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Reducing Clinical Errors in Cancer Education: Interpreter Training

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Abstract

Over 22 million US residents are limited English proficient. Hospitals often call upon untrained persons to interpret. There is a dearth of information on errors in medical interpreting and their impact upon cancer education. We conducted an experimental study of standardized medical interpreting training on interpreting errors in the cancer encounter, by comparing trained and untrained interpreters, using identical content. Nine interpreted cancer encounters with identical scripts were recorded and transcribed. Using an “Error Analysis Tool,” a bilingual linguist and two bilingual medical providers scored the transcripts for interpreting errors made, including their potential clinical severity. Trained interpreters were 70% less likely to have clinical errors than untrained ones. The likelihood of medical error increased with the length of the concept and decreased with the precision of vocabulary. It is important to train medical interpreters and to ensure their availability in cancer education encounters to minimize the risk for errors.

Background

Racial and ethnic disparities in cancer control are rife [1]. Limited English proficiency is a key barrier to quality healthcare for foreign-born patients [2]. Over 22 million persons in the USA are limited English proficient (LEP) [3]. The language barrier may result in misdiagnoses [4], misuse of diagnostic tests [5, 6], and poor understanding, adherence, and outcomes [7–9]. In cancer education, the challenges and problems related to communicating are amplified. Cancer education requires the transmission of complex and often distressing information to patients [10, 11]. Language becomes a medium for messages of vital content related to survival, safety, and comfort. Language barriers impair shared decision making between patient and physician, making informed consent, for example, difficult [5]. Effective communication can have a positive effect on the patient’s health care outcomes, including enhanced information recall [12], greater satisfaction [13], improved biological status [14], and better psychological adjustment to cancer [15]. Fostering an environment that encourages optimal communication and expression is imperative. In recognition of this, in 2000 the United Kingdom National Health Service recommended that the ability to

communicate effectively should be a precondition of qualification for all health care professionals working with patients with cancer [16].

Interpreting barriers and errors potentially affect all realms of cancer care. Community outreach and education cannot be effective and accurate if not delivered in the appropriate language. Cancer screening results and follow-up plans cannot be communicated. Enrollment in cancer clinical trials may be less likely and if there are interpreting errors, patients may not be truly informed. Medication errors can occur. Antineoplastic agents are highly toxic drugs, and errors surrounding them often have tragic results [17]. Patient education is key to reducing this risk [18]. Without properly understood instruction, patients receiving chemotherapy at home may make mistakes, as may family members administering medications [19].

Hospitals often call upon untrained persons to interpret, including family members and staff [20]. They are prone to omission, additions, substitutions, editing, and volunteered opinions [7, 20]. Confidentiality may be breached; children may be exposed to inappropriate information, and patient openness may be compromised [21–23].

Scant information exists on medical interpreting errors and their clinical impact. We conducted an experimental study comparing errors made by trained and untrained interpreters using standardized, comparable medical content, and interpreter training/assessment standards. Our study was conducted using a scripted English–Bengali clinical encounter. While many cancer studies are conducted with Spanish- speakers, diverse language communities are growing. From 1990 to 2000, for example, the Bangladeshi community in the USA increased by a staggering 350% [24].

Methodology

Institutional review board approval was obtained at New York University School of Medicine.

Script Development

A 1,873-word breast cancer clinical scenario, with medical, psychosocial, and cultural content, was scripted. The patient segment was translated into Bengali. The scripting was done to ensure homogeneity of content across interpreted encounters.

The script had both medical concepts and medical terminology. A “concept” was defined as a word or a group of words, sentence, or sentence group that communicates a defined, delineated idea. A medical term was defined as a discreet medical word.

Error Analysis Tool Development

An error analysis tool was created based on a review of interpreting and linguistics literature. The tool enables the recording and classification of errors and the deeming of a concept’s clinical significance. A concept is considered “accurately conveyed” if the concept’s gist is communicated, without regard to whether or not the interpretation was word-for-word. The accuracy with which discreet medical words are interpreted is noted separately on the tool.

