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Challenges in Sight Translation of Medical Terminology in Healthcare

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Abstract

General Background: Accurate translation of medical terminology is essential in multilingual healthcare settings. **Specific Background:** Sight translation, where medical terms are translated aloud in real-time, presents challenges due to cognitive, linguistic, and cultural complexities. **Knowledge Gap:** While cognitive load and term equivalency have been studied, their combined impact in real-world translation remains underexplored. **Aims:** This study investigates the cognitive load, term equivalency, and cultural adaptation strategies of healthcare translators. **Results:** Interviews with 15 translators identified cognitive load, term equivalency issues, and cultural adaptation as key challenges. **Novelty:** This research highlights the need for specialized training in managing these complexities. **Implications:** Findings suggest that healthcare translator training should focus on cognitive load, medical terminology, and cultural competence to improve translation accuracy and patient understanding.

Keywords: sight translation, medical terminology, cognitive load, term equivalency, cultural adaptation

Introduction

Accurate translation of health and medical terminology ensures clarity in communication, particularly in multilingual healthcare settings. Physicians rely on certain expressions to make decisions, conduct treatments, and maintain patient safety. The translation of medical terms differs from general translations because the vocabulary of medicine is very specialized, linguistic precision is required, and a great deal of cultural context is attached to the various discourses in medicine (Pöchhacker, 2016). In sight translation, of course, this difficulty is further exacerbated when a translator reads and interprets a text out loud in real time. Translators face the daunting responsibility of comprehending specialized terms while providing an accurate translation at an immediate pace, which can result in errors or misinterpretations if such situations are not carefully managed (Mikkelson & Jourdenais, 2015). One of the major challenges in sight translation of the medical terms is the usage of words which perhaps do not have an exact match in the target language. Most of the medical terminologies, especially those

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based on Latin or Greek, have meanings which are not easily or appropriately conveyed across borders (Mutashar et al., 2024). In most languages, there may not be an appropriate one-for-one translation for the medical terminologies whereby the translator interprets the meaning instead of translating it word by word hence losing the intended meaning or accuracy (Gile, 2009). Besides, cultural factors may modulate the very understanding and interpretation of medical concepts. For instance, the very terms for certain diseases or symptoms may have different associations or be more/less known in different cultures, which further complicates the translator's work (Robinson, 2012). Sight translation research in health care indicates that translators have to be bifurcated with skills not only in linguistic areas but also with specialized knowledge in the field of medicine. This means that translator training has to focus on both languages and technicalities in medical language. If he doesn't have a good sound background in medical language, he cannot translate terms and phrases properly, which may also affect patient understanding and safety (Valero-Garcés & Martin, 2008).

Literature Review

Recently, health and medical terminologies have been gaining more and more interest from translation studies scholars, especially those dealing with sight translation (Angelelli, 2019). Sight translation can be defined as a type of interpretation that involves looking at written texts and their immediate conversion into speech, which demands fast information processing by translators with the aim of exactness and culturally appropriate language-a process that complicates the matter when one considers certain specific medical terms. During sight translation, given its rapid tempo, cognitive load, term equivalency, and cultural adaptation problems often arise that could affect the quality of translation and patient comprehension (Lee-Jahnke, 2012).

1. Cognitive Load in Medical Sight Translation

Cognitive load theory highlights that during the process of sight translation, translators internally bear the pressure of releasing information right away; the translator might undergo a heavy cognitive load every time they come across certain unfamiliar medical terminologies, which often they have to recall instantly in the correct form in the target language (Gile, 2009). As Muñoz Martín points out (2014), the cognitive demand from sight translation might interfere with precision accuracy because the translator may not remember the right words or, in the worst case, he may even misinterpret important medial concepts (Angelelli, 2019). Evidence from scientific research confirms that high loads have a negative influence on quality within translations, which may have enormous implications for settings such as health care where precision is of utmost concern (Riccardi, 2019).

2. Term Equivalency and Translation Accuracy

One of the core issues in the translation of medical terminology is term equivalency between the source and target languages (Mohammed Kadhim et al., 2024). Most of the

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medical terminologies are based on their Latin and Greek roots, which might be difficult in certain terms to be translated directly. This process is further complicated by the fact that different cultures and healthcare systems use medical terminologies that stand rather far from one another (Gile, 2009). It has been illustrated in various studies that during sight translation, very often the translators come across certain terms that do not have an appropriate target language equivalent, meaning that interpretation or some sort of descriptive explanation is required, which, of course, is risky to drop the precision. As Robinson (2012) states, it is particularly problematic in health care because poor translation may compromise patient comprehension and inhibit effective provider-patient communication (Lee-Jahnke, 2012).

