

Assessing Early Childhood Nutritional Practices in Rural Uganda

Vicky Cheng^a, BSc, MSc; Erin Charman^a; Caitlin Pastorek^a, BSc; Trevor Hedges^a, BSc; Videsh Kapoor^{a,b}, MD

^aUBC Faculty of Medicine

^bDepartment of Family Medicine, Faculty of Medicine, University of British Columbia

ABSTRACT

OBJECTIVE:

According to the 2011 Uganda Nutrition Action Plan, 40 per cent of children under the age of five are malnourished. As local healthcare leaders identify childhood malnutrition as an ongoing problem in the rural village of Nakaseke, Uganda, this study aimed to assess early childhood nutritional practices in Nakaseke, and to identify barriers to healthy nutritional practices in order to create sustainable interventions.

METHODS:

Data was collected using seven focus groups with a total of 46 participants including community health workers, village health teams, and community members. The interviews were conducted in Luganda using a translator, and were audio recorded, transcribed, and analyzed for common themes.

RESULTS:

General poverty and lack of knowledge were identified as two major barriers to healthy nutritional practices in the community. Poverty left many homes unable to afford certain nutrition-rich foods, an issue compounded by the lack of family planning resulting in large families. A general lack of knowledge contributed to the inappropriate cessation of breastfeeding and the improper introduction of complementary foods, and was due in part to a lack of proper education.

CONCLUSION:

This study identified a continued need for education on nutrition within the community. With a better understanding of current practices and beliefs, we can now collaborate with the community to create sustainable interventions to address their specific needs while taking into account their financial restraints.

KEYWORDS: *global health, nutrition, health, illiteracy, community-based education*

INTRODUCTION

In Uganda, early childhood malnutrition rates have been estimated at 40 per cent of children under five years of age,¹ and are attributed to high rates of malaria, improper infant feeding practices, food insecurity, and lack of access to health care.² Although previous studies have examined nutritional practices in Uganda as a whole, data specific to rural communities are limited.¹ The causes of malnutrition are known to be multifactorial, including a significant socioeconomic influence. Dietary imbalance is a common problem, with Ugandan diets consisting mainly of starches and an inadequate intake of micronutrients, fats, and proteins.³ Additionally, food insecurity is an ongoing problem, affected by the history of civil war and ongoing civil unrest, as well as by high rates of poverty.^{3,4} Finally, education has been shown to be of particular importance in improving nutritional practices.⁴

Over the past four years, the UBC Global Health Initiative (GHI) has been working with the African Community Center for

Social Sustainability (ACCESS) in Uganda. ACCESS is a locally-based organization in the small village of Nakaseke that runs a health clinic and community-based projects. In the Nakaseke district, 55 per cent of people live below the poverty line, roads are not maintained, and access to amenities such as electricity and medical care are poor.⁵ Strikingly, about 15 per cent of children in the Nakaseke district are orphaned.⁵ ACCESS focuses on sustainably supporting the local community by providing medical care and education, encouraging economic empowerment, and training Community Health Workers (CHWs).⁵ CHWs roles include providing guidance when dealing with disease, and following up with vulnerable patients in conjunction with the medical center at ACCESS.⁵ The community also has Village Health Teams (VHTs), who are government based liaisons between community members and the medical system.⁶ Because there is a low doctor-to-patient ratio in rural Uganda, CHWs and VHTs are vital to the health care system.

Each summer, UBC GHI has sent a group of four students to assist with the program by providing education, performing research, and targeting areas for improvement. The 2012 GHI team identified a strong prevalence of early childhood malnutrition, particularly

Correspondence

vicky.cheng@alumni.ubc.ca

anemia and growth stunting.⁷ The 2013 GHI team arrived with the goal of assessing early childhood nutritional practices in the Nakaseke community. This qualitative study aimed to identify the current practices and barriers facing families and children in Nakaseke District, with the goal of preparing more efficient interventions for early childhood nutrition.

