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Cultural and Linguistic Adaptation of Stop the Bleed: Saving Lives in a Multi-ethnic Refugee Resettlement Community

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RESEARCH ARTICLE

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Cultural and linguistic adaptation of stop the bleed: saving lives in a multi-ethnic refugee resettlement community

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ABSTRACT

Background: Research and practice show an urgent need for health interventions to be adapted in culturally and linguistically responsive ways for limited English proficient (LEP) communities where cultural and language discordance exacerbate challenges in accessing healthcare. *Stop the Bleed (STB),* an evidence-based life-saving bleeding control intervention training for lay community members is available in English and Spanish and does not reach members of other culturally and linguistically diverse US communities.

Aims: Our aim was to culturally and linguistically adapt *STB* materials and training to serve six language communities (Arabic, Burmese, Dari, Pashto, Somali, Swahili) in a two-phase project by following health literacy (HL) guidelines and Culturally and Linguistically Appropriate Services (CLAS) standards in materials development and training implementation.

Methods: Using a convenience and snowball sample of community residents contacted through face-to-face conversations and a flyer, a semi-structured focus group of eight participants with interpreters and two interviews were held to understand emergency medical services, emergency healthcare in home countries, and interest in *STB* training. The focus groups and interviews were completed before materials adaptation. Materials were adapted using focus guide/interview data and HL guidelines and shared with members of the targeted language groups to ensure cultural and linguistic responsiveness and understanding of terminology. Community members were recruited for a *STB* training through face-to-face and in-language flyers. *STB* training was delivered by certified instructors with interpreters.

Results: A total of 144 community members were trained over a two-year period. In the first phase (n = 46) we assessed knowledge and self-efficacy pre- and post-training; results indicate that there was a statistically significant increase in knowledge about life saving techniques and a significant increase in self-efficacy to use STB. Qualitative survey results indicated that in-language training was critical for skills improvement and appreciated by attendees. In the second phase (n = 98), we trained community and business leaders of a local elementary school and resettlement agency who live among and serve the broad refugee community in Clarkston.

Discussion: Culturally and linguistically responsive adaptations of health-related materials and training that follow HL and CLAS guidelines must include community members' perspectives, cultural knowledge, and linguistic expertise. Adapted *STB is* a low cost feasible way to disseminate life-saving bleeding intervention training to diverse LEP communities.

PLAIN LANGUAGE SUMMARY

We adapted Stop the Bleed materials and training to incorporate cultural experiences, context, and language for community members from six different language groups. Materials revisions included ensuring written content was culturally sensitive and linguistically accurate and images were clear and meaningful; in-person training included having interpreter support during both didactic group training and individual hands-on training sessions. Culturally and linguistically adapting Stop the Bleed, a life-saving bleeding control technique that lay people can use to save lives, allowed us to train 144 people in Arabic, Burmese, Dari, Pashto, Somali and Swahili. Focus group and individual collaboration with community members for pre-materials development and iterative materials review allowed us to create meaningful materials using health literacy guidelines and following Culturally and Linguistically

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Appropriate Services (CLAS) standards. Providing in-language health information and training to communities where language is a key barrier to accessing preventive and emergency healthcare improves health equity for people with limited English proficiency.

Introduction

The US has seen more than 600 mass shootings in 2023; not a single week that year passed without at least one mass shooting. Metro Atlanta is ranked 3rd for the largest homicide rate increase in the US during COVID-19 (McCann, 2022). The escalation of trauma in the metro Atlanta area includes refugee, immigrant, and migrant communities along with other populations who are poor and underserved and who face steep barriers to accessing healthcare due to language discordance. Over 25,000 households in metro Atlanta's two largest counties report having limited English proficiency; 19 zip codes in these counties have more residents than average who have limited English speaking skills (Commonwealth Fund, 2021; Grady Health Systems, 2019).

.Gunshot wounds are complex, violent, and traumatic, and can involve significant bleeding. There are also many other traumatic injuries that can lead to significant and/or fatal bleeding such as motor vehicle accidents, occupational injuries, or falls. There are, however, simple bleeding control techniques that can be applied by anyone who is trained in them to provide immediate care at the site of an accident. *Stop the Bleed (STB)* is a 90-minute course to train lay people in recommended response and bleeding control protocol that can save someone's life while awaiting first responders; over 3 million individuals have been trained in *STB* (STBHome Page, n.d.). STB training is available in the US in English and Spanish only.

