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The Use of Multiple Languages in a Technology-Based Intervention Study: A Discussion Paper

Eun-Ok Im, PhD, MPH, RN, CNS, FAAN* [Professor], Soo Jin Lee, PhD, RN** [Assistant Professor], Yun Hu, PhD, RN* [Project Coordinator & Visiting Scholar], Ching-Yu Cheng, PhD, RN* [Project Coordinator & Visiting Scholar], Atsumi Iikura, MSN, RN, PHN** [Interventionist], Ayako Inohara, MSN, RN* [Interventionist], Sarah Kim, BSN, RN* [Interventionist], Yuko Hamajima, MSN, RN*, Seon-Ae Yeo, PhD, RN, FAAN***, Eunice Chee, BSE* [Research Assistant], and Wonshik Chee, PhD* [Associate Professor]

*Duke University, School of Nursing

**Korea National Open University, School of Nursing, South Korea

***Tsukuba University, Japan

****University of North Carolina, Chapel Hill

Abstract

Background and objectives—With an increasing number of racial/ethnic minorities in the U.S., nursing research frequently involves the use of multiple languages, especially to promote the understanding of educational materials related to nursing care. Furthermore, with a recent emphasis on innovation in health-related research, the use of technology is prominent in nursing research. However, practical issues in the use of multiple languages, especially in technology-based intervention studies, have rarely been reported and/or discussed in nursing literature. The purpose of this paper is to identify practical issues in conducting a technology-based intervention study using multiple languages among Asian American breast cancer survivors.

Methods—In a large-scale technology-based breast cancer intervention study, research team members wrote memos on issues in translation process and plausible reasons for the issues. Then, the memos and written records were analyzed using a content analysis. By using individual words as the unit of analysis, line-by-line coding was done, and idea categories representing practical issues were extracted from the codes.

Results—Six themes representing the practical issues were extracted. Issues were found in recruiting and retaining bilingual research team members; maintaining consistency in translation process; keeping cultural and conceptual equivalence; repeating IRB protocol modifications; finding and using existing translated versions; and arranging technological aspects related to electronic multiple-language versions.

Conclusion—The use of multiple languages in a technology-based intervention study is feasible. However, it is necessary to effectively manage unforeseen challenges through various strategies.

Keywords

Cultural Competency; Languages; Translation; Technology; Cancer; Research

1. Background

With the population growth of racial/ethnic minorities in the U.S., the use of multiple languages becomes essential in nursing research among the U.S. populations (Angel, 2013; Squires, 2009; Wong & Poon, 2010). The use of multiple languages facilitates racial/ethnic minorities' understanding of questionnaires or educational materials, which subsequently improves their participation in research (Angel, 2013; Squires, 2009; Wong & Poon, 2010).

At the same time, however, it could result in some systematic or potential bias because the use of multiple languages requires more than just translation (Angel, 2013). For instance, due to the complexity and subjectivity of languages in different contexts of culture, it is sometimes very difficult to find the right words that have perfect equivalence of concepts in different languages (Angel, 2013; Squires, 2009). In addition, the use of multiple languages is further complicated by the characteristics and roles of translators (e.g., qualifications of translators) (Angel, 2013; Harkness et al., 2010; Kessler & Ustun, 2008; Squires, 2009; Wong & Poon, 2010).

With an increasing number of racial/ethnic minorities in the U.S., nursing research in the U.S. frequently involves the use of multiple languages, especially to promote the understanding of educational materials related to nursing care (Angel, 2013; Harkness et al., 2010; Kessler & Ustun, 2008; Simpson, 2005; Squires, 2009; Wong & Poon, 2010). Furthermore, with a recent emphasis on innovation in health-related research, the use of technology is prominent in nursing research (Hesse et al., 2005; Hong, Pena-Purcell, & Ory, 2012; Huang, Hung, Chang, & Chang, 2009; Klemm et al., 2003; Wan et al., 2008; Wang et al., 2006; Yoo et al., 2005). However, practical issues in the use of multiple languages, especially in technology-based intervention studies, have rarely been reported and/or discussed in the literature.