MATERIALS AND METHODS

Recruitment of participants

Research ethics approval was obtained from the UBC Behavioral Research Ethics Board (H13-00534). Participants were contacted by the ACCESS medical officer from a list of current CHWs, VHTs, and nursing aide students in the community. Community members who had recently attended the ACCESS medical clinic were also asked to participate. Consent was explained orally to the participants and translated into Luganda. All participants were given consent forms to sign if they wished to participate in the focus groups. Participants were served lunch and invited to take part in a seminar on early childhood nutrition following the focus groups. Participants were allowed to leave at any time without consequence and were still invited to attend the nutrition seminar.

Demographics of participants

The focus groups included a total of 46 participants including mothers, fathers, and participants without children (Table 1). The majority of participants had children, ranging from no children up to fifteen children.

Table 1. Participant demographics

Females (%)	78
Males (%)	22
Age range (years)	20 to 58
Average age	37
Participants with children (%)	89

Focus groups

Seven focus groups were run in Nakaseke, with each focus group including between five and nine people. The focus groups were conducted over a period of three days in the teaching building at ACCESS Uganda's LifeCare Center. There were three cohorts of research participants: 1) CHWs and nursing aide students (henceforth referred to as CHWs) 2) VHTs and 3) community members. Each cohort was sampled individually, grouping those with similar training backgrounds together to avoid influencing the responses given. Within each cohort, participants were placed into focus groups based on arrival time. All sessions were audio recorded with each session lasting between 60 and 90 minutes. Questions and answers were translated orally between English and Luganda, phrase-by-phrase by a translator during the focus group sessions. Each focus group was run by two UBC medical students; one student guided with questions while the other student observed and recorded any non-verbal cues and behaviours. These UBC medical students had previously met the cohort of CHWs while holding health education seminars, but had not previously met the VHTs or community members. A list of standardized questions was adapted from the USAID Knowledge,

Practices and Coverage Survey specific to childhood nutrition.⁸ Questions were chosen to determine whether the World Health Organization (WHO) guidelines for infant and young child feeding were being met by community members.⁹ These questions were used to guide the focus groups in a semi-structured format, with additional questions added by the student leading the session as required for clarification and expansion on the answers given. The questions focused on breastfeeding, complementary feeding, and barriers to proper early childhood nutritional practices. The community members were asked about their personal practices and beliefs, while CHWs and VHTs were asked about both their own practices and beliefs as well as those witnessed within their community. The notes recorded by the second student consisted of details such as age, observations such as the visible comfort level of participants, and written summaries of the discussion. All audio recordings were later transcribed word-for-word by the researchers, with any unintelligible phrases entered as blanks and interpreted with the aid of written notes.

Data analysis

The organization of data and its thematic analysis was done by hand and was adapted from suggestions given by Onwuegbuzie et al. (2009).¹⁰ The transcripts were divided based on whether the response was about current practices and knowledge, or barriers faced in the community. Within these sections, ideas were grouped into themes, and each focus group was analyzed for the frequency with which the themes appeared. From there, each transcript was highlighted to show the frequency of these themes, and smaller themes were discovered and compared between the transcripts. Major themes were those that were mentioned in all of the focus groups. Minor themes were mentioned by some of the focus groups.

RESULTS

Demographics of participants Current early childhood nutritional practices and beliefs

Most CHWs and VHTs interviewed had received prior training on nutrition from other organizations such as World Vision. They were generally well informed on WHO recommendations, which consisted of exclusive breastfeeding to six months of age followed by introduction of complementary foods.⁹ Prior to having this knowledge, these participants had a wide range of practices, but adjusted their habits once they received education. Community members had some knowledge of recommended nutritional practices, but many were unsure if the knowledge they had was accurate:

You may find in the community only bananas, they only give their children bananas. They view that a child has to eat only bananas neglecting other food kinds so that they have to teach them how to balance the foods (CHWs)

All participants reported a wide range of personal nutritional practices, as well as practices they witnessed within the community. Complementary foods were introduced at a range of ages and the amounts and types of complementary foods also varied. Breastfeeding practices ranged from mothers not breastfeeding at all, to mothers breastfeeding exclusively for longer than the recommended duration of six months.^[9] Early cessation of breastfeeding was identified as

being multifactorial. It was reported that mothers who worked often had to leave their child at home. The fear of sagging breasts after breastfeeding was identified as a concern, particularly among young women in the community. The lack of breast milk experienced by some women was attributed to some women being less “gifted” (VHT) than others at producing breast milk. A common belief was that breastfeeding should be discontinued when a mother falls pregnant as it was believed to cause kwashiorkor in the child. With many families not using birth control methods, there are frequent pregnancies, and thus the discontinuation of breastfeeding in many children before the recommended age of two years.⁹ Other beliefs included cessation of breastfeeding during illness or if a mother is HIV positive.