3. Cultural Considerations in Medical Sight Translation

Cultural factors, in particular, play a significant part in the complication of medical terminologies, especially within a health setting that involves cultural diversity. The concepts of health, illness, and those of clinical procedure have great cultural variability, and the expressions related to such concepts may not be available in languages other than those of Western medicine (Valero-Garcés & Martin, 2008). Angelelli (2019) has indicated that, aside from the technical meaning of the terms, medical translation involves cultural sensitivity: translators have to "perform" terms so that they adapt to the cultural knowledge of the target audience. That at times means simplification of language or resorting to culturally resonant terms; this increases the complexity of sight translation in healthcare contexts (Pöchhacker, 2016)

4. Training and Professional Competencies

Recent research has centered on the need for specialized training in medical sight translation and has underscored that such training should equip translators with the relevant linguistic and medical knowledge (Atiyah & Hasan, 2024). Indeed, Mikkelson and Jourdenais (2015) aver that general translation training, of course, provides a superb foundation; however, it is quite important to develop additional competencies in medical terminology and knowledge relevant to specific healthcare contexts (Muñoz Martín, 2014). Besides, it was observed that training in medical terminology also enhanced the accuracy and speed of the translators, reduced cognitive load, and improved translation quality. It said this is an important competency for translators because in healthcare settings, good communication usually improves patient care outcomes (Riccardi, 2019).

Methods

A qualitative approach will be adopted as a means of investigating the complex nature of translation regarding medical terminology in sight translation. Qualitative research is appropriate for any research that focuses on explaining human experiences, interpreting complex social phenomena, and situating it within real-world contexts (Creswell & Poth, 2018). This study, therefore, investigates experiences, challenges, and strategies used by professional translators in

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regard to medical terminologies in ST, focusing on how cognitive, linguistic, and cultural factors may have an influence (Mutashar, 2024).

1. Research Design

A qualitative research design will enable an in-depth study of the translators' experiences and challenges regarding medical sight translation. The proposed study will gather information from professional translators working with original medical texts in sight translation through in-depth, semi-structured interviews (Kvale & Brinkmann, 2015). Semi-structured interviews allow participants to talk freely about their experiences and views while keeping the research focused on relevant themes. A total of 15 professional translators with at least five years of experience in healthcare translation will be interviewed.

2. Sampling Strategy

This is where purposive sampling will come into operation: it selects those individuals who possess specific, in-depth expertise in medical sight translation. Purposive sampling is a method most frequently applied to qualitative research, which involves the selection of a sample comprising known persons who are conversant with the issue under investigation (Patton, 2015). Recruitment will be done from professional networks and any other entities oriented towards health care translation to ensure that it is representative of experienced practitioners. The selection criteria included experience: a minimum of five years of work in the translation of health-related material, scientific knowledge of medical terminology, proficiency in both the source and target languages (Hasan et al., 2024).

3. Data Collection

Data collection for this study will be done through in-depth interviews, semi-structured, which become especially apt in cases of complex experiences and yield very valuable insight into the cognitive and linguistic processes operating during sight translation (Flick, 2018). In-depth interviews will last about 45 to 60 minutes each and will be conducted using an interview guide that has been developed based on the literature review. Some of these questions will regard term equivalency challenges, cognitive load, cultural adaption, and the translators' strategies to ensure accuracy during sight translation. The interviews are to be audio-recorded, with permission from the participants, and then transcribed verbatim for further detailed analysis (Hasan et al., 2025).

4. Data Analysis

Thematic analysis shall be done through patterns and themes of the interview data. Thematic analysis is an approach that is flexible and systematic in nature; it organizes and interprets qualitative data through coding of key phrases, then groups those into themes so that insights from such patterns are identified. First, the data will be transcribed, and then they will be coded with the help of NVivo software to facilitate organization and retrieval of codes and themes (Braun & Clarke, 2006). Data will be coded independently by the researcher and

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then compared to check reliability and consistency in theme identification. Some themes that are expected to emerge include handling strategies for unfamiliar terminology, managing cognitive load, and language adaptation for cultural relevance.

