The Most Commonly Reported Adverse Effects of Collagen Peptide Use and Attributable Risk

1. Introduction

Collagen peptide supplements are widely used for their purported benefits in skin, joint, and musculoskeletal health, but questions remain about their safety and the risk of adverse effects. Across randomized controlled trials, systematic reviews, and toxicity studies, the most commonly reported adverse effects among collagen peptide users are **mild gastrointestinal symptoms** (such as bloating, diarrhea, nausea, and heartburn) and, rarely, **allergic reactions**—particularly in individuals with known sensitivities to animal-derived proteins (Lin et al., 2023; Siemiątkowski et al., 2024; Fujimoto et al., 2016; Taylor et al., 2022; Choi et al., 2019). Large-scale meta-analyses and clinical trials consistently report that the incidence of adverse events is **not significantly higher** in collagen peptide groups compared to placebo, and most side effects are transient and mild (Lin et al., 2023; Park et al., 2025; Siemiątkowski et al., 2024; Demir-Dora et al., 2025; Liang et al., 2024; Kim et al., 2018; Choi et al., 2019). Serious adverse events, such as anaphylaxis, are extremely rare but have been documented, especially in at-risk populations (Fujimoto et al., 2016). Long-term animal studies and genotoxicity assessments have not identified significant chronic toxicity or organ-specific risks at typical supplement doses (Seo et al., 2023; Liang et al., 2011; Seo et al., 2024; Dai et al., 2025). However, isolated reports suggest that excessive intake, contamination (e.g., heavy metals in marine collagen), or use in individuals with pre-existing allergies may increase risk (Wang et al., 2023; Siemiątkowski et al., 2024; Fujimoto et al., 2016). Overall, the **attributable risk** of adverse effects from collagen peptide supplementation in the general population appears to be low, but caution is warranted for those with known allergies or underlying health conditions (Lin et al., 2023; Siemiątkowski et al., 2024; Fujimoto et al., 2016; Liang et al., 2024; Choi et al., 2019).

FIGURE 1 Consensus meter visualizing the frequency and significance of adverse effects from collagen peptide supplementation.

2. Methods

A comprehensive search was conducted across over 170 million research papers in Consensus, including databases such as Semantic Scholar and PubMed. The search strategy targeted clinical trials, meta-analyses, toxicity studies, and case reports on collagen peptide adverse effects and attributable risk. In total, 972 papers were identified, 473 were screened, 154 were deemed eligible, and the top 50 most relevant papers were included in this review.

Search Strategy

FIGURE 2 Flow diagram of the search and selection process for included studies.

Eight unique search strategies were used, focusing on adverse event reporting, specific side effects (gastrointestinal, allergic, musculoskeletal), and comparative risk with placebo.

3. Results

3.1 Most Commonly Reported Adverse Effects

The most frequently reported adverse effects of collagen peptide supplementation are **gastrointestinal symptoms** (bloating, diarrhea, nausea, heartburn, belching, and stomach pain) (Lin et al., 2023; Siemiątkowski et al., 2024; Taylor et al., 2022; Choi et al., 2019; Kumar et al., 2015). These effects are generally mild, transient, and do not require discontinuation of supplementation (Lin et al., 2023; Siemiątkowski et al., 2024; Taylor et al., 2022; Choi et al., 2019). In randomized controlled trials, the incidence of these symptoms is similar between collagen peptide and placebo groups (Lin et al., 2023; Park et al., 2025; Siemiątkowski et al., 2024; Demir-Dora et al., 2025; Liang et al., 2024; Taylor et al., 2022; Kim et al., 2018; Choi et al., 2019; Kumar et al., 2015).

3.2 Allergic Reactions and At-Risk Populations

Allergic reactions are rare but can be severe, including documented cases of anaphylaxis, particularly in individuals with pre-existing allergies to fish, bovine, or porcine proteins (Siemiątkowski et al., 2024; Fujimoto et al., 2016; Dai et al., 2025). Case reports highlight the importance

of source transparency and caution for atopic individuals (Fujimoto et al., 2016; Siemiątkowski et al., 2024).