Barriers

Lack of finances and lack of education were the two major themes that emerged from the focus groups. The focus groups clearly indicated that there is a large variance in the understanding of recommended nutritional practices among community members. Some members follow current WHO recommendations while others practice traditional beliefs and customs.⁹ There is some nutritional training given in hospitals during births, prenatal visits, and childhood immunizations. While this is a good step towards educating the community, it is not done consistently and not all mothers attend these sessions. Additionally, it is important to educate men in the community as well, because they are the primary decision makers and generally in control of the finances. Current programs do not target men, and any information sessions held at prenatal visits are not well attended by men. When health seminars are offered in the area, many community members are unable to attend due to transportation costs:

[T]here are many [community members who] know there is a seminar at Life Care [ACCESS]. They ask, “[are] there [reimbursements]?” If you say no, they hesitate. (CHW)

The need to work and care for their family prevents men from taking time away. As a result, a large part of the community remains uneducated.

Programs aimed at educating the community have suffered due to a lack of financial support. Programs involving the volunteer CHWs and VHTs have struggled due to financial and time constraints. The goal of these programs was to educate the CHWs and VHTs, allowing them to disseminate information in the community through seminars and house visits. Unfortunately, being volunteers, many CHWs and VHTs have to balance full-time work and personal responsibilities with health education. Lack of time and the cost associated with visiting families in the community have prevented these programs from reaching the entire community. Additionally, the level of training and knowledge varied between members of the health teams, was not standardized, and may have led to the reinforcement of common misbeliefs.

It was reported that there are also some community members who lack the interest and motivation to receive education. The community members that do attend seminars are typically the same people each time, which means there is a large percentage of the community that is either unable or unwilling to attend the seminars.

It was identified that some members of the community are “stubborn to change” their traditional ways. Many people who have multiple children see that their older child has grown up relatively problem-free and believe that their methods are good. Meanwhile their children may have been suffering from malnutrition that the parent did not recognize:

...[The community members] have a tendency of saying “I don’t have to bother with [changing nutritional practices], [this] older kid, he grew like that, he is in a good condition, why should I do that so don’t tell me about it.” (VHTs)

Even families that are well educated on recommended nutritional practices and are willing to change are not always able to carry out the recommendations. Inadequate finances was brought up in every focus group as a major barrier to healthy nutritional practices:

The family has all the required food that should be given to the baby, chicken because chicken lay eggs, they have milk, they have all kinds of stuff but because the family is so much focused on getting this money, instead of giving one egg to the kid, they give this egg to be sold to someone to get money. Instead of getting one cup of milk to the kid, someone sells this cup of milk to someone, then he gets money. (VHTs)

Meats, milk, fish, liver, and some vegetables are typically more expensive than starches such as matoke (a variety of starchy banana), maize flour, and cassava (yuca) (Table 2). Depending on the season, even staples such as matoke can become scarce and expensive. Additionally, a tradition of large families and a lack of family planning further stretches family resources.

DISCUSSION

The barriers in our research included difficulties with translation that may have led to the loss of subtlety in participant’s answers and understanding, limited representation of community members (especially those not already connected with ACCESS), and possible participant discomfort in sharing personal information during focus groups. Nevertheless, a lack of finances and education emerged as major themes within all focus groups. Financial instability was a major factor limiting access to education and access to nutritional foods. Thus, because of the challenge that financial barriers pose, it is important to focus on how to more effectively use available resources by improving education. A study in Western Uganda showed that educated mothers were more likely than uneducated mothers to prepare complementary food specifically for their infants.⁴ This points to the importance of education as a tool to improving nutritional practices in the community.

