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### en Foodborne intestinal protozoan infection and associated factors among patients with watery diarrhea in Northern Ethiopia; a cross-sectional study

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#### ABSTRACT

**Background:** Intestinal protozoa are parasites transmitted by consumption of contaminated water and food and mainly affect children and elder people and cause considerable health problems. They are the leading causes of outpatient morbidity due to diarrhea in the developing countries. So, assessing water and food source of diarrheal patients and identifying the main associated factors for transmission of protozoan parasitic infections help for effective control measures of protozoan infections. Hence, the current study was aimed at determining the prevalence of foodborne intestinal protozoa infections and associated factors among diarrheic patients in North Ethiopia.

**Methods:** A health facility based cross-sectional study was conducted among 223 patients with watery diarrhea in four selected government health facilities in North Ethiopia from November 2016–June 2017. A structured questionnaire was used to collect data on socio-demography of study participants and factors associated with foodborne protozoa infections. The diarrheic stool samples were collected, transported, and processed using direct wet mount, formal-ether concentration and modified Ziehl-Neelsen staining methods. The data were analyzed using SPSS version 21 and descriptive statistics, bi-variate, and multivariate logistic regressions were computed.  $P$ -value  $< 0.05$  at 95% confidence interval was considered statistically significant.

**Results:** The overall prevalence of foodborne protozoa infection was 101 (45.3%). The predominant protozoa species identified was *Entamoeba histolytica/dispar* <sup>sp</sup> 55 (24.7%), followed by *Giardia intestinalis* <sup>sp</sup> 25 (11.2%) and *Cryptosporidium* <sup>sp</sup> species 5 (2.2%). The highest proportion of protozoa infection was observed among males (23.3%) and the age group 15–24 years (13.5%). Statistically significant associations were observed between foodborne protozoan infection and not using any type of recipe to decontaminate salads and fruits (AOR = 2.64, 95 CI: 1.34–5.19,  $P = 0.005$ ) and using vinegar as a decontaminant (AOR = 2.83, 95 CI: 1.24–6.48,  $P = 0.014$ ). Eating out (meals at a restaurant) on the other hand was found to be protective for foodborne protozoan infection (AOR = 0.43, 95 CI: 0.23–0.78,  $P = 0.006$ ).

**Conclusion:** Our study revealed that foodborne protozoa infections are of public health significance in the study area. Vinegar, which is frequently used as a recipe for decontaminating salads and fruits, is inversely related to foodborne protozoa parasite infection.

#### KEYWORDS

**Food borne; Protozoa; Diarrheal; Ethiopia**

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