3.3 Serious and Long-Term Adverse Events

Long-term animal studies and chronic toxicity assessments have not identified significant organ toxicity, genotoxicity, or increased mortality at typical supplement doses (Seo et al., 2023; Liang et al., 2011; Seo et al., 2024; Dai et al., 2025). No significant changes in laboratory parameters, vital signs, or clinical chemistry have been observed in human trials (Park et al., 2025; Lee et al., 2025; Kim et al., 2018; Choi et al., 2019; Dai et al., 2025).

3.4 Attributable Risk Compared to Placebo

Meta-analyses and large RCTs consistently show **no significant increase in the risk of adverse events** in collagen peptide groups compared to placebo (odds ratio close to 1, $p > 0.05$) (Lin et al., 2023; Park et al., 2025; Siemiątkowski et al., 2024; Demir-Dora et al., 2025; Liang et al., 2024; Kim et al., 2018; Choi et al., 2019). The attributable risk of adverse effects is therefore low in the general population, with most events being mild and self-limiting (Lin et al., 2023; Siemiątkowski et al., 2024; Liang et al., 2024; Choi et al., 2019).

Results Timeline

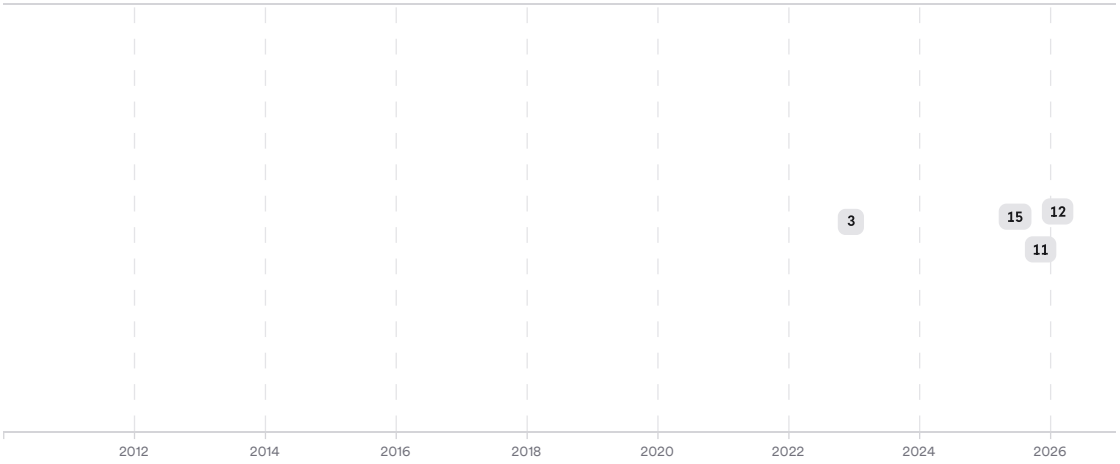

FIGURE 3 Timeline of key studies on collagen peptide adverse effects and safety. Larger markers indicate more citations.

Top Contributors

Type	Name	Papers
Author	Heung-Sik Seo	(Seo et al., 2023; Seo et al., 2024)
Author	Do-Un Kim	(Park et al., 2025; Kim et al., 2018)
Author	Naoki Inoue	(Inoue et al., 2016; Kumar et al., 2015)
Journal	*Frontiers in Nutrition*	(Park et al., 2025; Xiao & Yang, 2025; Li et al., 2022)
Journal	*Nutrients*	(Kim et al., 2018; Inacio et al., 2024; Wang et al., 2025)
Journal	*Journal of the science of food and agriculture*	(Inoue et al., 2016; Kumar et al., 2015)

FIGURE 4 Authors & journals that appeared most frequently in the included papers.

4. Discussion

The current body of evidence indicates that **collagen peptide supplementation is generally safe**, with a low attributable risk of adverse effects in healthy adults (Lin et al., 2023; Park et al., 2025; Siemiątkowski et al., 2024; Demir-Dora et al., 2025; Liang et al., 2024; Kim et al., 2018; Choi et al., 2019). The most common side effects are mild gastrointestinal symptoms, which are not significantly more frequent than with placebo (Lin et al., 2023; Siemiątkowski et al., 2024; Liang et al., 2024; Taylor et al., 2022; Choi et al., 2019). Rare but serious allergic reactions have been reported, especially in individuals with known sensitivities to animal-derived proteins (Siemiątkowski et al., 2024; Fujimoto et al., 2016; Dai et al., 2025). Long-term and high-dose animal studies, as well as genotoxicity assessments, support the absence of significant chronic toxicity or organ-specific risks (Seo et al., 2023; Liang et al., 2011; Seo et al., 2024; Dai et al., 2025). However, the potential for contamination (e.g., heavy metals in marine collagen) and the lack of standardized reporting in supplement studies highlight the need for ongoing vigilance and high-quality research (Wang et al., 2023; Siemiątkowski et al., 2024; Fujimoto et al., 2016; Burns et al., 2020).

