Assessing linguistic comprehensibility of healthcare translation using the POCA model

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Introduction

Diabetes education materials embedded with health literacy principles make it easier for readers to navigate, understand and use their information and services to make effective decisions and take appropriate health action. Translated materials provide a useful educational tool for diabetes self-management among migrant populations in English-speaking countries. Patient education entails the development of written materials about diabetes processes, medical management and self-care instructions (Williams et al., 1998). Translated health education materials have significant potential to reduce health inequalities among ethnic minorities with low English and health literacy levels. However, research demonstrates that existing multicultural diabetes materials have various drawbacks which have limited their wide acceptance (Borrell et al., 2006; Brue et al., 2003; Huff et al., 2015).

Health research on Chinese immigrants found that lack of culturally effective health education resources and limited health literacy levels are two key reasons which have resulted in the unwillingness and inability among migrant patients to adhere to treatment plans (Tseng et al., 2013). Similar research highlights the pressing need to evaluate the comprehensibility, cultural suitability and linguistic accuracy of health education materials, as this is essential for the health recommendations to be translated in a way that the target migrant patients can follow. The main purpose of our study is to identify common issues in diabetes translations in Australia by using a patient oriented and culturally appropriate (POCA) health translation model, which has been developed by integrating international guidelines for health translation instruments and insights from working directly with culturally and linguistically diverse (CALD) patients in Australia, especially Chinese immigrants.

The objective of this study is two-fold: first, to examine the effectiveness of the health education information in the diabetes translation selected for study. Second, to explore the feasibility that the Chinese migrant readers can act upon the health education information in the translation in their daily self-care for diabetes while living in Australia. The target audience for this study are primarily Chinese Australian immigrants (native Mandarin speakers from the mainland China) with type 2 diabetes, and their families and caregivers. In general, they are likely to have limited exposure to acculturation in the Australian healthcare context, and little to no English language knowledge. This group of Chinese immigrants provides the focus of our study.

After advice from CALD health workers, the National Diabetes Service Scheme (NDSS) CALD working party, diabetes educators, dietitians, exercise physiologists and endocrinologists (diabetes specialists), an extensive search for Chinese diabetes translations
A large number of printed health translations that are publicly available in Chinese (simplified) were collected between March and May 2017. This search involved obtaining patient materials distributed at Australian hospitals and clinical practices. Diabetes Australia represents the national authority on diabetes education and related health promotion in Australia. The latest multicultural diabetes education factsheets from Diabetes Australia were the versions of June 2016. This updated series of CALD materials contains eight sets of factsheets. Amongst these materials, ‘Physical Activity’ discusses the lifestyle management for patients living with type 2 diabetes. This is the only material available nationally on CALD physical education activity. The translated simplified Chinese version of ‘Physical Activity’ was selected for in-depth analyses in our study.

**Patient-oriented and culturally appropriate health translation model**

Our study proposes a patient-oriented and culturally appropriate (POCA) model to assess health translation quality. The following sections will discuss a few typical issues associated with health translation accessibility and readability using the POCA analytical framework. The subcategories listed in Table 4.1, using WHO translation model as a basis, are not intended to be exhaustive and can be further enhanced and adapted for other migrant population groups with special needs, for example, illiterate migrants who prefer audio-visual to printed health education resources.

**Linguistic comprehensibility (LC)**

As stated from the outset of the study, in the context of health translation, it is important to consider the choice of expressions and phrases when adapting an original English sentence for the target readers from a different cultural background. The following subcategories of the patient-oriented, culturally appropriate health translation assessment model provide practical suggestions for health translators and educators from the perspective of the linguistic comprehensibility of health translations which tend to contain specialised medical terms and health information that requires higher education and health literacy levels.
Table 4.1 The POCA health translation model

| Cultural Accessibility                      | Use of culturally acceptable symbolic messages: visual aids, colours |
|                                          | Include significant cultural beliefs to influence on lifestyle       |
|                                          | Make use of familiar health slogans or themes in the target language |
|                                          | Use credible sources’ endorsement (as perceived by CALD) of the translations |