Language and cultural issues contribute to health care inequities and negatively affect health care outcomes of vulnerable populations (Estrada & Messias, 2015). The ability to provide culturally and linguistically appropriate services is critical not only to individual health, but also to the ongoing public health of the nation as the US population continues to become more diverse. According to the Brookings Institute, 2020 census data show that the white population declined by a fraction of a percent while the Latino/Hispanic, Asian American and Black populations grew by 20%, 29% and 8.5%, respectively (Frey, 2020). The lack of culturally and linguistically responsive healthcare services is one of the more modifiable factors contributing to health inequities for minority populations (Lee, 2021). Language barriers cause delays and denials of necessary benefits and services, as well as less effective, ineffective, and incorrect benefits and services (Lee, 2021). Non-native English-speaking patients also perceive barriers to health care services at multiple points in the process of receiving services (Andrulis & Brach, 2007).

DeKalb and Fulton counties are the two of the largest counties in Georgia and are part of metropolitan Atlanta. These two counties have a combined documented and undocumented foreign-born population of 330,000; 37.4% report being an LEP household and 31.7% live at or below the 100% poverty line, both negative social determinants of health (SDOH) to accessing equitable healthcare (Migration Policy Institute, 2019; U.S. Census Bureau, 2022). While the overall social vulnerability index (SVI) for both counties is moderate to high (.6611 and .5268, respectively), census tracts within both counties with large refugee, immigrant, and migrant (RIM) populations have very high SVIs, ranging from .8965 to .9999 (Centers for Disease Control and Prevention, 2000). Approximately 38.5% of non-native English speakers in both counties are Spanish speaking (U.S. Census Bureau, 2022), however, DeKalb County is also home to the city of Clarkston, a multi-ethnic community where more than 60,000 refugees have settled since 2004 (Moody, 2021; U.S. Census Bureau, 2022). Currently, half of Clarkston's 14,000 residents are foreign-born refugees who speak more than 60 languages and dialects including Amharic, Arabic, Burmese, Dari, Karen, Nepali, Pashto, Somali, Swahili, and Tigrinya (Moody, 2021). With the goal of improving access to health care among linguistic and cultural minority populations, the Office of Minority Health (OMH) at the U.S. Department of Health and Human Services (HHS) published the National Standards for Culturally and Linguistically Appropriate Services (CLAS) in Health and Health Care in 2000, becoming the first federal agency to operationalize and advance the concept (Lee, 2021). The HHS OMH released the enhanced National CLAS Standards in 2013, which outline 14 action steps that address continuous quality improvement efforts to advance health equity, improve quality, and reduce health care disparities (United States, Office of Minority Health, 2013). The action steps assist healthcare organizations in meeting the "Principal Standard" to provide effective, equitable, respectful, and understandable

quality care and services and respond to diverse cultural health beliefs and practices, health literacy, preferred languages, and other communication needs (Barksdale et al., 2017). Further, the National CLAS Standards can be applied across various health care contexts (Barksdale et al., 2017). CLAS standards are part of providing health literate healthcare services by improving people's ability to understand health information in their own language and through their own cultural lens. Although CLAS standards are increasingly being applied in different health care settings, they have not been widely incorporated into layperson health training.

Life supporting first aid (LSFA) entails the immediate implementation of crucial measures to save a life. Bystanders are an integral part of the "chain of survival," administering basic lifesaving procedures such as cardiopulmonary resuscitation (CPR) or external hemorrhage control while waiting for the Emergency Medical Services teams to arrive. In fact, a patient's chance of survival is two to three times higher with the implementation of bystander basic life saving measures (Stella et al., 2020). LSFA programs at the community level should address essential issues such as what to teach, methods of teaching, and motivation to both acquire skills and act in case of an emergency. LFSA training such as CPR and STB is available in limited languages (Spanish, German, Swedish, Tagalog, Portuguese, American Sign Language) which does not serve the over 20 million US adults who speak other languages and come from other cultures. Cultural and language discordance create barriers to quality healthcare for diverse populations (Andrulis & Brach, 2007).

