Monitoring & Evaluation Protocol: School Health Education Program

Summary

Primeros Pasos was established in 2002 as a primary care clinic serving residents of the Palajunoj Valley in western Guatemala. Since then, the clinic's operations have expanded to include outreach programs, including nutrition, dental, and school outreach programs. The school education outreach program is currently targeting four schools in Primeros Pasos' catchment area -- Tierra Colorada Alta, Candelaria, Bella Vista and Las Majadas. The curriculum, which is still undergoing development, targets children in kindergarten through sixth grade and covers a wide range of topics from nutrition and hygiene to puberty and drug addiction. A Primeros Pasos staff member visits each school monthly to deliver the curriculum.

Primeros Pasos currently needs an effective monitoring and evaluation framework to track their school outreach education program. Planned metrics include output metrics (number of education sessions, number of children in attendance) as well as outcome metrics (pre-test and post-test scores). In this protocol, we outline a monitoring and evaluation framework, elaborate on methods and a possible timeline, and provide a standardized monitoring and evaluation reporting tool. The goal of this protocol is to provide a clear, feasible plan so Primeros Pasos can monitor the outputs and outcomes of their school outreach program, both for further program development and for program funders.

Protocol Development

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Introduction

Background

Primeros Pasos is a not-for-profit clinic that was founded in the western highlands of Guatemala in 2002. Primeros Pasos serves indigenous families in the Palajunoj Valley and is located just outside Quetzaltenango, the second largest city in Guatemala. This region of Guatemala has particularly high rates of childhood stunting, sometimes reaching 70%, as well as other poor health outcomes (USAID 2018). The population that Primeros Pasos serves is primarily K'iche', an indigenous Mayan group that traditionally experiences worse health outcomes than non-indigenous Guatemalans (Cerón, A. et al 2016).

Although Primeros Pasos started primarily as a clinic, the organization's community outreach programs are an important part of overall operations. In 2005, Primeros Pasos started to provide age-appropriate health education in schools on topics ranging from nutrition and hygiene to personal identity and self-esteem through its education outreach program (Appendix D). This curriculum is age-specific and is meant to complement the education children receive when they are seen in clinic (Primeros Pasos 2010). Education sessions are interactive, incorporating demonstrations, songs and other age-appropriate activities. Primeros Pasos' Outreach Coordinator and volunteers travel to schools each month to deliver this curriculum. Previously, ten schools in the Palajunoj Valley were included; however, due to organizational restructuring in 2018, the education outreach program now targets four schools in Tierra Colorada Alta, Candelaria, Las Majadas and Bella Vista (Primeros Pasos 2018).

The program targets core health needs, particularly nutrition, hygiene, and dental care. Childhood malnutrition is one of Guatemala's most prevalent and challenging problems. Almost 50% of Guatemalan children are stunted due to malnutrition, and this increases lifetime risk of high blood pressure, diabetes, and other non-communicable diseases (USAID 2018). Poor hygiene is another major contributor to stunting and childhood illness in Guatemala. Improving hygiene habits and infrastructure such as latrines and clean water supplies lessen the chances of water-borne and food-borne diseases. Additionally, the rates of diarrhea have been shown to be higher in families with the lowest levels of education, suggesting that hygiene and literacy may be closely related (Feachem, R G. 1984).

According to the WHO, 12 year old children in Guatemala have an average of 8.1 decayed, missing, and filled teeth (Antonarakis, G. 2011). There is a shortage of dental manpower, and funding for oral health is a low priority for national health authorities. Moreover, emergency oral care receives the most resources since patients generally only seek out care when prompted by pain. Poor living conditions, low education levels, lack of support, and poor access to clean water and sanitation facilities are all risk factors for oral diseases (Antonarakis, G. 2011). A focus on preventative dental care and oral hygiene education would be a major benefit to the health of the community.

