Title: The influence of intestinal parasites on academic performance among primary school children in Nairobi province, Kenya

Author: Mwenji, M. Benedict

Abstract: The purpose of this study was to assess the influence of intestinal parasites on academic performance among primary school children in Nairobi Province, Kenya. Intestinal parasites belong to two main taxonomic groups: protozoa and helminths. Pathogenic protozoa are Entamoeba histolytica, Giardia lamblia and Balantidium coli while intestinal helminths comprise of nematodes hookworms (Ancylostoma duodenale and Necator americanus), Ascaris lumbricoides, Strongyloides stercoralis, Trichuris trichiura and Enterobius vermicularis, cestodes (tapeworms) and trematodes (flukes). Infected persons, especially children, suffer sub-optimal arousal levels that undermine intellectual and academic development and impaired general health. The objectives of this study were to determine the prevalence and types of intestinal parasites affecting school-age children, factors contributing to prevalence and to establish effects of intestinal parasites on academic performance. A cross-sectional design was used to investigate children in classes three to seven drawn from five primary schools. Hospital Hill school was high-cost, Parkroad and St. Teresa Girls' were medium cost and Kiboro and Daniel Comboni were low-cost schools. Data was collected using Ridley's method of stool concentration and end-of-term scores for three preceding terms and one immediate term. Data was analyzed using the SPSS software, the correlation coefficient, the Chi square, the Odds Ratio, Analysis of variance and the t-test. The highest number of infections was from Daniel Comboni (99) and lowest from Hospital Hill school (5). The highest infection rate was from Daniel Comboni (9.0%) and lowest from Hospital Hill (0.5%). The highest number of infections were caused by Entamoeba histolytica (7.4%) and lowest by hookworms (0.1%). The Odds Ratio showed pupils had 87.4 times higher risk of infection with E. histolytica than with hookworms. The factors predisposing children to infections included children's status on knowledge of intestinal parasites, attitudes towards infections, prevailing practices and unhygienic environmental factors. The highest mean performance score was from Hospital Hill (83.0) and the lowest from Kiboro (44.4). Positive association between academic performance and intestinal infections was noted in Kiboro but not in other schools. The type of school attended significantly affected performance (F=246.9, a < 0.0001) than infection by E. histolytica. Mean performances were significantly different between boys and girls (F = 14.17 ; df = 1 ; a < 0.001). Mean score for boys (60.6) was significantly lower than for girls (62.8). Females performed better than males at an average score of 4.849 (t = 3.8, a < 0.0001). Generally, uninfected children performed significantly better than the infected by an average of 9.109 ( t = 6.2, a = 0.0001). Overall prevalence was 16.4%. The most prevalent parasites were E. histolytica (7.4%) and T. trichiura (7.3%). The highest number of infections was by E. histolytica (7.4%) across all age groups. The most prominent factors predisposing to infections were failure to wash hands before meals and infrequent cleaning of toilets which attracted Fannia scalaris (latrine flies). Mean performance scores decreased from high-cost schools to low-cost schools. Infected children were two times at higher risk of performing poorer than uninfected children. The Ministry of Public Health and Sanitation and Ministry of Education should mount regular treatment programmes in schools. Public Health Education programmes
should be emphasized in all schools high level of sanitation maintained. The impact of Public Health Education in primary schools should be further investigated.