

# Is Reported Fish Intake Reflected in the Plasma Phospholipid Content of Marine n-3 Polyunsaturated Fatty Acids in Patients with End-Stage Renal Disease?

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## Introduction

Patients with end-stage renal disease (ESRD) have a very high premature mortality. Most deaths are caused by cardiovascular complications and almost 30% are due to sudden cardiac death (SCD).

The marine n-3 polyunsaturated fatty acids (PUFA), docosahexaenoic acid (DHA), eicosapentaenoic acid (EPA) and docosapentaenoic acid (DPA) are essential fatty acids mainly derived from fatty fish.

A high intake of marine n-3 PUFAs is associated with a reduced risk of SCD and cardiovascular complications in the general population and in patients with ESRD. Nevertheless, previous studies have reported that patients with ESRD have a low intake of fish and a low content of marine n-3 PUFA in plasma and platelets.

## Aim

To examine to what extent reported fish intake was reflected in the content of n-3 PUFAs in plasma phospholipids in patients with ESRD.

## Methods

A cross-sectional study of 169 unselected chronic dialysis patients with age > 18 years and dialysis > 3 months.

## Fish intake assessed by a questionnaire with two questions

1. How often do you eat fish for lunch?

2. How often do you eat fish for dinner?

A score was given according to the following: never eating fish=1; eating fish once a month=2, eating fish 2-3 times a month=3, eating fish once a week=4, eating fish 2-3 times a week=5 and eating fish every day=6. Hence, the total fish score for lunch and dinner could range from 2-12.

## Analysis of content of n-3 PUFAs in plasma phospholipids

Non-fasting blood samples were flushed with liquid nitrogen to avoid oxidation and stored at -80 °C. Total lipids were extracted from the plasma sample and the phospholipid fraction was isolated. The fatty acid composition was measured in the phospholipid fraction of plasma gas chromatography (Varian 3900, Varian, Middleburg, The Netherlands) and the results expressed as weight percent (wt %) of total fatty acids.

## Results

Baseline characteristics are summarized in **Table 1**.