The current teaching methods that are being used for health education within the community follow the traditional classroom approach. This method appears to work well within secondary schools in the village of Nakaseke as it has been validated through research by previous UBC medical students; however, it is unknown if this is an effective method of education within the community as

Table 2. Current dietary practices of focus group participants

	Proteins	Fats	Carbohydrates	Fruits	Vegetables
Foods commonly eaten	<ul style="list-style-type: none"> • Beans • Crushed silver fish • Minced meat • Porridge • Ground nuts 	<ul style="list-style-type: none"> • Eggs • Margarine • Avocado 	<ul style="list-style-type: none"> • Sweet potatoes • Flour • Porridge • Cassava • Corn flour • Rice • Pumpkin 	<ul style="list-style-type: none"> • Bananas • Guava • Passion fruit • Jackfruit • Mangoes • Papaya • Pineapple 	<ul style="list-style-type: none"> • Greens • Tomatoes
Foods too expensive or unavailable	<ul style="list-style-type: none"> • Fish • Soy bean • Liver • Meat • Baby formula • Tinned baby food 	<ul style="list-style-type: none"> • Cow milk • Baby formula • Tinned baby food 	<ul style="list-style-type: none"> • Rice • Plantains • Potatoes • Baby formula • Tinned baby food 		

well.⁷ Traditionally, the community education sessions have been held in one central location and participants have been recruited from outlying areas. Long distances and a lack of viable transport makes it difficult for some individuals to attend. Members of the focus groups identified that only a small cohort of individuals regularly attend these educational seminars. Cultural barriers may also play a role in effectively disseminating knowledge, particularly into the more isolated regions of Nakaseke district. It is difficult to determine if the information is being relayed throughout the communities, and this is therefore an area for further investigation.

Future studies will address the need for early childhood nutritional education on a local level. In particular, we want to reach deeper into the community in order to target those community members who currently do not attend seminars, especially men. As suggested by focus group participants, traveling drummer groups could be used in order to present this information in a culturally appropriate way. These groups would present the information using story, song, and dance, incorporating local traditions as well as integrating culturally important beliefs. HIV and AIDS education was well received using this traditional style folk media in rural villages in Ghana.¹¹ Further modification of the presented nutritional seminar will help to better target identified issues and dispel common misbeliefs identified in the focus group sessions. It is important that these seminars promote the most affordable and accessible nutritional foods in order to help improve dietary imbalances. The modified nutrition seminar will continue to be taught to CHWs and VHTs in order to continue working towards sustainable education in the community. Our ACCESS partners are looking at ways to provide sustainable funding for these community-based education programs through future income-generating initiatives such as a planned nursing school.

In conclusion, the current nutritional practices in the village of Nakaseke are varied. The major barriers identified by the focus group participants were financial constraints and lack of education. Other minor barriers overlapped considerably with these two general themes. Future directions will target the current educational practices in Nakaseke. We will aim to reach this goal by improving the efficiency of education and reaching a larger part of the community. Sustainable funding generated through a new nursing school currently under construction will allow for continued outreach to the community for ongoing nutrition and health education. The overall aim of these

initiatives would be to improve early childhood nutrition and general community health.

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Evaluating Behavioural Change Among Eighth–Grade Youth Following a Global Health Workshop

Jennifer Carlisle^{a,b}, BSc; Joel Livingston^{a,b}, BSc, MSc; Philip Motyka^{a,b}, BHK; Mireille Potentier^{a,b}, BSc; Alia Dharamsi^{a,b}

^aUBC Faculty of Medicine

^bGlobal Health Workshop Development Team

ABSTRACT

OBJECTIVE:

Youth growing up in today’s globalized society will experience the impact of global issues more so than previous generations have. As such, educating students to be global citizens should be considered a priority in our society.

METHODS:

This pilot study used the Theory of Planned Behaviour, a model previously shown effective in evaluating changes in behaviour and intention in youth. This model was employed to evaluate the efficacy of a one–hour workshop in changing youths’ reading, talking, and watching behaviours when learning about global health.

