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Association between fish consumption and the risk of gastrointestinal cancers: A meta-analysis of prospective cohort studies

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202590104

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 25 September 2025 and was last updated on 25 September 2025.

INTRODUCTION

Review question / Objective This meta-analysis aims to systematically evaluate this association.

Condition being studied Dietary factors are considered key modifiable risk factors influencing their development. Previous studies on the association between fish consumption and the risk of specific GI cancers have yielded inconsistent and sometimes contradictory results.

METHODS

Search strategy #1. (("Seafood"[Mesh] OR "Fish Products"[Mesh]) OR (fish[tiab] OR seafood[tiab] OR "fatty fish"[tiab] OR "lean fish"[tiab] OR salmon[tiab] OR tuna[tiab] OR sardine[tiab] OR cod[tiab] OR mackerel[tiab] OR herring[tiab])) #2. (("Gastrointestinal Neoplasms"[Mesh] OR ("Digestive System Neoplasms"[Mesh] OR (gastrointestinal cancer*[tiab] OR digestive cancer*[tiab] OR gastric cancer*[tiab] OR stomach

cancer*[tiab] OR colorectal cancer*[tiab] OR colon cancer*[tiab] OR rectal cancer*[tiab] OR esophageal cancer*[tiab] OR oesophageal cancer*[tiab]))

#3. (("Cohort Studies"[Mesh] OR "Prospective Studies"[Mesh] OR "Longitudinal Studies"[Mesh]) OR (cohort[tiab] OR prospective[tiab] OR longitudinal[tiab] OR follow-up[tiab]))

#4. #1 AND #2 AND #3.

Participant or population Participants were healthy adults without prior GI cancer.

Intervention Highest fish consumption.

Comparator Lowest fish consumption.

Study designs to be included Prospective cohort design.

Eligibility criteria Studies were included if they met the following criteria: (1) prospective cohort design; (2) participants were healthy adults without prior GI cancer; (3) exposure was clearly defined

fish consumption, with at least two intake levels and a described assessment method; (4) outcome was incidence of a GI cancer (EC, GC, CRC, PC, or LC); and (5) key data (effect estimates, sample size, event counts) were directly available or calculable.

Information sources We systematically searched PubMed, Embase, Cochrane Library, and Web of Science from their inception until August 31, 2025, for prospective cohort studies investigating the association between fish consumption and GI cancer risk.

Main outcome(s) Outcome was incidence of a GI cancer (EC, GC, CRC, PC, or LC).

Quality assessment / Risk of bias analysis The methodological quality of the included studies was assessed using the Newcastle-Ottawa Scale (NOS), which scores studies across three domains (selection, comparability, and outcome) on a 9-point scale.

Strategy of data synthesis The pooled effect size was expressed as RR with 95%CI, comparing the highest vs. lowest category of fish consumption. A random-effects model was used to account for anticipated heterogeneity.

Subgroup analysis Subgroup analyses were conducted based on region, sex, follow-up time, and degree of confounder adjustment. Subgroup differences were tested using interaction tests, reported as ratio of RRs (RRR) with 95%CI.

Sensitivity analysis Sensitivity analysis was performed by sequentially excluding each study to test the robustness of the results.

Language restriction No restriction.

Country(ies) involved China.

Keywords fish consumption; gastrointestinal cancers; systematic review; meta-analysis.

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