Both research and practice show an urgent need for health interventions to be adapted in culturally and linguistically responsive ways for vulnerable limited English proficient (LEP) communities where cultural and language discordance exacerbate challenges faced in accessing preventive and emergency healthcare. Members of racial and ethnic minority groups have a higher prevalence of having limited health literacy and do not receive the same health care as people who are white and non-Hispanic (AHRQ, 2005; Kutner et al., 2006). Research shows that there are well-documented disparities in outcomes related to out-of-hospital cardiac emergencies for people with LEP which are relevant to time sensitive life-threatening bleeding (Meischke et al., 2010; Moon et al., 2014). A person can bleed to death very quickly; in fact, if bleeding is not stopped, a person can bleed to death in just five minutes. And if that individual has very severe wounds, the time can be even shorter; knowing how to stop the bleeding can save a person's life. A culturally adapted implementation of *STB* in a large Somali community in the Seattle area demonstrated an increase in knowledge and self-efficacy of STB techniques among Somali community members and trust-building between first responders and community members (Stadeli et al., 2022). Like the Seattle project, we collaborated with in-language community members through pre-adaptation focus groups and individual interviews to learn perspectives about emergency healthcare and culturally and linguistically adapting existing *STB* materials using health literacy guidelines. Our focus was on adapting and training multi-ethnic and multi-language community members who live and work in Clarkston; although bi-directional engagement with local first responders was a successful part of the Seattle project, we did not include this as part of our project.

Methods

Sample

Although there is no official data indicating size of language groups, our prior work in the community and discussions with community organizations and healthcare partners led us originally to choose cultural and linguistic adaption in four languages of groups who had most recently arrived in the U.S.(Arabic, Burmese, Somali and Swahili.). Initial focus group (n = 8) and interviewees (n = 2) were from these language groups as were first phase STB training participants (n = 48). We added a second phase in Dari and Pashto after the influx of Afghan refugees into the metro Atlanta area; this phase also included local school, business and civic leaders who serve the multi-ethnic communities in Clarkston (n = 98). Participants were ages 18-65. Flyers were shared throughout local community gathering spots and places of businesses as well as online in community WhatsApp groups and partner community-based organizations. The most effective recruitment occurred through community leaders, health ambassadors and the local school system. Participants registered online through a Google form but were not turned away as walk-ups on the day of training. For the focus groups, interviews, and first phase, participants were incentivized with $20 gift cards to provide information about their life experiences, iteratively review the revised materials, and participate in the pre- and post-intervention surveys. In both phases, participants received a

STB trauma kit, and a certificate of training completion and interpreters were provided with a $20 gift card for their work during the face-to-face training sessions. We received Institutional Review Board approval from both our academic and clinical partners.

Measures

Focus group and interview questions

The first three questions were to learn what participants understood about emergency medical services, emergency healthcare in home countries, and interest in *STB* training. The last two questions were about the materials to find out if the original booklet's words or images were culturally problematic in any way and if the length and content of the booklet was appropriate. For iterative review of the materials, we asked for comments about the revised booklet (does the material represent your culture and language, is the information clear and clearly presented).

Participant survey

In the first phase, participants completed a pre- and post-survey of knowledge and self-efficacy in English or in their own language with the help of community-based interpreters. There were 13 multiple-choice knowledge questions, four self-efficacy questions with yes/no answers, and three qualitative open-answer training evaluation questions. The second phase did not include the survey.

Participant facing materials

STB consists of a presentation led by a trained and certified healthcare professional followed by hands-on activities that teach participants how to apply lifesaving techniques such as packing a wound or using a tourniquet. We evaluated the original *STB* booklet using health literacy guidance and principles with three tools: the Clear Communication Index (Centers for Disease Control and Prevention, n.d.), a tool with 20 evidence-based scored items that represent individual characteristics to inform people's understanding of information, the Patient Education Materials Assessment Tool (PEMAT) (Shoemaker et al., 2013) which measures how understandable and actionable printed patient materials are and Visible Thread Writer (VT Writer), an automated language analysis platform that scores both word documents and pdfs for ease of reading (Okonski, 2022).

Results

Focus group and interview questions

All participants knew what emergency medical services were and were familiar with them both in their home country and in the US. All participants expressed interest in STB training. Participants felt that the original STB booklet was too long (n = 6) and some words and concepts were too complex, particularly in the introductory section (example: first sentence of introductory section: The Joint Committee to Increase Survival from Active Shooter and Intentional Mass Casualty Events was convened by the American College of Surgeons in response to the growing number and severity of these events.). Images of people were fine as they were animated images of people in several skin tones and faces were not shown in detail. For the iterative review of the revised materials, all participants said the material represented their culture and language and the information was clear and clearly presented.