Current education program competencies

I. Understand the important role that proper basic hygiene plays in leading a healthy lifestyle.
II. Apply skills learned in lessons to daily life.
III. Demonstrate knowledge of how healthy habits developed during adolescence affect a person's lifelong wellbeing.
IV. Develop an understanding of the ways in which the human body changes with age, and the important health concerns for each age.
V. Identify the ways in which we as humans impact the natural environment, and the ways in which the environment impacts human health.
VI. Explain the dangers of engaging in risky behaviors such as substance abuse and unprotected sex.
VII. Describe the importance of mental health to a person's overall health and well-being.
VIII. Gain the skill set necessary to schedule regular medical and dental appointments.
IX. Appreciate the integral role that a well-balanced diet plays in maintaining good health throughout the life course.
X. Recognize the impact that maintaining good dental health has on overall health.

Many of the child education components are mutually reinforcing. For example, knowledge and access to safe water and sanitation can lead to a greater ability to use new nutrition and dental hygiene skills, which will lead to a reduction in parasitic and oral diseases, which will improve the overall health of the children and communities. This health education program has the potential to greatly improve the health of the children involved if implemented adequately.

Justification of protocol

Primeros Pasos does not directly track outcomes of its school health education program and needs an effective monitoring and evaluation protocol. A monitoring and evaluation protocol would be useful for several reasons:

1. Outcomes data will be useful to Primeros Pasos when applying for grants or seeking other funding sources.
2. Outcomes data will allow Primeros Pasos to adapt its curriculum based on component efficacy.
3. Input, output, and outcomes data will allow Primeros Pasos to improve program efficiency by only including curricular components that lead to desired outcomes, which is especially important given Primeros Pasos' limited human and capital resources.
4. Individual level data may allow Primeros Pasos to more carefully target efforts toward children who are struggling.

The overall monitoring and evaluation framework focuses on tracking outputs (number of sessions) as well as short-term (child attendance) and mid-term (change from pre-test to post-test)

metrics, as this is the standard in literature. The framework includes age-specific pre-tests and post-tests tailored to the curriculum that each grade receives as well as developmental level.

Traditional paper-based pre- and post-tests are not appropriate for evaluating young children up to age 8. More appropriate evaluation methods include observational assessment of skills (i.e. hand hygiene) as well as one-on-one testing. Ideally, the child should know the test administrator, and testing sessions should be short due to young children's limited attention spans (Guddemi, M. P. 2003). Therefore, example pre- and post-tests and a scoring rubric for the kindergarten curriculum based on these principles are provided.

Since Primeros Pasos is a non-profit and relies on grants and donations, a reporting tool is included with the protocol. This tool will allow Primeros Pasos to keep track of number of education sessions, monthly attendance by school and age, and pre- and post-test scores by school and age. It will additionally allow Primeros Pasos to note the monthly budget for its school health education program as well as any challenges or recommendations for further improvement. This tool will be useful internally as Primeros Pasos updates and improves its programs, and it can also serve as a thorough but easily readable reporting tool for donors and grant organizations.

Aims of protocol

Objectives

This protocol's purpose is to:

1. Develop an updated monthly report for Primeros Pasos to efficiently quantify who is being reached by Educational Outreach Program at their Bella Vista, Candelaria, Las Majadas, and Tierra Colorada Alta locations.
2. Develop a monitoring and evaluation framework to assess how effective their educational services are toward increasing the knowledge of children of various ages especially in the topics such as nutrition, hygiene, diet, germs, parasites, and sexual health.
3. Establish a baseline level of data on if and how children in the Bella Vista, Candelaria, Las Majadas, and Tierra Colorada Alta locations are learning the material and skills being taught so Primeros Pasos will be able to adjust their curriculum and teaching methodology in pursuit of better educational outcomes in upcoming years.

Research questions

The research questions associated with this protocol include:

1. Among students enrolled in the course, how effectively is the Education Outreach Program's curriculum increasing the health knowledge of students in different thematic areas?
2. Among students enrolled in the course, what are the health-related, material needs hindering them from accomplishing proper health behaviors?

3. How do pre-test to post-test changes vary between grade levels and between school locations? What curriculum and teaching style adjustments would need to be made to ensure the utmost health-related knowledge increase at all locations and age groups?

Methods

Study population

The study population consists of kindergarten through sixth grade students enrolled in Primeros Pasos Educational Outreach Program at the Bella Vista, Candelaria, Las Majadas, and Tierra Colorada Alta locations. All children with parental consent and child assent to participate in the pre-test and post-test evaluation will be included in the study sample.