RESULTS:

Data showed that a one-hour workshop changed talking behaviours with an absolute mean difference of 0.50 (95% CI 0.28 -0.72, *p*-value of <0.001), and watching behaviours with an absolute mean difference of 0.33 (95% CI 0.05-0.60, *p*-value of 0.02) in a sample of female eighth–grade students from a Vancouver private school. Reading behaviours were unchanged. According to the Theory of Planned Behaviour, changes in behaviour can be attributed to changes in youths’ subjective norm with a mean difference of 1.81 (95% CI 0.73-2.88, and a *p*-value of 0.001).

CONCLUSION:

A one–hour interactive workshop changed youths’ subjective norms when learning about global health issues that they care about. This may have led to behavioural changes, specifically watching and talking behaviours.

KEYWORDS: *global health, youth, planned behaviour*

INTRODUCTION

In today’s increasingly globalized world, the struggles of one nation can have far-reaching impact on individuals around the world.¹ It is therefore of great importance for the youth of today to grow up with an awareness of the world’s interconnectedness, as they stand to be impacted directly by global problems in the future. Knowledge of the problems facing the global community is what will ultimately allow youth to have a positive and meaningful impact in the world. Even those who are seemingly far-removed from these issues by geographical location or by socio-economic status may in the future have a large role in combating issues that affect nations far from their own. For example, those who are well-educated and able to afford travel can work or volunteer overseas as young adults, helping people in these countries. Many important global problems fall under

the category of global health, and the World Health Organization considers having access to the highest possible standard of health a fundamental human right.²

A key first step in understanding global health is to become aware of the notion and impact of health on populations and to become educated about its contributing factors. The term global health is used frequently in many settings; however, it is rarely defined.³ For our purposes, global health is defined as “those health issues that transcend national boundaries and governments and call for actions on the global forces that determine the health of people.”⁴ Though some would ascertain that there remains some ambiguity in the limitations and ramifications of the term global health, it is well-understood and appreciated that increased knowledge of global health has led to a surge of interest, with many global health initiatives established.⁵

To educate youth about global health, a one–hour interactive workshop on the topic was delivered to groups of eighth–grade students. Different modes of delivery were used, including a lecture component, an audience question period, and small group

Correspondence

j.livingston@alumni.ubc.ca

activities. Students were encouraged to share their ideas with the rest of the class throughout the workshop. The goal of our workshop was to challenge students to think about specific global health issues and to inspire them to learn more about the issues that they care about.

While secondary schools are excellent venues to educate youth on various topics, it is unclear whether delivering a workshop on global health will encourage students to become more informed about it by pursuing further education or research in the area. As to our knowledge, there have been no previous studies in this area. We designed and conducted a pilot study to address two goals. The first goal was to determine if the workshop changed youth attitudes towards learning about the global health issues that they care about through watching, reading and/or talking about global health. The second goal was to evaluate if the Theory of Planned Behaviour (TPB) was an appropriate model for designing a presentation and detecting a change in youth behaviour. We hope that our study will provide some preliminary information on educating youth about global health and measuring changes in behaviour after an intervention such as the one we implemented. We believe that there is a gap in the literature on this topic and we hope that our study will act as a catalyst for more research in this area.

MATERIALS AND METHODS

The workshop was one hour long, and it was presented to groups of grade eight female students at Crofton House secondary school in Vancouver, British Columbia. It was held during school hours. The workshop began with a lecture-style component that included asking the audience thought-provoking questions. The participants were encouraged to share their answers with the rest of their classmates. We introduced the concept of global health in general, focused on a few specific global health issues such as child mortality and clean drinking water, and presented the United Nations (UN) Millennium Development Goals (MDGs).^{6,9} Also included in the workshop were small group activities. The students were split into groups of five to six, and each group was given a card that contained pictures from a particular country that represented various global health issues present in that nation. The groups were then asked to brainstorm what sort of global health issues the citizens of that country may face. They were then asked to present their ideas to the rest of the class and to provide possible solutions to the issues. At the end of the workshop, students were given a resource handout (see Appendix 3, available online) with information about various global health resources.

To evaluate the impact of the workshop on youth attitudes towards learning about global health, a pre- and post-workshop questionnaire was conducted. We used the TPB to ground our analysis.¹⁰⁻¹² The TPB has been used in many studies to predict a variety of behaviours, such as smoking, sexual behaviour, exercise, and food choices.¹³⁻¹⁵ The TPB has been particularly useful in studies where the participants' intention to change a behaviour is unknown or may be low.¹⁴ This feature is relevant to our study, as we have no preliminary data about youths' intention to learn about global health.