Participant survey

We used SPSSV27 for all analyses. Descriptive statistics (means, standard deviations, frequencies) are reported in Table 1. Our first phase training was attended by 48 community residents, some of whom were also interpreters for the session. Mean age was 38.6 and 63% were women; languages represented were Arabic, Burmese, English, Somali and Swahili. Overall, knowledge of *STB* techniques and behaviors to provide emergency care improved $t(45) = -3.532$,

Table 1. Pre- and post-training results ($n = 48$).

	n	%	Mean (sd)	*P* value
Female	30	63%		
Age			38.6 (8.3)	
Survey language				
English*	32	66.7%		
Swahili	6	12.5%		
Burmese	5	10.4%		
Somali	3	6.3%		
Arabic	2	4.2%		
Knowledge Questions Showing Significant Improvement pre to post; proportions evaluated using exact McNemar's test				
What might cause life-threatening bleeding?				.008
What is the FIRST step when you see someone with life-threatening bleeding?				.013
What technique is NOT recommended to control bleeding?				.031
If you see a person with life-threatening bleeding just below their knee and you have a tourniquet, where should you put it?				.003
If you see a person with life-threatening bleeding, what is the one thing that might make them worse?				.006
Is there a law that protects you if you help another person in an emergency, even if the person has a bad outcome?				.013

*Assisted by interpreters who wrote responses in the English version of the survey.

$p<.001$. Using an exact McNemar's test, six out of 11 knowledge questions showed a significant difference in the proportion of people whose knowledge about *STB* improved. These six questions were specific to *STB* techniques (e.g., *what technique is not recommended to stop bleeding?*) and not to general emergency behaviors (e.g., *who do you call first if there is a medical emergency?*). Over a quarter of attendees reported they gained more confidence, almost half felt the session increased their knowledge, and 61% reported they would feel comfortable performing these basic tasks to stop bleeding. Each small group had a language concordant interpreter who is also a member of the community. We asked several open-ended questions; participants overwhelmingly liked the small group hands-on sessions in their own language, often saying that it made learning easier and they were more comfortable asking questions. Their favorite part of the hands-on training was practicing the techniques on Z-Medica dummy legs with large wounds and gaining confidence in using them.

Participant facing materials

At the beginning of the project, we evaluated the original document using three health literacy tools. The Clear Communication Index showed a final score of 75% (64% Core Section, 100% Behavioral Recommendations Section, 100% Risk Section). Using the PEMAT, the booklet scored 58% for understandability and 100% for actionability. VT Writer measures readability, grade level, sentence length and use of passive voice. Using VT Writer, the booklet scored at a good reading level for broad audiences (grade 5.5) and a moderate readability level (69%); the document scored poorly on sentence length and use of passive voice. In our in-language qualitative focus groups and interviews, we learned that most words and images after the introductory sections were appropriate and described the activities, however there were too many pages, and the writing was in English. We simplified the booklet to be eight instead of 16 pages by removing content on background of the organization and effort, need for learning life saving techniques, and summaries of activities. A health literacy expert revised the content for simplicity using plain language guidelines. The English materials were evaluated again resulting in higher HL scores. The Clear Communication Index showed a score of 100% (100% Core Section, 100% Behavioral Recommendations Section, 100% Risk Section), the PEMAT showed 100% for both understandability and actionability, and VT Writer scored 3.5 grade level reading, and high readability (85%). There were no long sentences or use of passive voice. The booklets were professionally translated and back translated into six languages and were then reviewed by community members to ensure culturally and linguistically meaningful and understandable translations. We did not evaluate the materials for health literacy scores in-language.

Face-to-face training was led by trauma surgeons, emergency department physicians and medical students, some of whom were representative of the communities being trained (e.g., Somali surgical resident, Arabic medical student). For interpreters, we recruited community members who had worked previously in a healthcare environment or were university students with demonstrated English proficiency. Because Clarkston is served by a college campus, there is a large community of multi-lingual individuals with dual and multi-language abilities and excellent written and spoken English proficiency. Sessions were organized by language and interpreters assisted with all written requirements (registration, pre/post evaluation, informed consent) and then assisted trainers in small group in-person with oral interpretation. A few of the medical students were also multi-lingual and were able to provide training in-language.