Explanation of survey tools

The data collection method consists of pre- and post-tests gauging growth in student health knowledge through Primeros Pasos's Education Outreach Program. The pre-tests also include needs assessment questions, such as whether students have access to soap, clean water, and dental hygiene supplies at home. The pre- and post-tests (example of the Kindergarten pre- and post-test in Appendix A) are accompanied by a grading rubric (Appendix B).

The updated Monthly Report (Appendix C) consists of sections for tracking budgeting, student demographics, attendance, as well as pre- and post-test score averages per topic and per grade. Our current monitoring and evaluation report does not track responses to needs assessment questions, so this data will need to be stored separately from monitoring and evaluation data.

Pre-test administration

At the beginning of the school year prior to beginning the Education Outreach curriculum, Primeros Pasos staff will administer pre-tests for all students with parental consent and child assent. Evaluations will be conducted one-on-one in target schools by Primeros Pasos staff or volunteers who are fluent in Spanish. Pre-tests include skills evaluations as well as knowledge questions and needs assessment questions. These tests differ by grade since each grade has a unique curriculum. Tests will be administered orally for students in third grade and below and in written form for students in fourth grade and above.

Staff administering exams should ask questions directly and should not prompt students for specific answers unless directed to do so by the scoring rubric. Staff should follow the rubric when evaluating skills (i.e. hand hygiene, dental hygiene) and should not prompt students to complete specific steps in this task. Rather, they should note whether students remember to complete these steps on their own.

If a student is absent when the pre-test is administered for his or her class, staff should ensure that the student takes the pre-test before exposure to any health education lessons.

Post-test administration

Primeros Pasos staff will administer post-tests every 3-4 months following the pre-test. Post-tests include skills evaluations and knowledge questions but not needs assessment questions. Tests will be administered orally for students in third grade and below and in written form for students in fourth grade and above. To ensure that post-test scores are an accurate representation of long-term learning, post-tests will be administered separately from health education lessons. If staff need to administer post-tests on the same day as health education lessons in order to maximize efficiency, tests will be administered prior to the lesson to avoid priming effects on post-test scores. The final post-test should be completed on a separate day at least one week following the final health education lesson of the school year.

Staff administering exams should ask questions directly and should not prompt students for specific answers unless directed to do so by the scoring rubric. Staff should follow the rubric when evaluating skills (i.e. hand hygiene, dental hygiene) and should not prompt students to complete specific steps in this task. Rather, they should note whether students remember to complete these steps on their own.

Data Management Plan

Data storage & protection

Pre- and post-tests (Appendix A) will be administered as written above, and collected by the Primeros Pasos outreach staff and volunteers. The outreach staff will ensure all paper tests are secured when travelling and return them to the clinic where they will be scored and imputed into the spreadsheets. The tests will be scored based on the corresponding rubric for each grade, and the scores will be imputed into the excel spreadsheet and stored in a secure place such as a hard-drive or Box account. Once the tests have been imputed they will be discarded. The Box accounts are password-protected and only staff and volunteers who are working with the outreach program or reporting will have access to the data. The spreadsheet includes pre- and post-test scores for each grade by thematic area. The tests will be identified with the student's name and identification number.

Data analysis

The tests are comprehensive, meaning they will include each thematic area discussed for that grade, but will be scored separated by thematic area (Appendix D). The rubric (Appendix B) provides information on how to grade each question. Each question is weighted with a certain amount of points and there is a total number of points for each thematic area.

We will aim to keep track of each student's name and ID, as to compare their pre- and post-tests individually. If this proves to be unfeasible, we will keep track of each test and only enter it once into the excel spreadsheet, with question marks as missing information. It is important to use question marks instead of leaving the missing information blank, as excel will assume a blank cell is a zero and therefore misrepresent the results. We will discard the hard copy of the test once the information is imputed. This method will still be useful for average data analysis.

To calculate the difference, or gain score, we will subtract the pre-test score from the post-test score. We will do this on an individual basis, assuming we have pre- and post-tests available for all individuals, and at an aggregate level for each thematic area in each grade. We also have the schools listed on the spreadsheet if we need to separate by community in the future. The age and gender of the students are collected on the pre- and post-tests and will also be imputed into the spreadsheet. These will also be imputed into the reporting tool to see the demographics of the children that are being reached.