Concepts that are not accurately conveyed are recorded as errors. Within these errors, those that relate to clinical information are noted as clinically related errors. These are further classified as clinically significant if they are likely to impact clinical decision making and outcomes. Some clinically related errors are of no clinical significance. Those of clinical significance are stratified by potential severity: life-threatening, highly significant, moderately significant, and mildly significant. Each concept can have the potential for only one clinically related error. The tool ensures that clinically related error and vocabulary inaccuracy are not conflated.

Data Generation and Error Analysis Tool Application

Two trained and three ad hoc (untrained) interpreters were recruited. The trained interpreters had each received 80 h of medical interpreting training, 30 theoretical and 50 practical hours, at the Center for Immigrant Health, New York University School of Medicine, whose training is comparable with others offered across the country. It delivers instruction on interpreter role, the medical encounter, medical terminology, colloquial language, linguistic concepts (e.g., tense, register, and tone), and interpreting techniques. At the training's end, the students are tested. To date, over 500 interpreters have completed this training. All six trained Bengali interpreters were offered the chance to participate. Two, who had the availability to attend the script readings, agreed. The untrained interpreters included bilingual individuals (Bengali–English) from the community, representative of those who would usually be called upon to interpret: two females with high school and one male with college education. They had previously interpreted for friends and family.

An LEP patient-actor and a non-Bengali-speaking physician read their assigned parts. The interpreter facilitated communication. Nine encounters with the same script were run and recorded. Each trained interpreter interpreted in a different mode for each of three readings: proximate consecutive (the interpreter, in the room, interprets consecutively); remote consecutive (consecutive interpreting via telephone); and remote simultaneous (interpreter, remotely located, provides simultaneous interpreting via a wireless headset). The untrained interpreters interpreted one encounter each, proximally consecutively, the usual ad hoc mode. The recordings were transcribed by an English–Bengali fluent professional transcriptionist. Another reviewed the transcripts to ensure accuracy.

A bilingual panel of one linguist and two medical providers was trained on error analysis tool use. The panelists determined how many of the concepts and discreet terms were conveyed accurately and the potential clinical significance of the concept errors (none, mild, moderate, high, and life-threatening). Each panelist scored each transcript, blind to interpreting mode. The panel then convened to review concepts and terms for which there was disagreement, which occurred less than 5% of the time. The differences were discussed and consensus reached.

Data Analysis: Error Frequency Generation

Using concepts as our unit of analysis, we conducted a series of chi-square analyses comparing each independent variable with the dependent variable of interest, a measure of clinically related error. We also tested for variation among the independent variables and the

interpreter training (trained versus untrained). The key independent variables included script interpreting order and vocabulary precision rate (VPR; discrete medical terms accurately conveyed/total discrete medical terms). Trichotomous VPR values (<40%, 40–79%, and >79%) were created based on the natural distribution of the continuous score.

When necessary, continuous variables were recorded as categorical variables. We then employed a generalized estimation equation technique for the logistic regression analysis, to cluster the concepts within a specific location or individual and control for the expected intra-individual variation. We tested three separate models. The first looked at the unadjusted odds ratios of each independent variable in relation to the outcome, potential clinical error. The second, a multivariate logistic regression, tested the effect of training, script order, VPR, time per concept, and interpreting mode. The third examined only trained interpreters to test the effect of script order on error rate.

Results

There were a total of 1,823 concepts uttered, 1,215 with trained interpreters and 608 with untrained interpreters. The chi-square analyses revealed several areas of statistically significant differences in clinical errors (Table 1). Trained interpreters were 70% less likely to have clinical errors than untrained. The longer the concept, the greater the clinical error likelihood. The more precise the vocabulary, the lower the error rate. The first recording with the trained interpreters had an error rate of 5.2% versus 27.3% for the untrained. Medical error rate did not drop with each successive trained interpreted script reading. With proximate consecutive interpreting, untrained interpreters were 6.25 times more likely to make clinical concept errors than trained.

