



Sustaining a hygiene education intervention to prevent and control geohelminth infections at schools in the Peruvian Amazon

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ABSTRACT

The World Health Organization currently recommends that school-based deworming programs include health hygiene education as a complementary measure. However, the sustainability and long-term impact of such hygiene education had yet to be assessed. In July 2012, this cross-sectional study was conducted in 18 primary schools in the Peruvian Amazon to gauge continuing adherence to a health hygiene education intervention introduced 2 years earlier to reduce soil-transmitted helminth infections. Due in large part to high teacher turn-over, only 9 of 47 (19.1%) teachers were still implementing the intervention. Health hygiene education interventions must, therefore, be designed to ensure sustainability in order to contribute to the overall effectiveness of school-based deworming programs.

Key words

Helminthiasis; health education; child health; Peru.

The geohelminths *Ascaris lumbricoides*, *Trichuris trichiura*, *Ancylostoma duodenale*, and *Necator americanus* collectively infect over 2 billion of the world's poorest people (1). Often referred to as soil-transmitted helminths (STH), these intestinal parasites are estimated to cause an annual loss of 16.7 million disability-adjusted life years in school-age children, which represents 11% of the total disease burden afflicting this age group (2). In areas with high prevalence of STH infections, the World Health Organization (WHO) recommends the regular deworming of

all school-age children through school-based programs (3). Administering deworming drugs to all school-age children at risk of STH-related morbidity is one of the most cost-effective public health interventions in the world (4), but the risk of re-infection following treatment is high (5). For this reason, WHO recommends incorporating health education as an essential component of any school-based STH control program (1). Health education aims to modify behaviors associated with an increased risk of re-infection following treatment; it could, therefore, be a powerful tool in maximizing the impact of deworming interventions.

Two recent trials have shown that health education interventions can successfully modify risk behaviors in school-age children, thus reducing their risk of STH infection (6, 7). Results of these two trials are encouraging, but in both cases,

the health education intervention was delivered under the careful supervision of highly trained research personnel. Because such monitoring would not be feasible if health education interventions were scaled up to a national level, their long-term impact depends on sustained implementation in regularly conducted classrooms.

The objective of this cross-sectional study was to measure the extent to which a health education intervention was still being implemented at schools in the Peruvian Amazon, 2 years after the conclusion of one of the aforementioned trials (7).

In July 2012, we approached the directors of 18 primary schools in Belén (4)—an impoverished community in the Peruvian Amazon, highly endemic for STH infections—to participate in this cross-sectional study. Two years prior,

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in March–December 2010, these 18 schools had participated in a study whereby 5th grade teachers were trained on STH prevention and were taught interactive pedagogical activities (4). The directors were administered an oral questionnaire regarding their school's 5th grade health curriculum. Directors were also asked to provide a list of all 5th grade teachers currently employed at their school. These teachers were then approached and administered an oral questionnaire on the pedagogical methods, tools and activities they used to educate their students on STH transmission and prevention. Both the director's and the teacher's questionnaires had been pre-tested for content validity in 2 schools of a neighboring area. Directors and teachers provided signed informed consent. This study was approved by the Research Ethics Board of the McGill

University Health Centre in Montreal, Canada, and by the *Comité Institucional de Bioética of the Asociación Civil Impacta* in Lima, Peru.

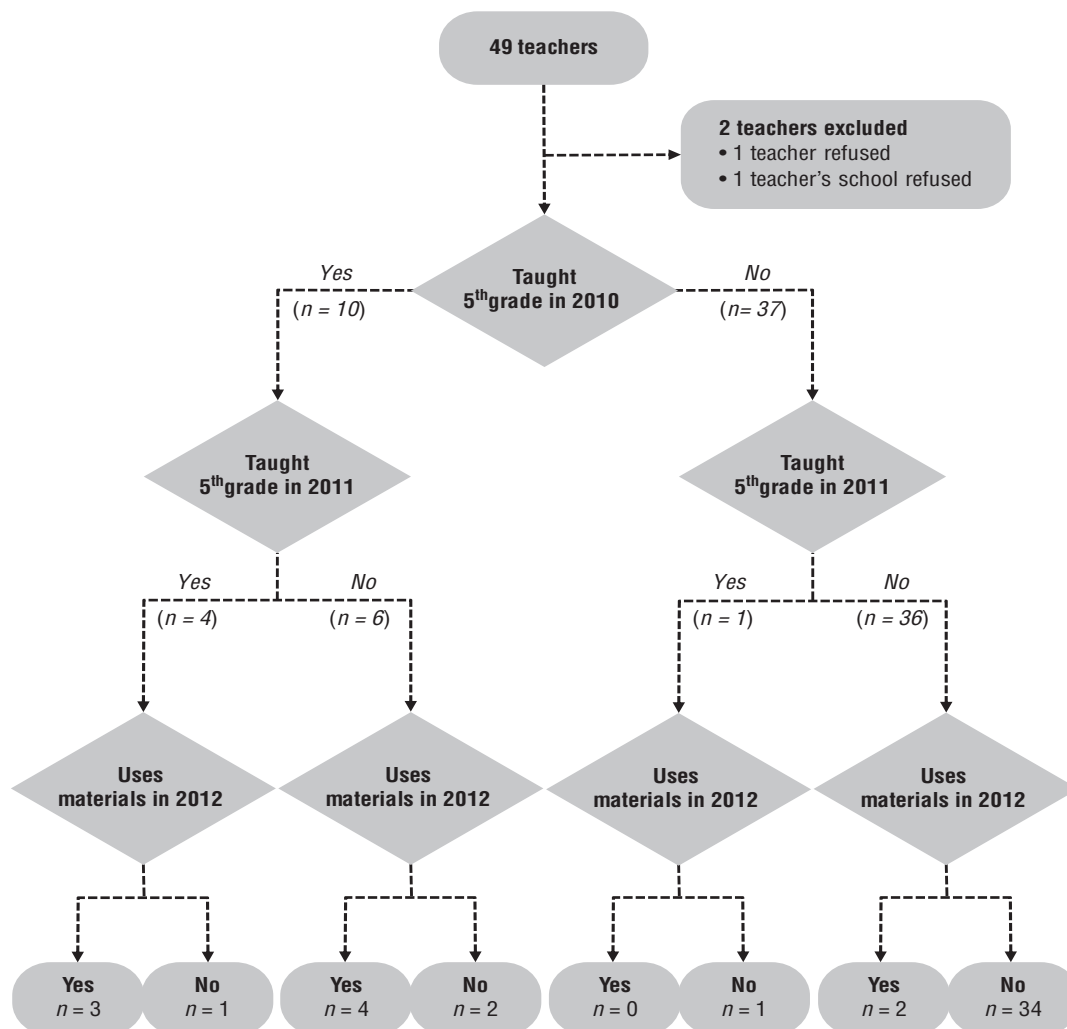
Of the 18 school directors, 17 (94.4%) consented to participate in this study. There were 48 teachers of 5th grade at the 17 participating schools, of whom 47 (97.9%) consented to participate in the study. Of these 47, only 10 (21.3%) had previously taught a 5th grade class during the March–December 2010 academic year when the health education intervention was originally introduced. Seven (70%) of these 10 teachers were currently adhering to the health hygiene education intervention. Only 2 (5.4%) of the 37 teachers who had not participated in the 2010 trial had incorporated the health hygiene education intervention in their 2012 classrooms. Therefore, after 2 years with neither monitoring nor

