

BACKGROUND

In 2001, Biblioteca Las Américas (BLA), a school library in the South Texas Independent School District (STISD), began the Vital Information for a Virtual Age (¡VIVA!) Peer Tutor Project, in which high school students promote MedlinePlus in their high schools and communities. MedlinePlus and its companion site, MedlinePlus en español, are consumer health information websites maintained by the National Library of Medicine (NLM) [1]. Approximately 80% of the STISD student population is Hispanic [2]. The district serves counties that are medically underserved [3] and have poverty rates that are double the national average [4].†

The ¡VIVA! Peer Tutor Project started as a partnership between the University of Texas Health Science Center at San Antonio (UTHSCSA) Libraries and BLA, when the former received funding from NLM to conduct health information outreach projects in the Texas Lower Rio Grande Valley [5]. Four high school students from the STISD's South Texas High School for Health Professions (Med High), with training and guidance from a UTHSCSA medical librarian, taught their peers and faculty members about MedlinePlus in the first year of the project. The project is now administered directly by BLA and has been extended to all four high schools in the district, which consists of two health careers high schools; a science and technology high school; and a business, education, and technology high school. NLM has supported the project for almost ten years, through funding either to STISD or UTHSCSA. The school district's administrators have strongly endorsed the project, and the BLA librarians have built a network of librarians and faculty who actively participate as mentors and advisors.

Details of the project and its evaluation were published in 2005 [6]. Peer tutors promote MedlinePlus to their peers and teachers through class demonstrations, student orientations, school health fairs, and extracurricular activities such as the Health Occupations Students of America meetings. Over the years, they have extended their reach to parents and the community through school open houses, local health fairs, fun runs, and motorcycle rallies. A popular outreach site for peer tutors is the Harlingen Boys and Girls Club, where they promote health information to children and teens.

The 2005 article published assessment results from a questionnaire completed by 500 Med High students in 2003, at the end of the project's first year. Results showed that 66% of respondents reported using MedlinePlus and 52% had referred the resource to others [6]. More recent evaluation data, described in ¡VIVA! subcontract reports, showed high awareness of MedlinePlus among STISD students. For example,

† Interactive tables were produced comparing US and Cameron, Hidalgo, and Willacy County poverty data using the US Census Bureau's Small Area Income and Poverty Estimates Program.

Long-term outcomes of the ¡VIVA! Peer Tutor Project: use of MedlinePlus by former peer tutors and the adults they taught*

**Cynthia Olney, PhD; Lucille Hansen, MLIS, MA;
Ann Vickman, MLIS; Sara Reibman, MLIS;
Frederick B. Wood, MBA, DBA; Elliot Siegel, PhD**

See end of article for authors' affiliations.

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Supplemental Table 2 and Appendixes A and B are available with the online version of this journal.

questionnaires administered to attendees at ¡VIVA! health careers fairs held in 2009 and 2010 (primarily students from the STISD's health careers high schools) found that 69% and 89%, respectively, knew about MedlinePlus [7, 8]. Attendee response rates for the 2009 and 2010 events were an estimated 69% and 50%, respectively.

Evaluation of the program's effect on the peer tutors themselves and on the school district has been ongoing and involves multiple methods—including focus groups, one-on-one interviews, and written assessments—to collect feedback from peer tutors, administrators, faculty, and librarians. In interviews, peer tutors consistently report using MedlinePlus to research their own and their families' health concerns. Interviews with administrators and teachers show they agree with the students.

Peer tutors and their teachers also report that the experience provides a unique learning opportunity, in which students develop not only health information literacy skills, but also self-confidence; public speaking ability; and interpersonal communication, teamwork, and project management skills [7, 8]. Administrators believe the project has enhanced the school district in a number of ways, including promoting student involvement in teaching, providing high-quality community service learning opportunities, and showcasing the special learning environment of the school district to the community [9].

After the project had been in existence for almost a decade, the core project team (the BLA librarians and the evaluation consultant) decided to assess long-term impacts of the project on peer tutors and those who received training from them. A growing body of research has focused on identifying the enduring effects of outreach efforts involving MedlinePlus [10–13]. In this case, the team wanted to know specifically if (a) former peer tutors continue to use and promote MedlinePlus, (b) educators involved in the ¡VIVA! Peer Tutor Project use and promote MedlinePlus, (c) family members of peer tutors and educators use MedlinePlus, and (d) former peer tutors perceive that the ¡VIVA! Peer Tutor Project helped them develop skills that were applicable to their personal and professional lives after high school.