To generate the questionnaire, constructs of the TPB were defined as detailed in Table 1 (see Appendix 1, available online). A minimum of three questions was devoted to evaluate each construct and a six-point grading scale was offered for each question's response (e.g., strongly disagree, disagree, slightly disagree, slightly agree, agree, strongly agree). For each construct, questions asked about a talking, a reading, and a watching behaviour. For some constructs, additional questions related to youths' general interest in global health or details of the construct. All participant answers were confidential to reduce the bias of peer influence.

Table 1. Participant demographics

Construct	Definition
Behaviour	Youth have acquired new knowledge about global health through reading, talking, and/or watching.
Behavioural Intention	Youth intend to acquire new information about global health through reading, talking, and/or watching.
Attitude toward behaviour	Youth feel they have a responsibility to keep up with information in global health through reading, talking, and/or watching.
Subjective norm	Youth believe their peers would approve of activities to stay informed about global health through reading, talking, and/or watching.
Perceived behaviour control	Youth know resources where they can find information about global health through reading, talking, and/or watching.

Usability of the questionnaire was evaluated via a group of six eighth-grade youth living in Vancouver who did not participate in the workshop. This volunteer group was recruited through community organizations, and subjects came from similar socioeconomic backgrounds to the full cohort. Results from the usability group demonstrated that participants were able to complete the questionnaire in ten minutes. Subjects also provided feedback on the clarity and appropriateness of the questions.

Inclusion criteria for the main study were any eighth-grade students who attended the global health workshop at Crofton House secondary school in Vancouver on February 21, 2013. While the workshop has been delivered to students in both public and private schools in Vancouver on multiple occasions, only students from Crofton House—a private school—were selected for this study. This school was chosen on the basis of a previously established relationship between the school and UBC medical students. While the study team recognizes this was not likely a representative sample of Vancouver youth (see discussion below), we felt that the opportunity to present to a large number of students ($n=100$) on single day would help to provide statistical power to our analysis and would control for temporal influences on study results.

Exclusion criteria were met if any student had previous exposure to the workshop (e.g., at a previous presentation at UBC or at another secondary school). Students were also excluded from the study if they did not agree to participate in the study or if their parent/legal guardian requested that they do not participate. Prior to subject recruitment, research ethics board approval for the study was obtained through the University of British Columbia.

The pre-workshop questionnaire was conducted just prior to the delivery of the workshop, and the follow-up post-workshop questionnaire was conducted two weeks later. Participants were asked to write a unique code on each questionnaire so that the pre- and post-workshop questionnaires could be matched, and so that confidentiality could be maintained. The questionnaires, along with the workshop, were conducted during students' regular class time.

Responses for each subject (both pre- and post-workshop questionnaires) were entered into a Microsoft Excel spreadsheet (Microsoft Corp., Redmond WA). Initially, results were tabulated to create a cumulative score for each TPB construct. A paired t-test analysis was conducted to assess pre-/post-workshop changes for each construct, and p-value of <0.05 was set as the threshold for significance. Sub-analyses were also conducted to evaluate changes in the individual components of behaviour (i.e., reading, talking, watching) using paired t-tests.

Paired t-test analyses were completed using STATA version 12.1 (Statacorp, College Station, TX). All other calculations were conducted using Microsoft Excel 2011 (Microsoft Corp., Redmond WA).

RESULTS

A total of 100 participants completed the pre-workshop questionnaire, and 83 participants completed both the pre- and post-workshop questionnaires. Results of the paired t-test analysis show a significant pre- and post-workshop difference in two TPB behavioural constructs: behaviour and subjective norm. [Table 2] For behaviour, the absolute mean difference (between pre- and post-) was 0.94 (95 % CI 0.42-1.46) with a p-value of <0.01. For subjective norm, the absolute mean difference was 1.81 (95 % CI 0.73-2.88), with a p-value of <0.01. No significant difference was noted in the other three TPB constructs as all p-values were >0.05.