| Linguistic Comprehensibility               | Use of simplified terms to illustrate complex health and medical concepts |
|                                          | Avoid abstract translation: use concrete, familiar terms               |
|                                          | Increased coherence/logic using language specific writing techniques   |
|                                          | Use positive expressions and use qualitative not quantitative language |
|                                          | Use simple sentence structures, avoid embedded, complex phrases        |
|                                          | Accurately translate a health condition or medical terminology Prevent any inaccurate translation which can cause health consequences |

| Patient-centred Communication Style        | Use personalised style such as first or second person. |
|                                          | Avoid commanding or authoritative tone                  |

| Informational Practicality                 | Use ethnic and culture-specific examples to illustrate viable lifestyle modification |
|                                          | Use familiar examples: food preparation techniques; exercise habits |
|                                          | Recommend culturally and economically viable behavioural changes. |
|                                          | Apply the content to the target audience’s cultural experience |

Use of simplified terms to illustrate complex health and medical concepts (for example, health risks)

The choice of characters in a giving cultural context is important in any health translation intended for health education purposes. Conveying complex health messages in an easy-to-understand format is an important and highly desirable feature of health translations. This result may be achieved by using high-frequency lexical constructs (for example, four-character words, idioms and colloquial expressions in Chinese). The usage of health-related high-frequency linguistic constructs or devices helps to bring down the communication barriers between health professionals and patients by delivering complex information about patient health conditions.
and recommended medical treatments in a more direct and informative way without causing concerns among the migrant patients due to their low education or health literacy levels. Adding a reasonable number of idioms and colloquial language can be seen as practical means of language localisation, which can reduce the reading difficulty of the original English text. Chinese idioms and colloquial language reflect the cultural history of China as well as Chinese health related values. These linguistic constructs and elements can help bridge the knowledge and communication gaps between western and traditional Chinese health cultures. In our study of the translated factsheet of ‘Physical Activity’, it was found that the use of high-frequency Chinese linguistic and textual constructs was indeed very limited.

Avoid abstract translation: Use concrete and familiar expressions

In the health translation process, the inappropriate choice of words and phrases from the target language (i.e. unfamiliar phrases in the Chinese language) is an indication of low readability of the translated materials. Here are some examples of health translation which increase instead of reducing the reading difficulty of the Chinese translation. Firstly, we found in the Chinese translation of the factsheet of ‘Physical Activity’ that the classic Chinese phrase ‘罹患’ (suffering) was used, which is not used in everyday Chinese language. This phrase requires the readers to have a relatively high literacy level and be familiar with classical Chinese literature, so that they can accurately pronounce this character word and comprehend its meaning in the health context. The high-stroke Chinese character ‘罹’ is very difficult to recognise and pronounce, which may cause the translation to be even more complex and less accessible than the original English text. This typical word-choice issue resulted in making the Chinese translation exceptionally difficult to read when the readers do not have the required high literacy level in their own language. Therefore, the use of this phrase cannot help achieve the educational purpose of the translation, as it cannot effectively engage with the Chinese migrant readers. This translation strategy is not in line with the patient-centred health education philosophy. Our proposed suggestion is to replace this difficult phrase ‘罹患’ with a much simpler and more neutral expression ‘出现’ (happen/occur).

Similarly, more linguistic issues in the Chinese translation at the word or phrase level provide misleading information to Chinese readers. For example, the word ‘fund’ was translated as investment (‘基金’). Here in the context of private health insurance, ‘fund’ means ‘health insurance’. The corresponding Chinese translation should be ‘保险’, and the whole phrase should be translated as private health insurance (‘私人医疗保险’). Linguistic issues in health translation can result in misinterpretation of the health recommendations and affect the understanding of the intended key messages.

The final translation issue identified in this subcategory is the use of English abbreviations in the Chinese health translation without any explanation. The abbreviation ‘NDSS’ stands for the National Diabetes Service Scheme. While this term is used as part of the daily language among local residents, such abbreviations may not be readily known to the new arrivals. Similarly, two other Australian health organisation terms, ‘Medicare’ and ‘Diabetes Australia’, remained in English throughout the Chinese translation.
These unfamiliar acronyms and untranslated English phrases can make the reading more difficult to migrant readers with limited knowledge of the Australian healthcare system. Simply, they may quickly lose interest in continuing reading the health translation material. In the Australian healthcare system, ‘NDSS’ and ‘Medicare’ are the most commonly used health terms, so it is important for migrant patients to understand them. For this purpose, it is better to keep both languages available, but the English abbreviation should be fully spelt out and be kept in brackets next to the corresponding Chinese translation. In this way, health translation can achieve the key aim of improving the health knowledge of local healthcare systems among the intended readers.

