizado	50	mujeres posmenopáusicas con periodontitis crónica	RAR	0,05.	studentt-prueba	25/25	100%	CONSORT
Maybodi F, et al. (2022)	Ensayo clínico aleatorizado	30	Periodontitis	RAR	(P = 0,001)	prueba T	21/25	84%	CONSORT

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Krishna A. (2023)	Ensayo clínico aleatorizado	46	Periodontitis crónica	RAR	P > 0,05	CHI CUADRADO	19/25	76%	CONSORT
Stando R, et al. (2023)	Ensayo clínico aleatorizado	40	periodontitis no tratada en estadios III y IV.	RAR	0,05.	studentt-prueba	24/25	96%	CONSORT

Table 5 clearly summarises the different studies, the methodology included within each study, the follow-up period together with the omega dose applied and the results observed during that time.

Table 5. *ECAS relationship between periodontitis and Omega 3*

Titulo	Objetivo	Metodología	Dosis diaria	Duración	Resultados
Omega 3 fatty acids as a host modulator in chronic periodontitis patients: a randomised, double-blind, placebo-controlled, clinical trial	Evaluar la suplantación dietética de omega 3 como agente modulador de la periodontitis crónica.	En el estudio se incluyeron 60 sujetos portadores de periodontitis.	300mg/dosis al día repartidas entre 120mg de DHA y 180 de EPHA	3 meses	Se obtuvo una reducción del sangrado al sondeo, de la profundidad de la bolsa periodontal además de una ganancia en el NIC en el grupo de tratamiento.
Evaluation of dietary supplementation of omega-3 polyunsaturated fatty	El objetivo fue evaluar	Se incluyeron en este estudio 40	700mg/ día dosis	3 meses	Reducción en el índice del sangrado

acids as an adjunct to scaling and root planning on salivary interleukin-1β levels in patients with chronic periodontitis: A clinico-immunological study	los parámetros clínicos periodontales y salivales de la suplementación con o sin consumo de omega 3.	participantes con periodontitis, divididos en 20 personas cada grupo.			gingival, CAL, y profundidad de las bolsas mostraron diferencias significativas.
Comparison of effectiveness of low-dose aspirin versus omega-3 fatty acids as adjuvants to nonsurgical periodontal therapy in Type II diabetic patients with chronic periodontitis	Evaluar la eficacia del suplemento de omega 3 en el tratamiento periodontal no quirúrgico.	Cuarenta y dos pacientes hasta los 65 años con diagnóstico de periodontitis crónica.	500mg/ día dosis	Dos veces al día durante 3 meses	Hubo reducción en la bolsa periodontal, Cal, y en parámetros como la hemoglobina glicosilada, en comparación a la aspirina demostraron ser mejores.
Omega-3 PUFA and Aspirin as Adjuncts to Periodontal Debridement in Patients with Periodontitis and Type 2 Diabetes Mellitus. Randomized Clinical Trial	El objetivo de este estudio fue evaluar la eficacia de la aspirina en dosis	Setenta y cinco pacientes para observar el resultado clínico en pacientes con	3 g de aceite de pescado/día + 100 mg de ASA/día	Dos meses	Existió una ganancia de inserción clínica además de FIN-γ e IL-8 disminuyo en el rango

	baja frente al consumo de omega 3 en la terapia periodontal no quirúrgica.	diabetes tipo II			de tiempo del estudio.
Comparative clinical evaluation of supplementation with omega-3 fatty acids, given for different time period, in chronic periodontitis patients	El objetivo se centró en comparar la eficacia de la administración vía oral de la aspirina a comparación de la omega 3 en pacientes con periodontitis crónica diagnosticados con diabetes.	Cuarenta y cinco pacientes con periodontitis crónica.	300mg/día	En tres periodos de tiempo hasta los 3 meses	Se determinó que la administración es eficaz para la reducción de PI, GI Y CAL.
Evaluation of adjunctive effect of daily dietary supplements with omega 3 and propolis	Evaluar la eficacia del consume dietético	Pacientes divididos en tres grupos de comparació	3 gramos	6 meses	Reducción significativa de la inflamación, de la

to non-surgical periodontal therapy: Randomized Clinical Trial	de omega 3.	n, al que a uno de ellos se les suministro omega 3			profundidad de la bolsa, CAL.
Effects of omega-3 supplementation as an adjunct to non-surgical periodontal therapy on periodontal parameters in periodontitis patients: a randomized clinical trial	Evaluar los resultados clínicos de cada uno de los parámetros clínicos periodontales frente al consumo de omega 3.	Se dividieron dos grupos de pacientes de 15 personas cada una portadora de periodontitis	Intervención: 1000mg de omega tres 300mg omega 3 120mg DPHA 180 EPHA. Control: Aceite soja	3 meses	Existió mejoría en el grupo de control en los parámetros de CAL, PD entre otros en mayor prevalencia a comparación del consumo de soja.
Omega-3 Polyunsaturated Fatty Acids EPA and DHA as an Adjunct to Non-Surgical Treatment of Periodontitis: A Randomized Clinical Trial	Evaluar el efecto de la suplementación dietética con omega 3 en pacientes diagnosticados con periodontitis estadios 3 y 4.	Treinta individuos sanos con periodontitis en etapas III y IV participaron en la investigación y fueron tratados con raspado y alisado radicular (SRP).	2,6 g de EPA y 1,8 g de DHA	3 meses	Disminución notable en los niveles de citocinas/quimiocinas proinflamatorias, como la interleucina (IL)-8 e IL-17, mientras que los niveles de IL-10 antiinflamatoria aumentaron