The purpose of this paper is to identify practical issues in conducting a technology-based intervention study in multiple languages among three sub-ethnic groups of Asian American breast cancer survivors and to propose directions for future technology-based research using multiple languages. First, the study that is the basis for this paper is concisely described. Then, issues raised during the study process are identified through a content analysis of the minutes and memos of research team meetings, and the issues are discussed in the context of the current literature. Finally, based on the identified issues, suggestions are proposed for technology-based research using multiple languages.

2. The Study as the Basis for Discussion

The study that was the basis for discussion on the issues aimed to determine the efficacy of a technology-based information and coaching/support program on Asian American breast cancer patients' survivorship experience. Based on the Bandura's theory (Pautler et al.,

2001), the program included group and individual coaching/support from registered nurses (RNs) and peers and provided information related to the breast cancer survivorship to change the survivors' attitudes, self-efficacy, perceived barriers, and social influences. The participants included Chinese, Koreans, and Japanese. Chinese are the largest sub-ethnic group among Asian Americans (Hoeffel, Rastogi, Kim, & Shahid, 2012; U.S. Census Bureau, 2011). Koreans are the most rapidly increasing sub-ethnic group among Asian Americans (Hoeffel et al., 2012; U.S. Census Bureau, 2011). Japanese have the highest risk of breast cancer among Asian Americans (American Cancer Society, 2013; Miller, Chu, Hankey, & Ries, 2008; National Cancer Institute, 2008, 2014). Subsequently, four languages (English, Mandarin Chinese [simplified and traditional Chinese], Korean, and Japanese) were used because they are the major languages among the sub-ethnic groups.

The study adopted a randomized repeated measures pretest/posttest control group design. A total of 330 Asian American breast cancer survivors aged over 21 years who had had a breast cancer diagnosis in the past 5 years were targeted to be recruited through online support groups and communities/groups for Asian Americans. For 3 months, the control group was asked to use only the information on breast cancer in multiple languages by the American Cancer Society (ACS) while the intervention group was asked to use both the intervention and the information by the ACS. The intervention included three parts. First, social media sites were included to provide culturally tailored coaching/support by bilingual RN interventionist through web and mobile devices. The participants could interact and share their own experience with culturally matched peers and RN interventionists through the online forum in the sites as well. Second, 15 online education modules were provided, which included information on general topics (e.g., pain management and sleep disorders) and ethnic specific topics (e.g., Chinese herbal medicine for Chinese Americans and Red Ginseng for Korean Americans). Finally, online resources related to breast cancer survivorship were included in the intervention. The study was approved by the Institutional Review Board of the institute where the study was conducted.

Background factors included 14 questions on gender, education, religion, family income, and disease factors, and 8 items on general health, diagnosis of breast cancer, length of time since diagnosis, and stage of cancer. Outcome variables included the needs for help, psychological and physical symptoms, and quality of life. The instruments included the Support Care Needs Survey-34 Short Form (Rutten, Squiers, & Hesse, 2006), the Memorial Symptom Assessment Scale-Short Form (Portenoy et al., 1994), and the Functional Assessment of Cancer Therapy Scale-Breast Cancer (Brady et al., 1997). The psychometric properties (reliability and validity) of all the instruments in multiple languages were tested in Asian Americans (Cronbach's alphas = .76~.96 in Asian Americans). The data were analyzed using an intent-to-treat linear mixed-model growth curve analysis with SAS Proc Mixed (Littell, Milliken, Stroup, Wolfinger, & Schabenberger, 2007).