Increase the coherence and logical structure of health translation using language-specific writing techniques

In our study of the Chinese translation of the factsheet of ‘Physical Activity’, there were many instances which showed that the syntactical structure of the Chinese translation was not as natural or idiomatic as that of original Chinese texts. In such situations, while the individual Chinese characters were understandable, the meaning and purpose of whole sentences in the translation were less clear. Studying such translations can be a frustrating reading experience for some readers, as the disturbed sentence flow would prove distracting and sometimes misleading. Lack of syntactic coherence may well further compromise the readers’ ability to process and understand the translated health information. At the completion of reading the material, the readers are likely to be left confused about the credibility of the health information given in the translation. This linguistic issue caused by the lack of coherent sentence structure can negatively impact the readability of the Chinese translation.

One typical example quoted below adopted a literal translation approach to the English sentence ‘plan the times and set the days to do your exercise, like an appointment’. The Chinese translation copied the original English sentence structure without necessary syntactic adaptation. The subsequent Chinese translation exhibited lack of idiomatic clarity, as the sentence did not flow naturally. Chinese readers may feel that two different pieces of information had been pulled together – ‘plan the number of times and days for the exercise’, and ‘make an appointment with someone’. Possible reasons for such undesired reading experiences are the lack of clear, logical syntactic structure; and the semantic change that made the translated sentence unbalanced vague. Patients may have to slow down the reading and spend extra time to process the intended message, which will increase the risk of withdrawal from the self-study of the health translation and education resources.

This particular example highlights the importance of the translation to preserve as much as possible the linguistic and syntactic structure of the original target language, in this case, Chinese. To resolve this issue, necessary syntactic and grammatical transposition techniques are recommended. The suggestion is to adjust the grammatical and stylistics elements of the translation by having the adjective phrase (‘like an appointment’) at the beginning of the sentence. Other errors also have been identified within the same sentence i.e., ‘times’ and ‘appointment’. ‘Times’ was mistakenly translated as the frequency or number of times (‘次数’), changing the semantics. In the context, it refers to the time and duration of a day (‘时间’).
The translation of ‘appointment’ became making a booking (‘预约’), which is not a common practice in China where people like to walk in to medical appointments. To make the message more engaging, the translation could be extended beyond its superficial meaning. By applying the oblique translation technique (adaption or modulation), it can be translated as ‘plan a date for the loved one’ (计划约会). The phrase ‘plan a date’ (‘计划约会’) used in this situation treats the exercise as a metaphor for dating someone that can subtly enhance the enthusiasm to do physical exercise. The suggested translation implies that planning a date needs a clear goal to be achieved step by-step, which helps to deliver the key message in this section. The suggested translation can make the material more readable and motivational. Many other parts of the translation may be improved by using user-oriented and culturally effective health translation and adaption strategies. Our suggested approach focuses on creating a more natural flow of the translated text by introducing necessary syntactic and grammatical adaptation.

Use positive expressions; use qualitative not quantitative language

Negative conjunctions and authoritative phrases in the translated material have twisted the original tone and supportive language. The examples below reveal how readers might become much less receptive to the information at the time of reading. Some readers may feel uncomfortable as they interpret the pushing and demanding messages between the lines. The typical example for this translation issue is the demanding term ‘must’ (务必) that has appeared three times in the whole material. This authoritative expression sounds like a military order. It implies that the authors mandate readers to take action immediately on being told to do so. In Chinese culture, such an expression can be deemed impolite and rude. The consequences of employing such a translation are that the readers may subsequently feel inferior, which is counter to a patient-centred emphasis that the individual is an expert in his or her own diabetes management. The command style of the instructions implies that the authors know more than the readers or the patients, which unintentionally creates the imbalanced relationship. Moreover, issuing commands or orders often results in a failure to adopt self-care activities. Most of all, the translation dismisses the original supportive tone of the English text. It is proposed in Table 4.6 that an alternative translation can be ‘have to’ (一定要) with a more humanised and affirmative tone. The phrase ‘have to’ (一定要) explicitly promotes the empowerment and directs the self-management decision-making process (i.e. needs for hypotreatment) to the readers themselves. Similarly, the negative conjunction ‘however’ (然而) has shifted the whole sentence into an unsupportive environment to discourage the healthy behaviour initiatives (i.e. slow-peace and low intensity exercise). Our suggested translation is ‘even if/no matter how’ (哪怕), offering a more encouraging tone to motivate lifestyle changes. Overall, these two examples are likely to discourage the patient readers from pursuing active self-management and good self-care. Our analysis shows how a culturally appropriate health translation can foster patient-centred education through translating with a positive and upbeat tone, giving emphasis on what the patient readers can do to improve their own well-being.
Use simple sentence structures, avoid embedded, complex phrases

