



# STUDY OF PREVALENCE OF INTESTINAL PARASITES IN FOOD HANDLERS IN MANGALORE

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## ABSTRACT

**Introduction:** Food-handlers with a poor personal hygiene and dirty habits could be potential sources of infection due to pathogenic microorganisms. The study was undertaken to determine the prevalence of intestinal protozoan and helminthic parasites among food handlers in a hostel and canteen.

**Objectives:** To detect the intestinal protozoan and helminthic parasites in the stool samples of food handlers and to correlate parasitic infection levels with hygiene and educational level

**Materials and Methods:** Faecal samples of 197 food-handlers were collected of both sexes working in the hostel mess and canteen of Kasturba Medical College and Hospital, Mangalore for a period of one year. The collected faecal samples were subjected to direct microscopic examination using saline and iodine wet mount and concentration technique using formalin-ethyl acetate and staining the smears by modified Ziehl-Neelsen's method.

**Result:** Among the 197 food-handlers included in the study 114 were males and 83 were females. There were no RBC, ova, trophozoites or cyst in the stool samples tested. Pus cells were found only in 18 samples. However none of the food-handlers were found positive for protozoan cysts and helminthic ova.

**Conclusion:** There was no prevalence of parasitic infection among the food handlers. The findings highlight that food-handlers working in our institution have good-personal hygiene and good health education. Moreover all food handlers used personal protective equipment and take good care while handling food.

**Key Words:** Protozoa ova, Helminthic eggs, Food handlers

## INTRODUCTION

Food is a basic requirement and is necessary for survival of all living beings. Intestinal parasitic infections are among the most common infections worldwide. Food handlers with poor hygiene could be the source of intestinal parasitic infections. Improper handling of food and lack of regular hand washing habits may lead to spread of pathogens from food handlers to the consumers<sup>1</sup>. Food-borne diseases have been affecting large number of people worldwide and is an important public health problem<sup>2</sup>.

Food-handlers with poor personal hygiene working in hotels, hostel mess and other catering services have been reported to be potential sources of intestinal helminths and protozoa from many developed and developing countries all over the world<sup>1,2,3,4,5</sup>. Strong association

between personal hygiene of food handlers and intestinal parasitic infections was observed by few of the North Indian studies especially from Amritsar and Sholapur cities<sup>6,7,8</sup>. However there are no reported or published cases of food handlers being identified as potential sources of infection from this part of the country. Hence an attempt is made in the present study to screen food handlers in hostel mess and canteen to know the prevalence of parasitic infections among food handlers in this part of the country.

## MATERIALS & METHODS

This is a cross sectional study conducted for a period of one year, which included 197 food-handlers working in the hostel mess (n=09) and canteen (n=03) of Kasturba

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Medical College (KMC) and KMC Hospital, Mangalore. This study was approved by the Institutional ethics committee. Food handlers who were not on any treatment for intestinal ailment for three months prior to the study were included in screening test. Exclusion criteria included persons suffering from diarrhoeal diseases and those on therapy for intestinal infections. A structured questionnaire was given to the participants for collecting information like age, sex, education level, and hygienic status of each food-handler.

Three faecal samples on alternate days were collected from each food handler in a sterile, dry container and transported to the laboratory within one hour of collection. Macroscopic examination<sup>9</sup> was done with the naked eye for the colour, consistency, mucus and presence of worms. Direct microscopic examination<sup>10</sup> was done using saline and iodine mount to demonstrate the RBC, WBC, ova, larvae, trophozoites and cysts. The Formalin-ethyl acetate concentration procedure was used to check for ova and cyst of intestinal parasites in the stool samples followed by modified Ziehl-Neelsen's staining for the detection of *Cryptosporidium* and *Isoospora* oocysts<sup>9,11</sup>. Results were summarized as frequency tables.