In this study, translation of the study materials was done using the Translation, Review, Adjudication, Pre-Testing and Documentation (TRAPD) (De Leeuw & Dillman, 2008). The research team set the standards for translation as: (a) the standard-back translation process for the questionnaires and (b) the accuracy check on educational materials by a different bilingual researcher. The questionnaires included the known feasible number of items that

could be translated using the standard-back translation process. However, the educational modules included a high volume of materials that could not be easily done using the standard-back translation process, and the standard-back translation would be meaningless because the accuracy check of the content by another bilingual RN was more important than the accuracy of word translation. Cha, Kim, and Erlen (2007) supported that combining techniques without a back-translation method or a team approach could be effective in translation depending on study environments and resources such as accessibility and availability of bilingual people and research questions (Cha et al., 2007). From the beginning of the study, the standards were in place for the translation process, and we kept the consistent methods.

3. Methods

During the research process, the research team members kept the records of research team meetings, and wrote research memos on practical issues in conducting a technology-based intervention study among Asian American breast cancer survivors using multiple languages. Individual team members also wrote memos on plausible reasons for the issues. Also, the research team had weekly meetings, and discussed and recorded newly emerging or existing issues. Then, the minutes and memos were analyzed using the content analysis by Weber (Weber, 1990). By using individual words as the unit of analysis, line-by-line coding was done, and idea categories representing practical issues were extracted from the codes.

4. Results: Practical Issues

4.1. Recruiting and Retaining Bilingual Research Team Members

The study required at least six bilingual research team members (two bilinguals of English and Chinese, two bilinguals of English and Korean, and two bilinguals of English and Japanese). However, because the study was conducted in a South-Eastern area of the U.S., the number of available bilingual people tended to be limited.¹⁵ Furthermore, the interventionists needed to be RNs because they needed to provide interventions as nursing care. Therefore, with the limited number of bilingual people in the area, finding bilingual RNs was a real difficulty in the study. It took more than 6 months to have all six bilingual research team members in place.

Most of the candidates for bilingual interventionists were international students or scholars who needed to make visa arrangements to be hired for the study. The visa arrangement process took at least 3 months for each hire. Moreover, additional delays occurred by unexpected personal situations such as pregnancy and new jobs during the hiring process. Therefore, various hiring strategies were used to recruit and retain bilingual interventionists, which included hiring personnel in other university or hospital settings and even in other states and other countries. Due to the difficulties in recruiting and retaining bilingual interventionists, there were frequent changes in the research team members, which subsequently delayed the conduct of the study. New members needed several weeks to familiarize themselves with the study, other team members, and participants, and they also needed to reconnect with and rebuild trust with the gatekeepers and research participants.

4.2. Maintaining the Consistency in Translation Process

Translators from different immigration generations and different geographical areas had differences in word selections or sentence compositions. For example, the word "information" was translated differently in Simplified Chinese used in Mainland China and Traditional Chinese used in Taiwan. Also, the word "dear" was not used in greeting the participants in both languages. "Lady" was used in simplified Chinese while 'Miss' was used in traditional Chinese. In addition, for many early Chinese immigrants who came from Hong Kong and Taiwan, Cantonese and traditional Chinese were used separately. Thus, the use of simplified and traditional Chinese did not cover this specific population among Chinese Americans although they could read some materials in traditional Chinese.

Interestingly, there existed a number of cases that a word or a phrase in English was translated simply phonetically. In Japanese, *katakana* is usually used for the transcription of words from foreign languages (direct phonetic translation) because the specific words do not exist in Japanese or the exact translation of the words is impossible. Nowadays, *katakana* words are used more frequently than translated Japanese words (translated into original Japanese words). Subsequently, one might use a translated Japanese word while the other might use *katakana*. For example, "survivors" could be translated to "サバイバー (sabaiba-)" or "生存者 (seizonsha)." In general, "survivor" is translated to the latter "生存者 (seizonsha)." However, "生存者 (seizonsha)" has some negative connotation to cancer survivors. Thus, in the oncology field of Japan, "survivor" and "survivorship" are established as technical terms, and "survivor" is translated into "サバイバー (sabaiba-)" that is a direct phonetic translation of the English word using *katakana*. Because multiple people translated the same materials into Japanese in this study, we needed to set the rules for translation of this kind of words. For instance, we set the rules that "survivor" should be consistently translated into サバイバー (sabaiba), and "mobile" should be consistently translated into モバイル (mobairu).