English and Chinese have completely different grammatical structures. Often the application of direct translation techniques can cause a rather complex and confusing phrase or sentence structure in the Chinese language. The illustrated problematic sentence presented in Table 4.7 resulted from literal translation. The original English text is ‘make sure you have some easily absorbed carbohydrate available (such as jellybeans, glucose tablets or gels) so you can treat a hypoglycaemia (hypo) if necessary’, which sounds natural and supportive. However, the original English text has a couple of key ideas embedded in a single sentence. A direct translation generates a demanding and confusing feeling to most readers, requiring a very high health literacy to be able to extract the information necessary to successfully comprehend the meaning. The direct Chinese backward translation for the sentence is ‘please must have some easily absorbed carbohydrate (such as jellybeans, glucose tablets or jellies), so when it is necessary, you can treat hypo’. Obviously, the main message has become disorganised and illogical. The direct translation built up an overpowering ‘wall of text’ which makes the reading challenging. To reassemble this disordered sentence, the pronoun ‘你’ (you) has been purposely added in the suggested translation to assist with shifting the personal responsibility for treating hypo back to the target audience in a positive and reader-friendly environment in a way can emphasise diabetes self-management. It is important to illustrate the use of easily absorbable carbohydrates to quickly treat hypo. Therefore, the amended translation unpacked the messages by adding a separate sentence to reveal the reason for the action, while reducing the required readability. Health translation should always give the context first, and then incorporate the translation into the text without altering meaning and generating a sense of awkwardness in the target language.

Accurately translate a health condition or medical terminology and prevent any inaccurate translation which can cause severe health or clinical consequences

The golden criterion for assessing the quality of health translation is the absolute accuracy of the medical terminology and information while maintaining the simplicity to engage with readers having low health literacy. In any health materials, errors or inaccurate expressions from translation regarding medical and clinical information can be very dangerous. Regrettably, there are a few errors in medical translation in this material. First of all, the most critical error occurs in the hypoglycaemia treatment section, which can cause the most adverse health outcomes. The term ‘glucose gels’ is falsely translated into ‘fruit jelly’ (果冻).

Glucose gel is a medical term that refers to monosaccharides, often understood as pure sugar in a gel-like consistency. This substance is used in a medical emergency in order to achieve the rapid raise of blood glucose levels. Moreover, each dose of a gel has been specifically manufactured to only contain 15 grams (1 exchange of carbohydrates). In this case, a reader with poor health literacy would not have the competence to recognise this translation mistake. If a patient were to passively follow the advice from the wrong translation in the event of hypoglycaemia, the individual could suffer from adverse outcomes including unnecessary hyperglycaemic excursions (very high blood glucose levels), psychological implications (fears caused by the unpleasant hypo recovery and negative attitudes towards physical activity), and
risks of aspiration and hospitalisation. Hence, this translation mistake is intolerable from the health information quality perspective.