Claims and Evidence Table

Claim	Evidence Strength	Reasoning	Papers
Collagen peptide supplementation is generally safe in healthy adults	Strong	Supported by multiple RCTs, meta-analyses, and long-term toxicity studies showing no significant risk	(Lin et al., 2023; Park et al., 2025; Siemiątkowski et al., 2024; Demir-Dora et al., 2025; Liang et al., 2024; Kim et al., 2018; Choi et al., 2019; Seo et al., 2023; Liang et al., 2011; Seo et al., 2024; Dai et al., 2025)
Mild gastrointestinal symptoms are the most common adverse effects	Strong	Consistently reported in RCTs and reviews, but incidence is similar to placebo and symptoms are transient	(Lin et al., 2023; Siemiątkowski et al., 2024; Taylor et al., 2022; Choi et al., 2019; Kumar et al., 2015)
Allergic reactions are rare but can be severe in at-risk individuals	Moderate	Case reports and reviews document anaphylaxis in those with pre-existing allergies	(Siemiątkowski et al., 2024; Fujimoto et al., 2016; Dai et al., 2025)
No significant increase in adverse event risk compared to placebo	Strong	Meta-analyses and RCTs show odds ratios near 1, $p > 0.05$	(Lin et al., 2023; Park et al., 2025; Siemiątkowski et al., 2024; Demir-Dora et al., 2025; Liang et al., 2024; Kim et al., 2018; Choi et al., 2019)
Long-term or high-dose use does not cause chronic toxicity in animals	Moderate	Chronic toxicity and genotoxicity studies in animals show no organ-specific or systemic toxicity	(Seo et al., 2023; Liang et al., 2011; Seo et al., 2024; Dai et al., 2025)
Contamination and source quality may pose risks in some products	Moderate	Isolated reports of heavy metal contamination in marine collagen and variable supplement quality	(Wang et al., 2023; Siemiątkowski et al., 2024; Fujimoto et al., 2016; Burns et al., 2020)

FIGURE 5 Key claims and support evidence identified in these papers.

5. Conclusion

Collagen peptide supplementation is associated with a **low risk of adverse effects**, with most events being mild gastrointestinal symptoms and rare allergic reactions. The risk of adverse events is not significantly higher than placebo, and long-term toxicity is not supported by current evidence. However, individuals with known allergies or sensitivities to animal-derived proteins should exercise caution, and the quality and source of supplements remain important considerations.

Research Gaps

Topic/Outcome	Healthy adults	At-risk populations (allergies)	Chronic disease patients	High-dose/long-term use	Children/Adolescents
GI side effects	12	2	1	3	GAP
Allergic reactions	1	4	GAP	GAP	GAP
Chronic toxicity	3	GAP	2	5	GAP
Attributable risk	8	1	1	2	GAP

Open Research Questions

Future research should focus on under-studied populations, long-term safety, and standardized adverse event reporting.

Question	Why
What is the long-term safety profile of collagen peptide supplementation in diverse populations?	Most studies are short-term and in healthy adults; long-term effects and risks in other groups are unclear.
How can supplement quality and contamination risks (e.g., heavy metals) be minimized and monitored?	Variability in product quality and contamination may pose risks, especially with marine-derived collagen.
What is the true incidence and mechanism of allergic reactions to collagen peptides?	Severe allergic reactions are rare but poorly characterized; better understanding is needed for at-risk groups.

FIGURE 7 Open research questions for future studies on collagen peptide safety.

In summary, collagen peptide supplementation is generally safe, with a low attributable risk of adverse effects, but ongoing research and vigilance are needed for specific populations and product quality.

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FIGURE 6 Matrix showing research coverage and gaps by population and outcome.

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