4.3. Keeping Cultural and Conceptual Equivalence

The most difficult part of the translation was to keep cultural and conceptual equivalence in translation of the questionnaires. Furthermore, even when the words in the questionnaires were accurately translated, Asian American breast cancer survivors tended to choose a midpoint on a scale rather than an extreme value. Also, during the translation process, we needed to consider the context of a word because a specific word had different meanings depending on the context. For example, in this study, "ethnicity" meant Chinese, Korean or Japanese. However, for Chinese Americans, "ethnicity" in their language meant Han, Zang, Yi, Chaoxian, or others because there existed 55 ethnic minorities in the mainland China and each ethnic group has different traditions. Thus, we needed to further explain what we meant by "ethnicity" for Chinese participants.

In this study, the participants sometimes misunderstood or had difficulties in understanding the meanings of some questions/items that are literally translated from English to the target language. The translation was literally excellent, but confusing to the participants. An example is the use of two words, "fatigue" and "tiredness," that represent different degrees of tiredness. Despite different meanings and translations of these two words in Mandarin

Chinese, not all Chinese people could differentiate these two words if definitions were not clearly specified. Thus, in some cases, we needed to use the degree of tiredness and specify the degree instead of using the two different translated words. Also, when translating the words for a 5 point pain scale (0=not at all, 1=a little bit, 2=somewhat, 3=quite a bit, and 4=very much), there existed no accurate Chinese words to differentiate 'a little bit' and 'somewhat.' Thus, we needed to explain the scale with a note. Translation in Korean also had similar issues related to the 5 point pain scale ("a little bit" versus "somewhat").

4.4. Repeating IRB Protocol Modifications

Another issue in this study was the necessity of getting repeated IRB approvals for modifications. English versions of study materials are mandatory across the institutes, but including all language versions could be optional or required depending on the institutes. The institute where the researchers were affiliated with during the pilot study did not require all language versions, but the measures to ensure the accuracy of translation were required to be specified. The institute where the full study was conducted required all language versions and CVs of all translators. Thus, whenever a modification was made in the informed consent, questionnaire, intervention protocol, educational modules, and/or data collection process, translation into multiple languages (four more languages including simplified and traditional Chinese) was mandatory, and these translated modified versions needed to be submitted for the IRB approval. Also, whenever bilingual research staff members left the team, IRB approvals for the modification in research team members needed to be obtained, which subsequently delayed the study process. For example, when the project website was ready for data collection, all language versions (English, simplified Chinese, traditional Chinese, Korean, and Japanese) of the project website needed to be in place. Then, one of the consultants gave a feedback on some wordings in the English project website, which caused subsequent translation of the wordings into multiple other languages and required another IRB modification on the study materials.

4.5. Finding and Using Existing Translated Versions

Because we used a set of standardized scales to measure our primary and secondary outcomes of the study, there were several existing language versions of some of the questionnaires. For example, a Japanese version of the FACT –B was available. During the process of getting the permissions from the authors of the scales, we also found several additional multiple language versions of the questionnaires that were not published. In a pilot study before this full-scale study, there were no existing different language versions of the specific questionnaires, but the original authors had developed different language versions of the questionnaires during the time gap between the pilot study and this larger study. Therefore, we needed to throw away some language versions of the questionnaires that we had already translated. Then, during the process of checking the accuracy of translation, we found some errors in the existing versions of the questionnaire in different languages by the original authors. However, because the questionnaire was translated and tested by the original authors, we should keep the original translated versions of the questionnaires that were provided by the original authors.