Table 2. Paired t-test analysis of pre- and post-workshop questionnaires.

TPB Construct	Pre-/Post- Mean Difference (95 % CI)	P-value
Behaviour	0.94 (0.42-1.46)	0.0005
Behavioural intention	0.08 (-0.51-0.66)	0.7909
Attitude toward behaviour	0.75 (-0.21-1.72)	0.1247
Subjective norm	1.81 (0.73-2.88)	0.0012
Perceived behaviour control	0.34 (-1.08-1.76)	0.6375

After the initial analysis, a sub-analysis was conducted to look at individual components of behaviour.[Table 3] The results showed significant differences after the workshop in talking behaviour (absolute mean difference of 0.50; 95 % CI 0.28-0.72; p-value of <0.01) and watching behaviour (absolute mean difference of 0.33; 95 % CI 0.05-0.60; p-value of 0.02). There was no significant difference seen reading behaviour, as the p-value was >0.05.

Table 3. Paired t-test analysis of pre- and post-workshop questionnaires.

Behaviour Component	Pre-/Post- Mean Difference (95 % CI)	p-value
Talking	0.50 (0.28-0.72)	<0.0001
Reading	0.15 (-0.11-0.40)	0.2550
Watching	0.33 (0.05-0.60)	0.0192

DISCUSSION

The workshop was designed to change attitude, subjective norm, and perceived behavioural control of youth actively learning about the global health issues that they care about. As per the TPB, a youth's attitude, subjective norm, and perceived behavioural control all influence behavioural intention, which ultimately influences behaviour. The advantage of using the TPB in this study was that it allowed us to better understand the factors that can motivate changes in youths' behaviour.

Subjective Norm

According to our analyses using the TPB model, the effects of the workshop on changing behaviour were attributed completely to changes in subjective norm. A similar study that evaluated the effectiveness of a youth intervention promoting safe sex used the TPB. They found that changes in subjective norms had the greatest influence on behavioural changes.¹⁶ Another study using the TPB highlighted the importance of the intervention design and how interventions generally target a specific construct of the TPB rather than all the constructs.¹⁷ In the workshop on global health, a dominating part of the workshop was discussion among peers, which was likely why youths' subjective norms were predominantly affected after the workshop. It is possible that focusing the global health workshop on one specific construct would have been more appropriate for the length of the workshop and would have been even more effective in changing that one construct.

Attitude

In the current study, no significant change was observed in attitude towards learning about global health. This is similar to the results of a pre- and post-study evaluating a sexual health awareness program for Tanzanian youth, which found that while knowledge and behaviour were changed, attitudes were not.¹⁸ The authors concluded that the 45-minute educational intervention was effective in improving knowledge, but they found that attitude was more difficult to change. Our findings further support this conclusion. Perhaps to see a change in youths' attitude, a longitudinal workshop series over several weeks would be more effective. For example, in a 6-week study evaluating the effectiveness of a 1 % milk campaign, researchers found that changes in attitude had the greatest influence on behavioural changes.¹⁷

Perceived Behavioural Control

The influence of perceived behavioural control to affect changes in behaviours is quite varied.¹⁰ In the present study, no changes were detected in the perceived behavioural control after the

workshop. Blackwell hypothesized that the utility of changing perceived behavioural control increases when an intervention targets participants with more sociodemographic barriers.¹⁹ The current study population came predominantly from wealthy Vancouver families, who may have not had barriers to learning about global health issues. Youth from other socioeconomic backgrounds may have faced more barriers. Previous studies have found that the home environment is an important predictor of perceived educational barriers—for example that parental education, financial difficulties, and ethnicity all influenced perceived educational barriers in youth.²⁰

Behaviour & Intention

This study showed changes in youth behaviour after the workshop but no changes in their intention to learn about the global health issues they care about. While the questionnaire did have students list global health issues that they cared about, the workshop was not tailored to these issues. A meta-analysis of studies using the TPB found that in half of the studies, intention was affected, whereas in two-thirds of the studies, behaviour changed.²¹ In the current study's questionnaire, the pre-workshop intention scores were higher than the pre-workshop behaviour scores. According to the TPB, behavioural intention is required before a change in behaviour can occur. This may suggest that the study population already had the intention to learn more about the global health issues that they cared about, and this may have enabled the workshop to influence a change in behaviour. Future studies may explore the effectiveness of the workshop's ability to influence intention in study populations where the baseline intention to learn about global health is low. Also, a future study might involve surveying students a few weeks prior to the workshop, and allowing time for the workshop to be tailored to the global health issues that the students found most interesting. This could potentially produce a change in intention and a greater change in behaviour by targeting students' interests.

