



The worldwide prevalence of intestinal helminthic parasites among food handlers: A systematic review and meta-analysis

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ABSTRACT

Food handlers have a major role in transmission of food-borne parasitic infections including intestinal helminths. The objective of the present study was to assess the global prevalence of intestinal helminthic parasites among food handlers. Multiple databases (PubMed, Scopus, ProQuest, Web of Science, Science Direct and Google Scholar) were searched for literature published from 1990 to 2022. Pooled prevalence was estimated using the meta-package in R (version 3.6.1). One hundred twenty seven articles, including 220,705 individuals, were considered in this study. The global pooled prevalence (95% confidence interval) was 0.115% (0.091% - 0.141%). The highest pooled prevalence was reported from Africa (0.160%, 0.124%–0.210%). The most prevalent helminth was *Ascaris lumbricoides* (0.062%, 0.047%–0.079%). Moreover, among different countries, Ghana had the highest pooled prevalence (0.496%, 0–1.000%). This study revealed a high prevalence of intestinal helminths among food handlers. Routine parasitological investigation, food safety and personal sanitation training are recommended to prevent intestinal helminths transmitted by food handlers.

1. Introduction

Food is the most basic human requirement for survival, development, and preservation of life. Food may cause diseases by either failing to ingest adequate nutrients or consuming contaminated food (Prabhu & Shah, 2012). Foodborne diseases with major socio-economic burden on the human population, are among the most serious public health concerns. The annual cases of foodborne diseases were more than 590 million, with 420,000 deaths attributable to the consumption of contaminated food globally (Lee & Yoon, 2021).

Nowadays, with the progression of globalisation as well as active food trade among countries, foodborne infections are associated with more serious outbreaks. Parasitic infections that are transmittable through food are substantially responsible for the global burden of disease (Torgerson et al., 2014). It has been estimated that approximately 300 million people have severe morbidity due to intestinal helminths, of

which 10,000–135,000 deaths occur per year. These parasites are more prevalent in tropical and subtropical regions, especially among communities with poverty, poor hygiene, and in developing countries (Husen et al., 2022).

Soil-transmitted helminths (STHs) such as *Ascaris lumbricoides*, *Trichuris trichiura*, and hookworms (*Necator americanus* and *Ancylostoma duodenale*) are the well-known causes of intestinal parasites, affecting 807 million, 604 million, and 576 million people, respectively (Mascari-Serra, 2011). These parasites infect humans through the consumption of contaminated vegetables, cucurbits, and fruits (Eslahi et al., 2021).

Contamination of food with parasites such as intestinal helminths is still a common and persistent public health issue (Eslahi et al., 2021, 2022). Intestinal helminth infections not only have a financial burden but also are the cause of several long-term conflicts, including anaemia related to iron deficiency, growth failure in children, along with physical

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