In the full logistic regression (Table 1), untrained interpreters were four times as likely to have concepts with moderate or greater clinically significant error than trained interpreters and over nine times as likely to have concepts with any clinically significant errors. More precise vocabulary is associated with lower concept error rates. Interpreters with less than 40% VPR were 4.84 times as likely to have concepts with medical error than interpreters with greater than 79% VPR. Untrained interpreters are far more likely to use imprecise vocabulary. Seven percent of the trained interpreters' concepts had less than 40% vocabulary precision. Thirty-six percent of the untrained interpreters' concepts had less than 40% vocabulary precision.

Examples are provided in Table 2.

Discussion

This study is the first experimental design of medical interpreting errors in the cancer encounter. In addition to the glaring errors, there were multiple low-grade errors, which synergistically could produce errors of even greater severity and consequence in the cancer clinical encounter. The implications are disturbing for the understanding of the ramifications of the cancer diagnosis, proper adherence to the medical regimen and medication safety, and informed consent.

The recording by the untrained interpreters had over five times the error rate of the first recording by trained interpreters. Comparing only the proximate consecutive interpreting mode, the untrained interpreters were over six times more likely to have concepts with clinical errors than the trained.

There are study limitations. First, the data were not based on “real” encounters but are re-created scenarios. Although these were created to simulate the real world and provide a suitable experimental design, they do not provide insight into the “real world” of language discordant clinical encounters. Second, the use of an English–Bengali script may be of limited generalizability across the USA. However, it was selected as an example of a bellwether of the communities at risk and represents a language structure of growing numbers of immigrants. These data compel the undertaking of larger studies using the error analysis tool across a variety of languages.

Despite these limitations, the experiment provides support for the conclusion that interpreter training leads to fewer errors in the interpreted cancer education encounter. All too often, ad hoc interpreters are used despite the presence of medical interpreter training programs across the country and bountiful, easily accessible medical interpreter resources [25]. In the absence of fluent bilingual providers who speak the languages of their non-English speaking patients, trained medical interpreters are needed in cancer education. This would likely improve the cancer care and health care experience for the millions of LEP patients in the USA, improve adherence with cancer visits and medication, decrease the risk of medical errors, improve patient safety, and lead to more ethical care.

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Table 1

Variable frequencies and percent error by error severity and training, including multivariate regression of any clinically significant errors

Variable	Multivariate regression		Chi-square analyses			
	Unadjusted OR	Adjusted OR (CI)	Trained		Untrained	
			Mild errors	Moderate or greater errors	Total concept utterances	Total concept utterances
Any concept error						
Interpreters ^a						
Trained	0.13 ***	0.11 *** (0.06,0.21)	95(8%)	94(8%)	1,215	1,215
Ad hoc	1.00	1.00			608	608
Vocabulary precision rate ^a						
<40.0% ***	13.10 ***	4.84 *** (3.12, 7.50)	47 (25%)	36 (19%)	191 (18%)	529
41–79% **	3.98 ***	2.65 ***	31(8%)	33(9%)	366(35%)	518
>79%	1.00	1.00	15(3%)	23(5%)	500(47%)	539

^aTraining p<0.001

* Variable p<0.05,

** p<0.01,

*** variable p<0.001

Note: multivariate logistic regression model also adjusted for mode of interpreting and time per utterance

Table 2

Examples of clinically related errors by ad hoc interpreters

Dr. This test assessed the risk of developing breast cancer looking at two genes, B.R.C.A-1 and B.R.C.A.- 2. That can be linked with hereditary breast cancer.
Int. Omitted entirely
Dr. The results were positive which means that you carry the gene that puts you at risk for developing breast cancer.
Int. The results were correct.
Dr. The results of these tests lead me to conclude that you do have breast cancer.
Int. This test will tell me if you have cancer.
Dr. I think therefore that you have what we describe as stage two or early stage breast cancer.
Int. What?
Dr. I think therefore that you have what we describe as stage two or early stage breast cancer.
Int. Omitted entirely
Dr. One important thing that you have going for you is the fact that the cancer has probably been caught early.
Int. One important thing is the fact that the cancer is working quickly in your body.
Dr. There are three phases that each treatment must go through before it becomes standard therapy that is used in hospitals and clinics.
Int. This will be used in a clinic or hospital.
Dr. The doxy could hurt your heart.
Int. The doxy can give you pain.

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