METHODOLOGY

Questionnaires

Two versions of a questionnaire were developed. One questionnaire (Appendix A, online only) was designed for peer tutors who had graduated before 2009 (peer tutor "alumni" group). The second questionnaire (Appendix B, online only) was designed for faculty and administrators who had received training on MedlinePlus from peer tutors from the beginning of the program through 2009 (the educator group). Both versions had six identical questions related to respondents' current use of MedlinePlus (English or Spanish version), frequency of use, family members'

use of MedlinePlus, and respondents' continued promotion of the website to others. Respondents also were asked to provide examples of how they and others used MedlinePlus. The peer tutor version had additional questions asking respondents to rate how their experience in the project had contributed to the development of twelve skills, such as health information research, public speaking, and project management. The list of twelve skills was developed from project assessment data collected over the years.

Questions were modified from the questionnaire used in the 2005 article [6], versions of which have been used in other assessments conducted throughout the history of the program. Modifications to that study were necessary because it was designed for students and asked about their use of MedlinePlus for various high school and extracurricular projects. The peer tutor alumni version of the questionnaire was pilot-tested with three peer tutor alumni who had maintained close contact with BLA staff. The adult version was pilot-tested with two members of STISD staff who were not involved in the peer tutor project. The questionnaires were distributed using SurveyMonkey online survey software.

Participants

The peer tutor alumni version of the questionnaire was sent to all peer tutor alumni who had graduated between 2003 and 2008, assuring that all had been out of high school for at least one year. (The sampling frame would have included 2009 graduates, but no peer tutors graduated that year.) Library staff used Facebook and telephone calls to parents to get updated email addresses for the peer tutor alumni. The educator group version was distributed to the following twenty-three educators: teachers who had invited peer tutors to teach MedlinePlus in their classes or had some other type of involvement in the project, principals from the high schools that were participating in ¡VIVA! in 2009, and the district's superintendent and deputy superintendent.

RESULTS

Of the 45 emails sent to peer tutor alumni, 2 were returned as undeliverable. Of those who successfully received the electronic questionnaires, 30 (70%) responded. Twenty-two (73%) of the respondents had attended at least 1 of the intensive summer experiences (Summer Institutes) that BLA offers to peer tutors during summer break. This experience promotes bonding among the peer tutors and, arguably, engenders a stronger identification with the project. By comparison, 28 (62%) peer tutors who were sent the questionnaire had enrolled in Summer Institutes, so the respondent group had an overrepresentation of those who had more intensive engagement with the project.

Twenty (87%) faculty members and administrators completed the questionnaire (17 teachers and 3

Table 1
 ¡VIVA! peer tutor alumni and faculty/administrator self-reported use of MedlinePlus

	Peer tutor alumni (n=30)	Faculty/administrators (n=20)	Total (n=50)
Use of MedlinePlus in past six months	27 (90%)*	19 (95%)	46 (92%)
Used MedlinePlus 3+ times in past year	22 (73%)	13 (65%)	35 (70%)
Told others about MedlinePlus in past 6 months	20 (67%)	14 (70%)	34 (68%)
Other members of family use MedlinePlus	20 (67%)	15 (75%)	35 (70%)
Use of MedlinePlus en español in past 6 months	6 (20%)	3 (15%)	9 (18%)
Other members of family use MedlinePlus en español	7 (23%)	2 (10%)	9 (18%)

* Subgroup percentages should be interpreted with caution due to the low number of respondents.

administrators). Three respondents were employed in the community: a retired principal who was working for a community-based organization and 2 teachers who held second jobs in the health professions.

As Table 1 indicates, respondents reported high rates of usage of MedlinePlus. Forty-six (92%) of respondents in both groups reported using MedlinePlus in the 6 months prior to completing the questionnaire, and 35 (70%) used MedlinePlus 3 or more times per year. Thirty-four (68%) had told others about MedlinePlus within 6 months prior to taking the questionnaire. Respondents reported high usage of MedlinePlus among their family members as well, with 35 (70%) reporting family usage. MedlinePlus en español, on the other hand, was used by 9 (18%) participants, and 9 (18%) reported use of MedlinePlus en español by family members.

Twenty-three respondents wrote examples of how MedlinePlus had helped them or others. They reported using MedlinePlus to research health conditions, get information about medications, help friends and family members with health issues, and locate health services (e.g., specialists, clinics, equipment).