Dissemination plan

This protocol includes a reporting tool that can be shared. This tool is user-friendly and easy to complete once data has been collected. Monthly reports of attendance and trimester reports of pre-post test scores will be used internally to monitor and improve program efficacy and uptake. These reports will also be shared with participating schools, where they can be disseminated to teachers. Trimester and annual reports will be compiled based on monthly data and can be used by Primeros Pasos internally as well as being shared with funders. The compiled annual data will be extracted and used in Primeros Pasos' Annual Report.

For the initial implementation of this monitoring and evaluation program, any data disseminated to schools will remain de-identified; however, if there are adequate resources to track and improve scores at the individual level, Primeros Pasos can consider sharing individual-level data with schools in the future. This will allow Primeros Pasos and schools to identify individuals who are struggling with the health curriculum and who may need additional interventions.

Funding

This program will rely on funding from Primeros Pasos. The primary resource needed is staff time, both from the Outreach Coordinator as well as from volunteers. If post-tests are administered on a day in which a lesson was not provided, additional transportation costs will need to be covered as well. Materials include paper for pre- and post-tests and pens or pencils. For assessment of dental

hygiene and tooth-brushing skills, toothbrushes and toothpaste will need to be provided to each child as well. Although this framework does require additional human and material resources, this is justifiable because data will be used to attract further donations and to make programs more efficient and effective over time.

Although this protocol relies on Primeros Pasos staff to collect data, another possibility in the long term is enlisting local teachers to collect data on their students. While this would incur initial training costs, it may prove to be a more effective and efficient method of data collection given limited and fluctuating staff capacity at Primeros Pasos.

Benefits and limitations

A limitation in this data analysis is that it does not take extraneous factors into consideration. We cannot know for sure that the increase of scores can be attributed only to the health education outreach program. Students could be exposed to additional information in the time between tests. For example, if a child shared what they are learning with their parents at home, the family might seek out additional information from sources other than the health education intervention at schools. There also could be a testing effect where the children show improvement on the post-test because they remember taking the pre-test which has the same questions. Additionally, with some of the older children in particular, the pre-test may increase awareness of the topics and enhance participation in the program activities which may skew the results from the children who were not tested prior to the intervention.

Despite the limitations associated with this pre- and post-test design discussed above, it has proven to be effective in similar interventions (Black, M. 2004). Pre-testing alone can show what the population already knows about the subject, which can help inform the curriculum. The gain scores we will accumulate after post-testing will be an effective way to exhibit the growth of knowledge that will come from this education program. The scores will be easily understood by Primeros Pasos staff, families, funders, and the community, enabling the program to grow and show it's worth.

Ethical considerations

The protocol and associated parent consent and child assent forms will be evaluated by an appropriate IRB as determined by Primeros Pasos. Parent consent and child assent forms should be developed with Guatemalan staff to ensure that they are culturally appropriate and understandable by participants with low literacy levels. For parents and children who are unable to read or sign the form due to literacy challenges, staff will read the consent to participants and ask them to mark the form with an "X" to denote their consent/assent, and the staff member will sign the form as a witness.

Individual-level data (pre- and post-tests, scoring sheets) will only be accessed by direct program staff and volunteers with appropriate privacy training. Data will be stored in a secure way as outlined in the Data Management Plan. De-identified data will be shared with other staff members and schools in a timely manner as outlined in the Dissemination Plan.

Risks to participants in this protocol are minimal. Children may experience minor distress around pre-test and post-test evaluations, and staff and teachers should attempt to minimize this distress as much as possible. We anticipate that any additional work caused by this monitoring and evaluation protocol will be offset by the benefits of generating high-quality data on program efficacy. Data should be used to drive program improvement and growth over time.

Further steps

In this protocol, we outlined a monitoring and evaluation framework and created a reporting tool for Primeros Pasos' school health education program. We additionally developed an example pre-test and post-test with a scoring rubric to assess kindergarten students. Going forward, pre- and post-tests need to be developed for each additional age group, keeping age-appropriate evaluation in mind. Especially for students below third grade, any assessments must take developmental stage into account. For students in third grade and above, evaluation of intentions and behaviors may be a more appropriate metric than change in knowledge. We recommend use of the SNAP-Ed Framework developed by the UNC Center for Health Promotion, which assesses readiness and capacity for health behavior change, behavior change over time, and behavior maintenance (UNC 2016).