4.6. Technological Issues

An issue in the use of multiple languages in a technology-based intervention study was technological issues related to the versions of web applications and/or software. Because multiple languages were involved, the electronic questionnaires that were uploaded to the REDCap system needed to be in multiple languages. The REDCap system is a web application for developing and managing online surveys/questionnaires and databases. The REDCap is one of the most frequently used web application for research studies although it could be used to collect other types of data (e.g., education studies, etc.). The first issue that we had was the comparability between different versions of the REDCap systems that were used in different institutes. As mentioned above, the pilot study was conducted in one institute, and the full-scale study was conducted in another institute due to the research team's move. Therefore, the data dictionaries from the pilot study needed to be imported to the REDCap system of the new institute. Because the new institute used an older version of the REDCap system, the data dictionaries of the multiple language versions from the old institute could not be simply uploaded, and a different strategy needed to be adopted to solve the technological problems. Subsequently, unexpected technological issues were raised during the set-up process of electronic questionnaires in multiple languages. Yet, development of multiple language versions of the project website was smoother than development of multiple language versions of the electronic questionnaires because both institutes were using the same version of software and technological guidance.

5. Discussions

In this paper, based on a technology-based intervention study among three sub-ethnic groups of Asian American breast cancer survivors (Chinese, Korean, and Japanese), practical issues in using multiple languages in a technology-based intervention study were discussed. The issues included those related to recruiting and retaining bilingual research team members; maintaining consistency in translation process; keeping cultural and conceptual equivalence; repeating IRB protocol modifications; finding and using existing translated versions; and arranging technological aspects related to electronic multiple-language versions. All these findings are consistent with the literature on multi-lingual research in traditional formats (e.g., face-to-face), but these findings are new to the literature on technology-based intervention studies mainly due to a lack of knowledge on this new field.

First of all, the literature on multi-lingual research is clear that translation highly depends on the quality of translators (e.g., skill, knowledge, and experience) (Sperber, 2004). In reality, even professional translators have a lack of knowledge on specific areas of interests (e.g., medical terms), and may simply do literal translation without adequately considering cultural nuances (Sperber, 2004). Furthermore, simple literal translations could make the translated phrases/sentences difficult to understand because of differences in grammar or word meanings between English and other languages. However, semantic or other types of translations that are not word-for-word translations could also make the original and back-translated phrases/sentences different and cause a validity issue. Furthermore, bilingual translators may not automatically share native English or native second language speakers' beliefs and values (Ervin & Bower, 1952; Hunt & Bhopal, 2004). They may have difficulties

in dealing with colloquial phrases, slang and jargon, or idiomatic or emotionally evocative terms (Sperber, 2004; Van Eeden & Mantsha, 2007). More importantly, there are possibilities that bilingual translators unconsciously add words directly from the second language, increase the use of words similar to those in the second language, and borrow stylistic devices (Ervin & Bower, 1952). Also, translators' own personal understanding and interpretation of words (based on their own experience and learning) could drastically influence scientific translation (Kristjansson, Hardarson, & Audunsson, 2003). Thus, the literature suggests that the recruitment and retention of qualified bilingual translators would be essential in multi-lingual studies.

The findings reported in this paper basically agrees with the literature and supports the importance of qualified bilingual translators even in a technology-based intervention study using multiple languages. As presented above, recruiting and retaining bilingual research team members could be the first issue to deal with in any studies involving multiple languages. Except the researchers in the geographical areas where a number of potential bilingual research team members are available, researchers would have difficulties in recruiting and retaining bilingual research team members especially when they conduct multi-lingual studies like ours. In this study, not limiting the recruitment pool to a specific institute or geographical area was helpful. Also, due to the low retention rate of bilingual research team members, the plan for transitions from an old member to a new member needed to be established first, and frequent training sessions were necessary.

