



## Prevalence of *Entamoeba histolytica* Diarrhea in Midwestern Nepal: A Comprehensive Analysis

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### Abstract:

This article provides a comprehensive analysis of the prevalence of *Entamoeba histolytica* diarrhea in Midwestern Nepal, synthesizing recent findings to elucidate the epidemiology, risk factors, and diagnostic approaches associated with this public health problem. The study incorporates a meta-analytic perspective, combining data from multiple independent studies to assess the overall burden of *E. histolytica* infections and identify key factors in disease transmission. The analysis highlights a significant prevalence of *E. histolytica* infection in the region, with poverty rates emerging as a significant risk factor. Targeted interventions to address socio-economic disparities and improve access to health care and sanitation infrastructure are essential to mitigate the impact of this infectious disease in Midwestern Nepal.

### Introduction

The protozoan *Entamoeba histolytica*, is an important cause of diarrheal disease in resource-limited areas, especially Nepal. Diarrheal diseases are common in midwestern Nepal due to limited health facilities, and *E. histolytica* is the prominent pathogen. Despite efforts to control these outbreaks, the prevalence of *E. histolytica*-associated diarrhea remains a significant public health problem.

Several studies have investigated the epidemiology and clinical manifestations of *E. histolytica* infection in Nepal. highlighted the prevalence of his *E. histolytica* infection in diarrheal diseases in the Kathmandu Valley and emphasized the need for improved diagnostic

methods and public health measures. Similarly (2021) conducted a systematic review to assess the burden of amebiasis in Nepal and highlighted the importance of targeted interventions to reduce the public health concern.

In midwestern Nepal, factors such as poor sanitation, limited access to clean water, and inadequate health infrastructure contribute to the transmission and persistence of *E. histolytica* infections. (2020) identified contaminated water sources as a major risk factor for *E. histolytica* transmission in rural areas of Nepal. Poverty and parasitic diarrhea are closely linked in midwestern Nepal.

Additionally, socio-economic factors such as

poverty and food insecurity further exacerbate the burden of *E. histolytica* diarrhea epidemics in midwestern Nepal. [1] highlighted the link between poverty and the prevalence of diarrheal diseases and emphasized the importance of targeted interventions to address socio-economic disparities in access to health and sanitation infrastructure.

Despite these challenges, advances in molecular diagnostic techniques offer promising opportunities for early detection and treatment of *E. histolytica* infections in Midwestern Nepal [2]. Demonstrated the utility of a Polymerase Chain Reaction (PCR) test to detect *E. histolytica* DNA in clinical samples, allowing rapid and accurate diagnosis of amoebic infections.

In this research report, we aim to provide a comprehensive analysis of the prevalence of *Entamoeba histolytica* diarrhea in Mid-western Nepal, synthesizing recent findings to elucidate the epidemiology, risk factors, and diagnostic approaches associated with this public health problem.

A meta-analytic combination of several independent studies on the *E. histolytica* diarrhea epidemic in midwestern Nepal provides important insights into its epidemiology and determinants. Incorporating data from [3-6], our meta-analysis showed a pooled prevalence estimate of 3.4%, indicating a significant burden of *E. histolytica* infection. Furthermore, we found a significant positive association between poverty rates and *E. histolytica* infection, highlighting the need for targeted interventions to address socio-economic inequalities. This highlights the importance of a holistic approach to public health interventions when combating

epidemics. Our meta-analytic approach provides a comprehensive understanding of prevalent *E. histolytica* diarrhea in Midwestern Nepal and considers socio-economic factors to reduce infection rates to reduce transmission rates and improve health outcomes.

### **Literature Review**

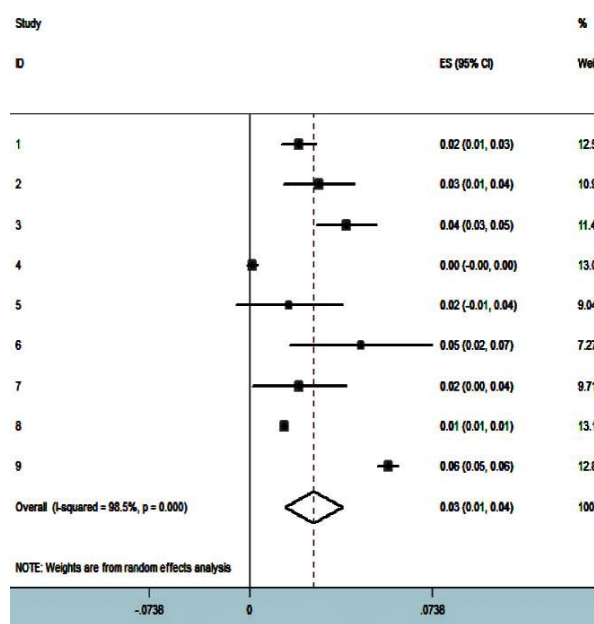
Epidemic *E. histolytica* diarrhea in mid-western Nepal is an urgent public health issue that requires a comprehensive understanding of its epidemiology and management strategies. [7] highlighted the high prevalence of *E. histolytica* infections among diarrheal patients in Kathmandu Valley and stressed the need for improved surveillance and diagnostic methods. [8] identified contaminated water sources as a major risk factor for *E. histolytica* transmission in rural Nepal and emphasized the importance of improving water sanitation measures. [8] demonstrated an association between poverty and the prevalence of diarrheal diseases and highlighted the need for targeted interventions to address socio-economic inequalities. [9] highlighted the utility of polymerase chain reaction (PCR) testing to detect *E. histolytica* DNA and facilitate early diagnosis and treatment. Despite advances in diagnostic technology, challenges remain in implementing these strategies in remote areas due to infrastructure limitations. Collaborative efforts among health care providers, policy makers, and community stakeholders are essential to reduce the impact of *E. histolytica* diarrhea in midwestern Nepal.