## RESULTS

Among 9 hostel messes and 3 canteens a total of 197 food handlers were screened for parasitic infections. Among them 114 were males and 83 were females. Pus cells were found only in 18 stool samples. RBC, ova or cyst or parasitic larvae were not detected in any of the samples screened. There were 15 workers who had the habit of nail-biting. All the workers used personal protective equipment such as gloves, apron and head caps while handling food. Among the 197 food-handlers screened, none of them were found to be positive for any intestinal ailment or any parasitic infection. Educational levels of the food handlers, adherence to hygiene and habits are as shown in Figure 1 and Table 1

## DISCUSSION

People working in cafeterias and various catering services with unhygienic habits of handling food may act as potential sources of infection as they can spread infection to the food consumers. Several authors have highlighted food handlers as means of transmission of parasitic and bacterial diseases<sup>3</sup>. In earlier studies, the most commonly reported infectious agents spread through food were *Entamoeba histolytica*, *Giardia duodenalis*, *Strongyloides stercoralis* and *Ascaris lumbricoides*. However in our study none of the food handlers harboured any parasitic ova, cysts or larval forms.

A cross-sectional study from University of Gondar, showed the prevalence of intestinal parasites to be 29.1% which involved food-handlers working in their cafeterias<sup>4</sup>. Similarly, another cross sectional study from Makkah, Saudi Arabia showed a prevalence rate of intestinal parasites to be 23%<sup>2</sup>. In all these previously reported studies most commonly detected pathogenic protozoa were *E.histolytica* (2.78%) and *G.lamblia* (1.98%).<sup>2,14</sup>

An Indian study involving mess workers from educational institute found *E.histolytica*, and *A.lumbricoides* to be harboured by these workers. Evidence of *G.lamblia* infestation was found in 5 (17.8%), *T. solium* in 2 (7.2%) and *Strongyloidosis* in 1 (3.6%) of the food handlers<sup>14</sup>. A vast majority of intestinal parasitic infections was observed in those who were either not washing their hands after visiting toilet or washing their hands improperly. Infection was also observed in those food handlers having dirty and untrimmed nails / having the habit of nail biting.<sup>14</sup> However in the present study though 11 male and 3 female food handlers had the habit of nail biting, their stool samples were negative for parasitic ova and cysts.

There were no intestinal parasites detected in the stool samples of food-handlers screened in our study. Our result contrasted the outcome of other studies which revealed presence of parasites in stool samples of food handlers. The absence of intestinal parasites among food handlers in our setup could be related to standard quality of education on good sanitation practices, especially thorough hand washing, personal hygiene measures and use of personal protective equipment like gloves, masks, head caps and aprons.

## CONCLUSION

The prevalence of intestinal parasites of the food handlers is not seen in this study. Good personal hygiene and hygienic food-handling practices are effective means of preventing the transmission of intestinal parasites from food handlers to the consumers. Effective training and education on personal hygienic habits such as thorough hand washing before work, use of personal protective equipment provided to all food handlers can help to control intestinal parasitic infections.

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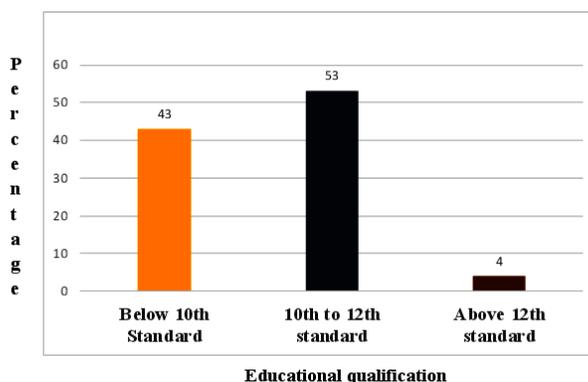


Figure 1: Education qualification of food handlers

Table 1. Compliance of food handlers to habits & hygiene

Habits and hygiene	Male		Female	
	Yes	NO	Yes	NO
Hand washing	114 (100%)	0	83 (100%)	0
Washing of vegetables & fruits	114 (100%)	0	83 (100%)	0
Use of personal protective equipment	114 (100%)	0	83 (100%)	0
Habit of nail biting	11 (9.65%)	103 (90.35)	3 (3.61%)	80 (96.39%)