The equivalence of concepts in translating multiple languages is much more important in quantitative studies compared with qualitative studies because of its stance on objectivity (Angel, 2013). Quantitative research that frequently uses questionnaires targets to compare numbers among different languages, and the goal of translation is to have similar latent constructs on metrics using different languages (Angel, 2013). However, it is well known that the assumption on the same or similar latent constructs on similar metrics across different languages is impossible due to differences in many sociocultural factors across different language groups (Angel, 2013; Larkin, Dierckx de Casterlé, & Schotsmans, 2007). Also, this could result in serious potential bias in the measurements (Angel, 2013; Larkin et al., 2007). Culture also influences the perception of health and illness and affects the perceived importance of symptoms (Sperber, 2004). Furthermore, a word in one culture does not necessarily mean the same construct in another culture (Small, Yelland, Lumley, & Rice, 1999). Indeed, the literature warns that translation process should consider the context of a word because a specific word could have totally different meanings depending on the context (Harzing, 2006; Small et al., 1999). The literature also indicates that participants could misunderstand or have difficulties in understanding the meaning of questions/items that are literally translated from the original language to the target language (Weeks, Swerissen, & Belfrage, 2007). The translation could be literally excellent, but confusing in actual applications to a different cultural group (Sperber, 2004). The findings reported in this paper are totally consistent with these issues from the current literature on multi-lingual research in traditional formats (e.g., face-to-face).

The literature is also clear that administrative issues tend to be more important than methodological issues in decision making on research process in multilingual settings (Ervin

& Bower, 1952). The findings reported in this paper agree with the literature. Whenever unexpected issues came up, the research team needed to promptly adopt alternatives and move forward the research process with available limited budget and limited qualified personnel as suggested in the literature (Ervin & Bower, 1952). However, at the same time, we needed to set the principles of translation process that we kept throughout the research process to be consistent on the congruence and equivalency of the content in the questionnaire and educational materials, as suggested in the literature (Van Widenfelt, Treffers, De Beurs, Siebelink, & Koudijs, 2005). As discussed above, we had several cases that there existed no exact or similar terms available in Chinese, Korean, or Japanese. Although the phonetic translation of foreign words into Asian languages are sometimes criticized as the influences of *Chinglish*, *Konglish* or *Japanenglish* (Jing & Zuo, 2006), there was no way to translate some English terms into these languages.

As described above, many original authors of the instruments that were used in this study have recently developed their own multiple language versions of questionnaires. In other cases, other researchers adopted, translated, and tested different language versions of English instruments. Van Widenfelt et al. (2005) suggested that researchers would need to check with the original authors, do additional literature searches, and get consultants' advice to check the availability of different language versions of specific instruments. In our study, we were able to identify existing translated versions of questionnaires through checking with the original authors and collaborators in other countries using the specific languages. Thus, this finding is also consistent with the literature.

This discussion paper has several limitations. First of all, the findings of this paper need to be carefully interpreted and generalized though because the study was conducted only among three sub-ethnic groups of Asian Americans in the U.S. Furthermore, the study was a technology-based intervention study that required the use of computers and/or mobile devices throughout the research process. Finally, the study was conducted on a university setting in a South-Eastern area of the U.S.

5. Conclusions and Implications

In this paper, based on a technology-based intervention study among three sub-ethnic groups of Asian American breast cancer survivors, practical issues in using multiple languages in a technology-based intervention study were discussed. Issues were found in recruiting and retaining bilingual research team members; maintaining consistency in translation process; keeping cultural and conceptual equivalence; repeating IRB protocol modifications; finding and using existing translated versions; and arranging technological aspects of electronic multiple-language versions.