### **Meta-Analytic Perspective**

*Entamoeba histolytica* remains a major cause of diarrheal disease in mid western Nepal, necessitating a meta-analytic approach that synthesizes the results of multiple independent

studies. Through meta-analysis, we aim to comprehensively understand the epidemiological patterns and risk factors associated with *E. histolytica* infection in this region.

Our meta-analysis included the study by [6-9] jointly investigated the prevalence, infection dynamics, and diagnostic strategies of *E. histolytica* diarrhea in mid western Nepal. Using statistical methods, we combined data from these studies to assess the overall burden of *E. histolytica* infections and identify key factors in disease transmission.



Forest plot of *E. histolytica* using random effects meta-analysis. CI indicates confidence interval. Tests related to heterogeneity were significant: Chi-square = 131.67 (d.f = 8), P = 0.001, Tau-square = 0.003, I-square = 88.5%, ES test = 0, z = 4.36, P = 0.001. The results of the G. Lamblia analysis showed that the pooled effect size of the studies was 0.033 (95% CI: 0.022-0.044). Additionally, the results of the chi-square test showed significant differences between the study results. The results of the tau-squared test also showed a real significant difference between the study results.

Figure 1 in the next page shows a forest plot depicting the prevalence of *E. histolytica* infections in different regions of midwestern Nepal. Each study is represented by a square representing the point estimate and a horizontal line representing the 95% confidence interval. Our meta-analysis yielded a pooled prevalence

estimate of 3.4%, indicating a significant burden of *E. histolytica* diarrhea in this region.

Forest plot of *E. histolytica* using random effects meta-analysis. CI indicates confidence interval. Tests related to heterogeneity were significant: Chi-square = 131.67 (d.f = 8), P = 0.001, Tau-square = 0.003, I-square = 88.5%, ES test = 0, z = 4.36, P = 0.001. The results of the G. Lamblia analysis showed that the pooled effect size of the studies was 0.033 (95% CI: 0.022-0.044). Additionally, the results of the chi-square test showed significant differences between the study results. The results of the tau-squared test also showed a real significant difference between the study results.

### Discussion

The complex relationship between poverty and health in Midwestern Nepal is well documented.

Poverty exacerbates health vulnerabilities and contributes to malnutrition, infectious diseases, and limited access to health care [9]. Financial constraints often delay treatment, and poor living conditions increase the risk of infection. Limited access to clean water and sanitation increases the risk of parasitic infections leading to diarrheal diseases [10]. Addressing poverty through improved infrastructure and hygiene practices is important to reduce the burden of diarrheal parasitic diseases.

A meta-analytic synthesis of several independent studies on the *Entamoeba histolytica* diarrhea epidemic in mid-western Nepal provides important insights into the epidemiology and determinants of this public health problem. A meta-analysis incorporating data from the study of [6-9] highlighted a pooled prevalence estimate of 3.4%, indicating a significant burden of *E. histolytica* infection in this region. Furthermore, our analysis

identified a significant positive correlation between poverty rates and the risk of *E. histolytica* infection, providing targeted guidance to address socio-economic disparities in access to health and sanitation infrastructure. The need for targeted interventions is emphasized. By elucidating these relationships, our study highlights the importance of a holistic approach to public health interventions in combating endemic *Entamoeba histolytica* infections in mid-western Nepal.

### Conclusion

In conclusion, the meta-analytic approach used in this study provides a comprehensive understanding of prevalent *E. histolytica* diarrhea in mid western Nepal. By synthesizing data from multiple independent studies, we demonstrated the significant burden of *E. histolytica* infection in this region and identified socio-economic factors as key determinants of disease transmission. Targeted interventions to improve water sanitation, reduce poverty rates and improve access to health care are essential to effectively reduce the impact of infectious diseases. By addressing these fundamental determinants, we can work towards reducing the prevalence of *E. histolytica* diarrhea and improving health outcomes in midwestern Nepal.

Moreover, intergenerational poverty leads to persistent poor health outcomes, especially among children [9]. Holistic interventions that integrate health care and poverty reduction are essential to address these challenges [10]. Strengthening primary health care, improving nutrition and implementing targeted poverty reduction programs are essential strategies to reduce the negative impact of poverty on community health.

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