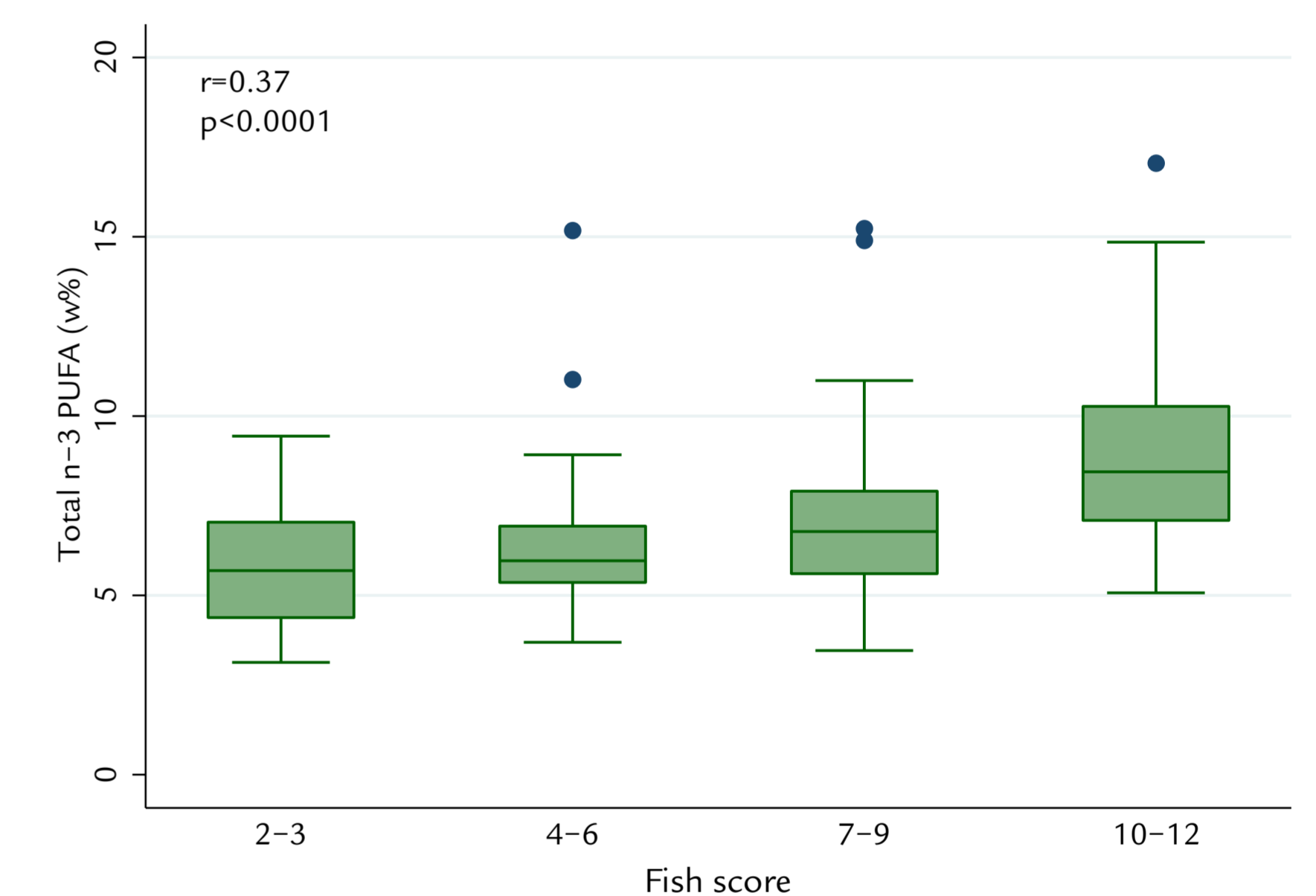
Mean plasma phospholipid content of marine n-3 PUFAs are listed in **Table 2**.

Reported fish intake (Fish score) was positively associated with the content of n-3 PUFAs in plasma phospholipids (**Figure 1 & Table 2**). Mean fish score was 6.8.

22 patients reported a supplemental intake of fish oil capsules not included in the fish score. Exclusion of these patients from the analysis did not change the results (e.g.  $r=0.35$ ,  $P<0.0001$  for total marine n-3 PUFAs).

Variables	
Age, years	62.3 ± 14.1
Sex, male	110 (65.1%)
Diabetes mellitus	60 (35.5%)
Coronary heart disease	52 (30.8%)
Dialysis vintage, years	1.8 [0.6; 5.7]
Dialysis modality	
In-center dialysis (HD & HDF)	141 (83.4%)
Home hemodialysis	16 (9.5%)
Peritoneal dialysis	12 (7.1%)

**Table 1.** Baseline characteristics (n=169)



**Figure 1.** Fish intake and total n-3 PUFAs in plasma phospholipids.

Variables	Mean content, wt%	Correlation to fish score	p-value
EPA	1.70 ± 1.21	0.30	0.0001
DHA	4.25 ± 1.23	0.39	<0.0001
DPA	1.11 ± 0.22	-0.002	0.98
Total Marine n-3 PUFAs (EPA+DHA+DPA)	7.07 ± 2.28	0.37	<0.0001

**Table 2.** Mean contents of marine n-3 PUFAs in plasma phospholipids

## Conclusion

In patients with ESRD, reported fish intake was positively associated with the content of both EPA, DHA and total marine n-3 PUFAs in plasma phospholipids. The correlation was only moderate, which might be explained by lack of distinction between lean or fatty fish in the questionnaire. The result indicates that reported fish intake in patients with ESRD only to some extent is able to predict the content of n-3 PUFAs in plasma.



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## Disclosures

None.

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