Any resources we have created need to be translated into Spanish for staff and client use. We additionally recognize that some of our evaluation tools may not be fully culturally competent or organizationally feasible, so we plan to revise our protocol and other materials as necessary with further input from Primeros Pasos.

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Appendix A
Parvulos (Kindergarten) Pre/Post test

Name: __________________ **ID#**________________ **Gender**: M / F **Age**:_________

School:_______________ **Grade and Section:**_________________ **Fecha**:_______

This interview took place ▯ Before **the charlas and lectures**
▯ After

1. **How many times a day should you brush your teeth?**

2. **Show me how you brush your teeth.**

3. **When should you wash your hands with soap?**
    a. Before preparing food (Y/N)
    b. Before eating
    c. After using the bathroom
    d. After touching animals
    e. After playing
    f. After touching something dirty
    g. Never

4. **What items do you need to wash your hands?**

5. **Show me how you wash your hands.**

6. **Which of these two foods are healthier?**

Needs Assessment Questions (asked during pre-testing only)

1. **Do you always have a toothbrush at home?**
    a. Yes
    b. No
    c. Sometimes
    d. I don't know

2. **Do you have dental floss at home?**
    a. Yes
    b. No
    c. I don't know

3. **Do you usually have soap in your house?**
    a. Yes
    b. No
    c. I don’t know

4. **Is there always water available in your school?**
    a. Yes
    b. Sometimes there is water
    c. No
    d. I don’t know

5. **Is there soap to wash your hands in your class?**
    a. Yes
    b. Sometimes there is soap
    c. No
    d. I don’t know

6. **How often do you shower?**
    a. Once a week
    b. Twice a week
    c. 3 to 5 days a week
    d. Daily or almost daily
    e. Never

Appendix B
Pre/Post test Grading Rubric
Parvulos

- **Dental:**
  1. **How many times a day should you brush your teeth?**
     1 point for correct answer
  2. **Show me how you brush your teeth.**
     Did the student use toothpaste? 1 point
     Did the student use a toothbrush? 1 point
     Did the student use water? 1 point

     Total: 4 points possible

- **Hygiene/germs**
  3. **When should you wash your hands with soap?**
     a. Before preparing food (Y/N) 1 point
     b. Before eating 1 point
     c. After using the bathroom 1 point
     d. After touching animals 1 point
     e. After playing 1 point
     f. After touching something dirty 1 point
     g. Never
  4. **What items do you need to wash your hands?**
     Hot water 1 point
     Soap 1 point
  5. **Show me how you wash your hands.**
     Did the student use warm water? 1 point
     Did the student use soap? 1 point

     Total: 10 points possible

- **Nutrition**
  6. **Which of these two foods are healthier?**
     1st pair - 1 point
     2nd pair - 1 point
     3rd pair - 1 point
     4th pair - 1 point
     5th pair - 1 point
     6th pair - 1 point

     Total: 6 points possible

Appendix C
Scoring and Reporting Tools

Link to test scoring spreadsheet
The test scoring spreadsheet tracks pre- and post-test scores for each subject area along with student name, ID, and age.

Link to reporting tool
The reporting tool tracks attendance and output data, program budget, challenges, and recommendations for change on a monthly basis. Pre- and post-test scores as well as change in score are tracked by trimester. Data from trimester reports is compiled into a final annual program report.

Appendix D

Kindergarten	**First Grade**	**Second grade**	**Third grade**	**Fourth grade**	**Fifth/sixth grade**
Nutrition Hygiene/germs Teeth	Nutrition Hygiene/germs Teeth Parasites	Nutrition Hygiene/germs Teeth Parasites Values	Nutrition Hygiene/germs Teeth Parasites Medical information Environment Children's rights	Nutrition Hygiene/germs Teeth Parasites Medical information Personal identity Delinquency	Nutrition Hygiene/germs Teeth Parasites Medical information Puberty Drug addiction Self-esteem Sex education

Topics covered by the school health education outreach curriculum for each grade.