To solve this mistake, a few translation techniques (e.g. borrowing, reformulation or adaption) can be considered to find the closest accurate translation of the English phrase ‘glucose gel’. The recommended translation is either ‘edible glucose gel’ (葡萄糖食用凝胶) or ‘medical-grade dextrose jelly’ (药性葡萄糖冻). In the same line of that sentence, there is another issue in medical terminology translation. Although the glucose tablets were correctly translated through the literal translation technique, the translation ‘glucose tablets’ (葡萄糖片) actually means glucose (candy) pieces in Chinese language and culture. Therefore, by applying the oblique translation technique (i.e. adaption) the more suitable translation is ‘dextrose pills/tablets’ (葡萄糖药片). The phrase ‘pills/tablets’ (药片) is purposely chosen here as it is often eye-catching to a target audience that is more willing to pay extra attention to medications. In Chinese health culture, clinical information including medical treatments always sit on the top of their cultural belief hierarchy. As a result, the alternative translation can promptly and correctly convey the intended usage of the treatment here, which makes the information easier to understand and learn.

Additionally, there were mistranslations presented in the expression ‘ketones are presented’. Two parts of this sentence are inaccurately translated. The first part is word ‘ketones’ that turns out into such a medical jargon through the literal translation technique. The translation of ‘ketone’ into its chemistry special noun (酮类化合物) is very difficult to comprehend even in the readers’ own language (see Table 4.9 for details). The second part of this sentence is the translation for ‘present’. In the medical context (esp. in pathology), ‘present’ has subtly changed from its common meaning of being ‘existence’ (存在) to being in a positive status (阳性) (see Table 4.9 for details). Hence, the suggested translation ‘positive status’ (阳性) has conveyed the information into a more readable and simpler phrase.

Conclusion

Language style, the tone and the choice of words have a powerful influence on the readership, in particular on a patient’s self-confidence, health literacy and motivation for self-management in chronic diseases. Diabetes Australia in its position statement for ‘A New Language for Diabetes’ highlights the importance of languages used in diabetes education (2016a): Language has the power to persuade, change or reinforce beliefs, discourse and stereotypes – for better or for worse. Words do more than reflect people’s reality: they create reality. A good health translation should translate at the semantic level, rather than word for word, and in a culturally sensitive way adapting the original text to the cultural and linguistic requirements of the target language.

Our research shows that quality health translation should preserve the content and the meaning of the original text, while making necessary textual adaptations given the important cultural and linguistic gaps between the source and the target languages. Moreover, health translations need to be natural and accessible for readers to understand and use in their everyday life. Using the POCA health translation model, we found that the translation of many linguistic issues in the sample material clearly needed further revision. Examples of ineffective cultural and
linguistic adaption include negative, careless or excessive usage of honorific expressions. These showed why the material failed to facilitate much-needed psycho-behavioural changes. The use of the POCA model successfully demonstrated how health translation can affect the readability of health education materials, making comprehension more challenging to readers with low health literacy.

Our case study highlighted how the POCA health translation model can apply health literacy principles and a patient-centred education philosophy to practical health translation assessment. The result of our analysis calls for urgent improvement of the current health translation of diabetes education materials in Australia which needs to become the priority in any future bilingual health material development and revision. This move can also bring about long-term, positive health effects such as improved self-management, reducing healthcare costs in Australia, as well as health inequalities among socio-economically disadvantaged social groups and communities.

Our case study showed that to achieve quality health translation, cross disciplinary collaboration between translators and health/medical professionals is in order when developing any future bilingual education materials. Our research urges Diabetes Australia and National Diabetes Service Scheme to work together with translators, health professionals and the target audiences and communities to address their specific socio-cultural and linguistic needs to ensure translated materials are easy to understand. Our study provided an opportunity for health translators to start thinking about how to improve their competence in culture and health translation.

In health translation, translators need to increase their professional capacity and knowledge required for this highly specialised profession. The basic professional qualities of health translators include a good understanding of the disease conditions, and sometimes more importantly, the health literacy levels, cultural beliefs and reading habits of the target audience. Health translators can pitch the original text in the target language at the suitable health literacy level, using the translator’s comprehension of the health education setting. For further professional development, forums where people working on health literacy related research and linguistics could meet, discuss their work and share their experiences of addressing health literacy are another important and useful way for effective collaboration.

For educational organisations and universities, health literacy training curricula should be incorporated into the translation courses for undergraduates and postgraduates. An integrated health translation training programme for professional translators will enable them to collaborate with health professionals to better implement health translation principles. Such collaboration will help resolve the translation challenges analysed above and provide strong support for the development of clear, user-friendly, and culturally and linguistically appropriate patient information materials to enable optimal patient understanding and improved health outcomes.