In a meta-analysis about the effectiveness of health promotions campaigns, it was found that the baseline rates were important indicators in predicting change.²² According to this analysis, it was easier to promote change in a population when the initial baseline rates were low. In our pre-workshop questionnaire scores, attitude and perceived control towards learning about global health issues both scored high while social norms scored lower. In congruence with the meta-analysis, social norm was the construct with the most change.

Evaluation of the Changes in Behaviour

This study found a change in behaviour in youth actively acquiring information about global health issues that they care about through reading, talking and watching behaviours. Changes were found in talking, 0.50 (95% CI 0.28-0.7,) and in watching, 0.33 (95% CI 0.05-0.60), but not in reading (*p-value* was >0.05). The fact that reading behaviour was unchanged may be explained by a shift in youth behaviour shown by a longitudinal study done in Iceland from old media such as books, radios, and newspapers, to new media, including television, internet, and mobile phones^{2,3} This is valuable, as it suggests that when trying to affect learning behaviours in youth, targeting

talking and watching behaviours may be of increased importance compared to reading behaviours, both in the context of global health and in a more general context.

“ A one-hour interactive workshop changed a cohort of eighth-grade girls' subjective norms towards learning about the global health issues that they care about. Using the TPB as a model to understand behavioural changes, the change in social norms may have led to behavioural changes in pursuing knowledge about the global health issues that concern them.

Limitations of the Study

There are several limitations to the study. Firstly, the results are not generalizable to all youth, as our study group consisted of only 83 eighth-grade girls attending a private school in a wealthy Vancouver neighbourhood. To be able to generalize the results, further studies need a larger sample size that includes both boys, as well as other socioeconomic groups. Also, while we did ask about whether or not students were born in Canada, we did not do an in-depth racial or cultural profile for our study population. This could be of value in a future study, as these backgrounds may influence students' perceptions of global health issues. Secondly, there is volunteer bias among our study group. Students were all given the option to participate in the pre- and post-workshop questionnaire components of the workshop. The workshop was delivered to 100 students, of which 83 completed both the pre- and post-workshop questionnaire. Volunteers may have been more interested in learning about global health and therefore more likely to independently learn about global health issues after the workshop. Thirdly, the post-workshop questionnaire was conducted only two weeks after the workshop. These results reflect immediate changes rather than long-term changes in behaviour. Lastly, the questionnaire used has not been validated by previous studies, and it may not be an accurate reflection of the youths' actual intentions, attitudes, perceived behavioural control, social norms, or behaviour.

Further Applications

These pilot study results can specifically guide the development of future presentations on global health for upper class eighth-grade girls. The results suggest that it is possible to change youths' behaviour towards learning about global health issues. The pilot study shows that further emphasis on influencing subjective norms in future presentations for this target audience would be the most effective means of influencing behaviour changes. Further, targeting talking and watching behaviours rather than reading behaviours would be more appropriate.

Using the TPB, we were able understand the changes in behaviour. It would also be beneficial to conduct the same questionnaire in a broader range of schools to identify both similarities and differences in the driving factors in behaviour change among different groups of youth. These results would enable future presentations to be tailored to different audiences. Different presentation formats could target the specific constructs of the TPB that are most likely to influence a behavioural change in that population.

Conclusion

A one-hour interactive workshop changed a cohort of eighth-grade girls' subjective norms towards learning about the global health issues that they care about. Using the TPB as a model to understand behavioural changes, the change in social norms may have led to behavioural changes in pursuing knowledge about the global health issues that concern them. The workshop had no effect on the girls' attitudes, perceived behavioural control, or intentions towards learning about global health issues. Specifically, watching and talking behaviours were changed after the workshop, reflecting youths' usage of newer medias.

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