Discussion

STB has taught over 1.4 million people and trained over 70,000 instructors in 119 countries in the past three years alone. This model of collaborating with community members to create materials and participate in trainings that are culturally and linguistically responsive allowed us to not only provide in-community and in-language emergency preparedness training, but allowed us to engage in other health literacy techniques in the collaboration process, thereby meeting the critical need in healthcare to confirm that the patient/participant understands what you are saying and what they are supposed to do next. Globally, community engagement is an essential public health practice and is a critical element of successful health promotion programs (Yuan et al., 2021). Our *STB* project involved community members in both design and implementation of this intervention which follows health literacy, participatory design, and CLAS guidelines (Cargo & Mercer, 2008; Estrada & Messias, 2015, Grene et al., 2017). Further, our partnership (academic/clinical/community) served as an integral platform to develop a clear understanding of needs and concerns from key stakeholders; while we did not follow strict community-based participatory research methods, we took a collaborative approach to materials design and intervention presentation to ensure incorporation of the

strengths of our clinical and community partners (Norris et al., 2007). Improving the public's health requires engaging with the public to design and implement interventions (Frieden, 2014).

Like knowing how to use CPR, having the skills to stop someone from bleeding to death can directly save lives; for people with LEP, acquiring that knowledge in a culturally and linguistically responsive way builds confidence and increases self-efficacy in bleeding emergency self-care. Language concordant healthcare has shown improvement in clinical outcomes such as coronary interventions, postpartum care, and metabolic syndrome (Biswas et al., 2018; Eamranond et al., 2009; Karra et al., 2018; Parker, 2017). Similar to language concordant healthcare, providing *STB* training in-language can develop trust and improve health outcomes and patient safety in language-diverse populations (Molina & Kasper, 2019).

The most significant barrier was that we started this hands-on, face-to-face project just before March 2020 when the COVID-19 pandemic shut down face-to-face activities and group gatherings. People were overwhelmed with information, misinformation, and disinformation about preventive measures and how to keep their family safe (Ferreira Caceres et al., 2022). For LEP refugees and immigrants living in Clarkston, low literacy in their own language as well as low health literacy compounded their fear and anxiety about COVID-19 (Feinberg et al., 2023; Owen-Smith et al., 2024). Messaging may have been accurate and informative, but it was not culturally and linguistically responsive or understandable for this multi-ethnic community. Confusion about COVID-19, lack of usable and meaningful resources, and daily fear created an environment where talking about anything other than COVID-19 was irrelevant to this community. The 13th CLAS standard is to "partner with the community to design, implement, and evaluate policies, practices and services to ensure cultural and linguistic appropriateness.". Our project was put on hold for about 15 months until community members understood more about COVID-19 and were ready to be engaged to develop training materials and participate in other activities like *STB* training.

This project brought together a group of clinical providers, academicians, and community members; this collaboration took advantage of strengths and skills from each of these different communities which ensured that all perspectives were included in the planning, development, and implementation of this project (Frieden, 2014). From the medical perspective, STB-certified trauma surgeons and emergency department physicians along with their trainees and students led the training and were able to provide additional technical and medical support throughout the in-person training. Our medical team was also composed of people from various cultures and linguistic backgrounds which aided in communicating formally and informally with STB trainees. In addition to bringing subject matter expertise, our academic researchers are experts at working with culturally and linguistically diverse communities; they have been embedded in the Clarkston multi-ethnic refugee community for 20 years and were instrumental in working with the community to provide culturally and linguistically responsive COVID materials during the pandemic as well as preventive health materials afterwards. Engaging community members for their knowledge, trust, and acceptability is a key strength to this project and should be a primary consideration for both research and practice within multi-cultural and linguistic communities.

The first CLAS standard is: "Provide effective, equitable, understandable, and respectful quality care and services that are responsive to diverse cultural health beliefs and practices, preferred languages, health literacy, and other communication needs." In addition to our research findings, there was a great sense of appreciation from community members who attended. In a community where language is one of the primary barriers to health and well-being, participants in the program were grateful for the rare opportunity to learn a life-saving medical skill in-language and with educators who were culturally sensitive and responsive to participant backgrounds and needs (Tucker et al., 2015). There were requests for more trainings in different skills (e.g., infant CPR, General First Aid) and in other languages. Participants also noted a high regard for being awarded a certificate of completion for STB training and their own STB kit to keep in their home, car, or office. There was widespread enthusiasm from all the participants and STB trainers that more trainings were needed and in more language groups. Supporting culturally responsive and in-language health interventions for people who are non-native English speakers can improve health outcomes and community cohesion and promote health equity.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data sharing statement

The data that support the findings of this study are available from the corresponding author, IZF, upon reasonable request.

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