guidance from research personnel, only 9 (19.1%) of the 47 current 5th grade teachers were implementing the health education intervention (Figure 1).

The results of this cross-sectional study suggest that, once trained, the majority of schoolteachers will continue to implement an effective health education intervention in their (unsupervised) classrooms. This finding should encourage the use of a "train the teacher" approach to the implementation of health education components into school-based STH prevention and control programs.

The results also illustrate how teacher turnover can undermine the sustainability of health education interventions. Most untrained 5th grade teachers were not implementing the health education intervention, and many of them were unaware that pedagogical material on STH prevention

FIGURE 1. Current 5th grade teachers' use of health education materials that were previously introduced with a geohelminth intervention 2 years prior at 18 elementary schools, Belén, Peru, July 2012



had been provided to their school within the last 2 years. These findings are consistent with those of other studies conducted in resource-poor settings, where teacher turnover hindered the proper implementation of school-based health education interventions (8, 9).

To circumvent this barrier and to ensure the sustainability of health education interventions targeting behavior change in individuals, Swerissen and Crisp (10) argue that ongoing resources are required. In the case of health education components of STH-control programs, these ongoing resources could include annual training sessions of schoolteachers. Unfortunately, the resources required to provide annual training sessions to schoolteachers may not be available as part of large-scale STH-control programs in impoverished areas. Therefore, we believe that studies on novel approaches to sustaining health education interventions

(e.g., training teachers to train their successors) are urgently needed.

This study did have limitations that could affect the generalizability of its results. It should be noted that the participating 5th grade teachers self-reported teaching practices and use of pedagogical material in their classrooms; the teachers' level of adherence to the intervention was therefore inferred, rather than observed. Social desirability bias might have strongly influenced the self-reported teaching methods of teachers who had been trained in STH prevention in 2010, but might have only had a small impact on the self-reports of those who were not trained or aware of the intervention.

In conclusion, health education interventions are effective components of school-based STH-control programs, but teacher turnover decreases the sustainability of such interventions in resource-poor settings. Given that

pharmaceutical companies have recently pledged to donate 600 million tablets of deworming drugs every year through 2020 (and that school-based deworming programs are, consequently, now more affordable than ever), sustainable health education components to STH-control programs are urgently needed. Health education interventions cannot achieve their potential as powerful and cost-effective catalysts of sustainable STH prevention in school-age children if they are not continuously implemented in classrooms of STH-endemic areas where teacher turnover rates are very high.

Conflict of interests. None.

Disclaimer. Authors hold sole responsibility for the views expressed in the manuscript, which may not necessarily reflect the opinion or policy of the RPSP/PAJPH and/or PAHO.

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RESUMEN

Mantenimiento de una intervención de educación sobre prácticas de higiene para prevenir y controlar las geohelmintiasis en las escuelas de la Amazonia peruana

Palabras clave

Actualmente, la Organización Mundial de la Salud recomienda que los programas antihelmínticos en las escuelas incluyan como medida complementaria la educación sobre prácticas de higiene de salud. Sin embargo, aún no se habían evaluado la sostenibilidad y la repercusión a largo plazo de ese tipo de educación. En julio del 2012, se realizó este estudio transversal en 18 escuelas primarias de la Amazonia peruana para medir el mantenimiento de la adherencia a una intervención de educación sobre prácticas de higiene de salud, encaminada a reducir las helmintiasis transmitidas por el suelo que se habían introducido en las aulas durante los dos años anteriores. En gran parte como consecuencia de las elevadas tasas de recambio de profesorado, solo 9 de 47 profesores (19,1%) seguían llevando a cabo la intervención. Por consiguiente, las intervenciones de educación sobre prácticas de higiene de salud deben diseñarse de manera que garanticen una mayor sostenibilidad y contribuyan a la eficacia general de los programas de eliminación de parásitos en las escuelas.

Helmintiasis; educación en salud; salud del niño; Perú.