					significativamente en las muestras de saliva de los pacientes que recibieron suplementos de omega-3
Clinical and microbiological outcomes of subgingival instrumentation supplemented with high-dose omega-3 polyunsaturated fatty acids in periodontal treatment - a randomized clinical trial	El objetivo fue observar los cambios clínicos periodontales en mujeres posmenopáusicas con y sin complemento dietético de omega 3.	Cuarenta pacientes divididos en dos grupos entre los cuales se aplicó un grupo de prueba y un grupo de control.	3000mg/día	3, 6 meses	En relación a las bolsas periodontales más profundas más de 6mm, en pacientes con periodontitis mayormente en dientes unirradiculares, lapso de tiempo de 3 meses
Efficacy of omega 3 fatty acid as an adjunct in the management of chronic periodontitis: A randomized controlled trial	El objetivo se centró en la evaluación del consumo dietético de omega 3 en pacientes con	Se incluyeron en este estudio 90 pacientes, para realizar terapia periodontal no quirúrgica.	500 mg (EPA/DHA 180/120 mg),	1 mes, 3 meses	Existió una ganancia del nivel de inserción clínica, con reducción de la bolsa de profundidad y sondeo almés y a los tres meses

	periodontitis.				de comparación.
A study to assess the levels of interleukin-1? In saliva after dietary supplementation of omega-3 poly unsaturated fatty acid (pufa) in patients with chronic periodontitis after scaling and root planing – a randomized control trial	El objetivo fue evaluar la eficacia de la omega 3 después del procedimiento de raspado y alisado radicular.	Incluyeron 46 pacientes portadores de periodontitis crónica entre los 18 a 60 años.	1.8 g de Omega-3 /día	3 meses	Hubo una reducción de la inflamación gingival y los diferentes parámetros clínicos como bolsas periodontales de hasta 4mm y la ganancia del nivel de insercion.
Efecto del Omega 3 sobre la Periodontitis en Mujeres Postmenopáusicas	Evaluar los resultados clínicos y microbiológicos del consumo de EPA y DHA en pacientes con periodontitis no tratada en	Se incluyeron dos grupos de mujeres postmenopáusicas para este estudio.	2000mg de omega 3	3, 6 meses	Existe una reducción significativa del nivel de inserción e inflamación al implementar estos complementos en la dieta de las mujeres de estudio.

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	estadiós III y IV.

Fuente: Elaboración Propia.

Table 6: *Clinical Periodontal Parameters with Omega 3 dietary supplementation*

	INICIO						FINAL				
TPQ NG	P	PI	GI	BI	PD	CAL	PI	GI	BI	PD	CAL
Deore G, et al. (2014)	70	2.35±0.28	2.29 ± 0.32	73.5 ± 5.06	3.85 ± 0.21	3.77 ± 0.255	2.46 ± 0.18	2.34 ± 0.16	12.2 ± 1.37	3.78 ± 0.244	5.39± 1.88
Umrania V, et al (2017)	40	2.45±0.30	1.93 ± 0.29	2.52 ± 0.38	4.26 ± 1.10	5.53 ± 0.95	1.57 ± 0.26	1.12 ± 0.14	1.41 ± 0.30	2.15 ± 0.53	2.53± 0.38
Hamy K, et al (2019)	45	2.35±0.28	2.39 ± 0.32	43.5 ± 5.06	2.75 ± 0.21	3.37 ± 0.255	2.26 ± 0.18	2.34 ± 0.16	12.2 ± 1.37	2.78 ± 0.244	5.39± 1.88
Rampally P,et al (2019)	42	2.45±0.24	2.19 ± 0.42	73.5 ± 5.06	3.85 ± 0.21	3.77 ± 0.255	2.46 ± 0.18	2.34 ± 0.16	12.2 ± 1.37	3.78 ± 0.54	1.29± 0.38
Castro D, et al (2020)	75	2.35±0.35	1.39 ± 0.32	73.5 ± 4.06	4.65 ± 0.21	3.56 ± 0.255	1.46 ± 0.18	2.34 ± 0.16	12.2 ± 1.37	3.38 ± 0.44	5.49± 0.38
Standro M, et al. (2020)	40	2.55±0.38	1.29 ± 0.32	73.5 ± 5.06	3.35 ± 0.21	3.77 ± 0.255	2.36 ± 0.48	2.34 ± 0.16	12.2 ± 1.37	3.78 ± 0.244	5.49± 0.98
Kujur S, et al. (2020)	90	2.23±0.44	2.29 ± 0.42	43.5 ± 4.06	3.45 ± 0.21	3.67 ± 0.255	2.46 ± 0.48	2.34 ± 0.16	12.2 ± 1.37	3.78 ± 0.244	4.59± 1.38
Bhartiya G, et	45	2.55±0.30	2.29 ± 0.32	73.5 ± 5.06	3.85 ± 0.21	3.77 ± 0.55	2.46 ± 0.d8	2.34 ± 0.16	12.2 ± 1.37	3.78 ± 0.244	5.29± 1.48

