ABSTRACT
Schistosomiasis and soil-transmitted helminthiasis remain a serious public health problem that cause significant morbidity and mortality in developing countries. Fishing, car washing and use of fresh waters infested with cercariae for domestic purposes, in addition to soil contaminated by fecal matter, predispose humans to these infections. Kato-Katz has for decades been used as a reliable diagnostic method for most intestinal parasitic infections, but has major drawbacks that include low sensitivity, exposure to infectious agents in stool, and requirement to process and examine stool samples soon after collection. Thus, the combination of Kato-Katz with other diagnostic procedures that allow collection and preservation of stool samples to be processed at a later time will help in logistical organization of surveys, evaluation of effectiveness of interventions and accurate estimation of disease prevalence. This cross-sectional study sought to evaluate the performance of Kato-Katz, Mini-Parasep and Mini-FLOTAC for laboratory detection of Schistosoma mansoni and soil transmitted helminth ova. One stool sample was randomly collected from 282 mother-preschool child pairs and individuals ≥6 years from 4 villages along the shores of Lake Victoria, Mbita. Aliquots for Mini-Parasep and Mini-FLOTAC techniques were preserved in 10% and 5% formalin, respectively, before processing and microscopy, while for Kato-Katz, fresh stool was used. The recovery of intestinal helminth ova by Kato-Katz, Mini-Parasep and Mini-FLOTAC was comparable. Mini-Parasep and Mini-FLOTAC FS7 detected an additional Enterobius vermicularis and Taenia respectively. Using Kato-Katz as reference standard, Mini-Parasep showed a higher sensitivity for detecting S. mansoni (85.0%) and hookworm (33.3%) than Mini-FLOTAC FS7 (27.7% S. mansoni) and Mini-FLOTAC FS2 (8.5% S. mansoni). Kappa statistic for agreement showed a moderate agreement between Kato-Katz and Mini-Parasep (k=0.49), and a fair agreement between Kato-Katz and FS7 (k=0.28) in detecting S. mansoni ova. Using Fisher’s exact test, Mini-Parasep detected more light intensity S. mansoni infections (70.2%), while Kato-Katz detected more heavy intensity S. mansoni infections (16.5%). Spearman correlation showed a significant positive association among the techniques in estimating S. mansoni egg counts such that Kato-Katz vs FS2 was ($\Upsilon_s, 0.28, p=0.0018$), Kato-Katz vs FS7 was ($\Upsilon_s, 0.40, p=<0.0001$), Kato-Katz vs Mini-Parasep was ($\Upsilon_s, 0.68, p=<0.0001$) and FS2 vs FS7 was ($\Upsilon_s, 0.23, p=0.0085$). Mini-Parasep is a promising technique with high sensitivity for S. mansoni and hookworm eggs and is recommended to be included into schistosomiasis and soil transmitted helminth control programs as an alternative to Kato-Katz. This study also recommends the combined use of Mini-Parasep and Kato-Katz in disease surveillance and epidemiological studies to increase diagnostic sensitivity for detecting intestinal schistosomiasis.