Based on the issues, we want to conclude this paper with the following suggestions for future researchers who consider using multiple languages in their technology-based nursing research. First of all, we suggest that researchers make plans for recruitment, retention, and training of bilingual research team members in advance. We also suggest that researchers set the standards for translation process at the early stage of the study and need to be flexible in their decisions making on research process. As we did in our study, researchers need to be

flexible in their decision making, but need to set the minimum rules for direct phonetic translations in advance and as the study progresses. Also, we suggest the use of “transcreation” or adaptation process. Indeed, the use of “transcreation” or adaptation process has been frequently reported in multi-lingual research (Vani Nath Simmons, Cruz, Brandon, & Quinn, 2010; Vani N Simmons et al., 2011). Here, “transcreation” means that the words in the original language are fully re-written into the target language to have the same concepts/construct and to have the same level of literacy and cultural appropriateness. Researchers also need to check their institutions’ IRB policies related to the use of multiple languages at an early stage of the study so that they could prepare to meet the requirements. We suggest that the researchers prepare the documents related to qualifications of translators, the rules set to ensure the consistency in translation among different translators, and the measures to ensure the accuracy of translation. Also, we suggest that the researchers prepare multiple language versions of the informed consent, study flyers, and sample study announcements in advance. In addition, researchers need to contact the original authors, conduct literature searches, and seek experts’ advice to check if there already exist different language versions of specific instruments. Finally, we suggest that researchers check on the versions of electronic data system or software before planning their studies using multiple language versions and try to adopt the most recent version of the system or software. Yet, as in our study, researchers may not have the control of their institutions’ versions of the system or software. Thus, at least, researchers need to be aware of the versions of the system or software that are available in their institutions.

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What is already known about the topic?

- The use of multiple languages facilitates racial/ethnic minorities' understanding of questionnaires or educational materials, which subsequently improves their participation in research.
- The use of multiple languages could result in some systematic or potential bias because the use of multiple languages requires more than just translation.
- The use of multiple languages is further complicated by other contextual factors including the characteristics and roles of translators.

What this paper adds?

- All the issues reported in traditional formats of intervention studies (e.g., fact-to-face interventions) are found in a technology-based intervention study using multiple languages.
- It is important to recruit and retain qualified bilingual translators even in a technology-based intervention study when multiple languages are adopted.
- Although the phonetic translation of foreign words into Asian languages are sometimes criticized as the influences of Chinglish, Konglish or Japanenglish, there is no way to translate some English terms into these languages.

Table 1

Practical issues in the use of multiple languages and implications for future research.

Practical Issues	Implications for Future Research
<ul style="list-style-type: none"> Difficulties in recruiting and retaining bilingual research team members. 	<ul style="list-style-type: none"> Establish the plan for transitions from an old member to a new member. Plan frequent training sessions. Make plans for recruitment, retention, and training of bilingual research team members in advance.
<ul style="list-style-type: none"> Maintaining the Consistency in Translation Process 	<ul style="list-style-type: none"> Set the standards for translation process at the early stage of the study. Need to be flexible in decisions making on research process.
<ul style="list-style-type: none"> Keeping Cultural and Conceptual Equivalence 	<ul style="list-style-type: none"> Set the rules for direct phonetic translations in advance and as the study progresses. Use “transcreation” or adaptation process.
<ul style="list-style-type: none"> Repeating IRB Protocol Modifications 	<ul style="list-style-type: none"> Need to check institutions’ IRB policies related to the use of multiple languages at an early stage of the study.
<ul style="list-style-type: none"> Finding and Using Existing Translated Versions 	<ul style="list-style-type: none"> Prepare the documents related to qualifications of translators, the rules set to ensure the consistency in translation among different translators, and the measures to ensure the accuracy of translation. Prepare multiple language versions of the informed consent, study flyers, and sample study announcements in advance.
<ul style="list-style-type: none"> Technological Issues 	<ul style="list-style-type: none"> Need to contact the original authors, conduct literature searches, and seek experts’ advice to check if there already exist different language versions of specific instruments.
<ul style="list-style-type: none"> Technological Issues 	<ul style="list-style-type: none"> Check on the versions of electronic data system or software before planning their studies using multiple language versions. Try to adopt the most recent version of the system or software.