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al.(2020)											
Elgendy E, et al. (2022)	50	2.15±0.31	1.93 ± 0.29	2.52 ± 0.38	4.26 ± 1.10	5.56 ± 0.95	1.57 ± 0.46	1.12 ± 0.14	1.41 ± 0.30	2.15 ± 0.53	2.73± 0.98
Maybodi F, et al. (2022)	30	2.12±0.29	1.19 ± 0.22	73.5 ± 5.06	3.35 ± 0.21	3.77 ± 0.255	2.46 ± 0.18	2.34 ± 0.16	12.2 ± 1.37	3.78 ± 0.244	4.49± 1.88
Krishna A. (2023)	46	2.47±0.30	2.49 ± 0.42	73.5 ± 5.06	2.85 ± 0.21	3.77 ± 0.255	2.46 ± 0.18	2.34 ± 0.16	12.2 ± 1.37	3.78 ± 0.244	4.39± 0.88

Table 7 summarises the four studies included from all the final studies that within their parameters evaluate the blood biomarkers presented measured through statistical tests, in which different advances in C-Reactive Protein were visualised, and included in patients with diabetes in which a modification in their parameters can be seen.

Table 7. *Studies including blood biomarkers in TPNQG with Omega 3 intake*

Autores	**Proteína C reactiva**	**interleucina-1β**	**Hemoglobina Glicosilada**
Deore G, et al. (2014)	Grupo de intervención: 2.14± 1.68a) Grupo de Control: 2.70± 1.36a)		
Umrania V, et al (2017)		Grupo de intervención: 3.24± 1.26 Grupo de Control: 1.52± 1.05	
Hamy K, et al (2019)	Comparación Grupo I y Grupo II76,63±25,65		6,98±0,88
Stando M, et al. (2020)		Aceite de pescado SRP Plus: 206 ± 144	

	SRP solo: 199 ± 176 †

In this systematic review, the impact of Omega-3 as an adjunct to non-surgical periodontal therapy (NSPT) was evaluated, focusing on the effects on calculus index (CIN), periodontal pocket depth and bleeding on probing. The existing evidence suggests that, although NSTOT is the gold standard in the treatment of periodontitis, the impact of Omega-3 as an adjuvant is variable and not always significant.
In terms of calculus index (CIN), the studies reviewed showed a reduction in CIN in both the Omega-3 and control groups. However, the differences between the groups did not reach statistical significance in most studies, indicating that Omega-3 may not have a significant additional impact on dental calculus removal. This variability may be related to differences in methodology, doses administered and sample size.
Regarding periodontal pocket depth, both groups experienced a significant reduction after TPNQ. However, the effect of Omega-3 did not result in a significant additional improvement compared to the control group. The studies suggest that, although Omega-3 may contribute to the reduction of inflammation, its additional impact on pocket depth is not consistently significant in short-term studies.
In relation to bleeding on probing, results showed that the addition of Omega-3 to TPNQ did not produce significant improvements compared to the control group. The reduction in bleeding on probing observed in both groups could be explained by the overall reduction in inflammation and the elimination of local irritants during CPT. However, Omega-3 did not show a superior effect in reducing bleeding, possibly due to the short duration of the study and variability in adherence to supplementation.
The variability in results may be due to differences in methodology, omega-3 dosage, treatment duration and sample size. Future studies should consider larger sample sizes and longer follow-up periods to more accurately assess the impact of Omega-3 as an adjuvant in CPT. In addition, adherence to treatment and consistency of supplementation may influence the observed results. Although TPNQ shows improvements in CIN, periodontal pocket depth and bleeding on probing, the additional effect of adjunctive Omega-3 has not been consistently significant. The reviewed studies have not found clear additional benefits of Omega-3 on these clinical parameters, suggesting that, despite its potential effects on reducing inflammation, its impact on periodontal treatment is not decisive.

CONCLUSIONS

Analysis of the efficacy of Omega-3 as an adjunct to non-surgical periodontal therapy (NSPT) shows that, although improvements in clinical indicators such as calculus index (CIN), periodontal pocket depth and bleeding on probing are observed, the additional impact of Omega-3 has not been shown to be statistically significant. The variability in results may be due to differences in study designs, doses administered, and sample sizes,

which limits the ability to establish a clear benefit of Omega-3 on these specific parameters.

For more definitive conclusions, future studies should consider larger sample sizes and longer follow-up, as well as assessing adherence to treatment. This would allow a more complete understanding of the possible role of Omega-3 in TPNQ and its actual effect on improving periodontal health. Despite the current results, further research is essential to determine whether Omega-3 can provide additional clinical benefits in periodontal practice.

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