Several respondents reported using MedlinePlus in their professions. For example, one former peer tutor, now a hospital nurse, recommended MedlinePlus to patients and family members to supplement information they received from health care providers. Another used MedlinePlus in an English as a second language class for health professionals who used the website's Spanish-to-English conversion tool to work on their language skills. There also were reports of respondents' personal use of MedlinePlus. One respondent and her sister helped their seventy-eight-year-old mother research her medication regime and discovered duplicate medications were being prescribed.

Findings also showed that peer tutor alumni believed their peer tutor experience contributed to their development of lifelong skills (Table 2, online only). Twenty-nine (97%) of the peer tutor alumni said that the experience increased their skills in finding health information for themselves and others. Twenty-five (83%) to 29 (97%) said the experience increased their skills in 8 other areas, including public speaking, interpersonal communication, and team work. Twenty-four (80%) said the project enhanced their ability to use technology, and

18 (60%) said the project improved their writing skills.

DISCUSSION

The findings from this project indicated that the ¡VIVA! project had lasting impact on the use of health information by both peer tutors and educators involved in the project. The majority of respondents reported use of MedlinePlus to research health issues and said their families used the website as well. Respondents also continue to tell others about MedlinePlus, including those whom they meet through their professions.

The peer tutors showed higher rates of MedlinePlus usage compared to the Med High students from the study published in 2005, who were the first to receive training from peer tutors. In the earlier study, respondents reported much lower rates of MedlinePlus use for personal or family health concerns (35%) and fewer referred others to the resource (52%) [6]. (At that time, reported student use was more school related.) The participants in the current study also reported higher rates of MedlinePlus use than were reported in a health information outreach project targeting high school students' use of other NLM databases [10].

The long-term outcomes of the project are most likely influenced by three key factors: the highly motivated and academically driven students, the dedicated librarians and faculty, and the intensive learning experience offered through involvement in the peer tutor project. The faculty and administrators in this project also are not representative of other adult groups reached by peer tutors, because faculty have ongoing exposure to MedlinePlus through the ¡VIVA! project activities.

The project team chose not to assess current STISD students, as it did in 2005, because team members were interested in learning about long-term use among nonstudents. It was beyond the scope and resources of the ¡VIVA! Peer Tutor Project to assess usage among STISD graduates who had received peer tutor training while in high school or community populations who were the beneficiaries of peer tutor training but did not receive the extensive experience of the respondents in this project. However, some positive outcomes in the broader population are emerging from a cross-sectional study that looked at predictors of health literacy

among current high school students. Findings indicated that exposure to MedlinePlus was associated with higher levels of health literacy [11]. One group of students in that study were from Med High, where the ¡VIVA! Peer Tutor Project was a major source of their exposure to MedlinePlus.

Peer tutor alumni also rated the peer tutor experience as an opportunity that helped them develop important lifelong skills, corroborating the feedback gathered annually through interviews with active peer tutors and educators. The learning aspect of the peer tutor project is important to all of the stakeholders. Students, school librarians, faculty, administrators, and supporters at NLM all understand that peer tutors who carry these life skills into adulthood will serve them, their professions, and their communities well.

CONCLUSION

This study demonstrated that a student-based health information outreach project like the ¡VIVA! Peer Tutor Project can have a lasting impact on the health information use of the students promoting information, their families, and others in their school community. It also can contribute to the lifelong learning of high school students trained as peer tutors. Anyone interested in starting a project similar to the ¡VIVA! Peer Tutor Project can find project information and materials on the ¡VIVA! website [14].

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AUTHORS' AFFILIATIONS

Cynthia A. Olney, PhD, olneyc@coevaluation.com, Evaluation Consultant, C.O. Evaluation Consulting, P.O. Box 767671, Roswell, GA, 30076; **Lucille Hansen, MLIS, MA**, lucy.hansen@stisd.net, Lead Librarian; **Ann Vickman, MLIS**, ann.vickman@stisd.net, Librarian; **Sara Reibman, MLIS**, sara.reibman@stisd.net, Librarian; South Texas Independent School District, 100 Med High Drive, Mercedes, TX 78570; **Frederick B. Wood, MBA, DBA**, fredwood@mail.nih.gov, Computer Scientist, Office of Health Information Programs Development, National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894; **Elliot Siegel, PhD**, siegel@nlm.nih.gov, Outreach Consultant, National Library of Medicine, Bethesda, MD 20894, and Principal, Elliot Siegel Consulting, P.O. Box 3095, Bluffton, SC 29910

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