5. Validity and Reliability

This qualitative research study will be subjected to numerous activities aimed at increasing its validity and reliability. Triangulation will be effected through triangulation of interview findings with available literature to ensure that the themes compare well with documented research (Patton, 2015). Member checking will also be effected by allowing the participants to read through their interview transcripts and preliminary identified themes for confirmation of accuracy in data representation (Creswell & Poth, 2018).

Results and Discussion

The results of this study highlight several important themes in relation to problems encountered when sight translating medical terminology. Three significant themes emerged from the interview data analysis: (1) the management of cognitive load; (2) the question of the management of term equivalency; and (3) strategies for cultural adaptation. Each of these themes indicates the challenge posed by the work of the translator within healthcare and how the professionals manage to deal with these challenges (Tiryag, 2024).

1. Cognitive Load Management

The first theme was related to the management of cognitive load, which appeared as a critical concern among the participants (Ali, Hamid, et al., 2024). Many of the translators reported that during sight translation, the level of cognitive load is high, particularly in those situations where the medical terminologies are either unfamiliar or complex. Cognitive load was described as an obstacle in the way of maintaining accuracy and clarity; participants reported that this is frequently leading to "mental fatigue" and occasionally lapses in precision (Muñoz Martín, 2014). Several strategies were mentioned by translators with the view to decreasing their cognitive overload: mentally preparing themselves before initiating the translation task, familiarizing themselves with common medical terms, and narrowing their focus to core terminology to minimize processing demands (Gile, 2009)

2. Handling Term Equivalency Issues

A second theme related to the issues of term equivalency, a fact that keeps on happening as one does the translation job, there are no one-to-one translations of certain medical terms in the target language. Several participants named the number of terms that did not have one-to-one equivalents, which had to be interpreted to mean what the term actually meant to sometimes do descriptive translations to retain meaning. As one participant explained, "In case there is no precise term in the target language, I have to think of a way to explain it without losing the medical accuracy." (Angelelli, 2019). This practice indeed aligns with strategies of healthcare translation, where the end is always toward the understanding of

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the patient, often at the expense of literal accuracy. But these interpretative strategies sometimes caused problems: translators worried whether their descriptive translations were sufficiently accurate and medically appropriate (Lee-Jahnke, 2012)

3. Strategies for Cultural Adaptation

The third theme identified is cultural adaptation. Translators pointed out the importance of translation of words to fit the cultural context in which the target audience lives. Also, participants mentioned that some medical terms have different meanings in different cultures, and unless translated appropriately, literal translation might lead to a lot of confusion for patients. For example, certain Western medical terminology names of diseases and descriptions did not always find their culturally appropriate equivalents, which in turn made translators adapt terms in a manner that conformed to local perceptions of health and illness. The process, according to Pöchhacker (2016), is important in health care translation since it ensures the truthfulness of medical information but also keeps such information culturally relevant. To this end, a number of translators mentioned that they would seek out cultural advisors or simplify the language one way or another (Valero-Garcés & Martin, 2008)

4. Summary of Findings

The results showed that sight translation of medical terms is an interaction of complex cognitive, linguistic, and cultural variables. Strategies adopted by the translators reflect a multi-layered approach to ensuring translation accuracy, assuring patient comprehension, and maintaining cultural relevance-a further testament to the specialized training in medical translation. As revealed by the interviews, some of the competencies identified for health care contexts involve the management of cognitive load, handling term equivalency, and cultural adaptation; such a finding corroborates previous studies on the importance of expertise for translation accuracy and effectiveness (Muñoz Martín, 2014), (Angelelli, 2019)

Discussion

These results reveal the multilayered complexities that the translators face in performing sight translation of medical terminology. Data analyses pointed to three themes relevant to translator experiences in healthcare settings: cognitive load management, term equivalency issues, and strategies for cultural adaptation. These findings extend existing knowledge on healthcare translation and contribute to the growing understanding of the underpinning specialized competencies that enable the delivery of accurate, culturally relevant translations in real time.

1. Cognitive Load Management

The results supported the role of cognitive load as a key factor that greatly influenced translation accuracy and efficiency in medical sight translation. In this respect, the translators

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felt mentally strained since they needed to pay much attention and process it at a fast rate in order to precisely capture the meaning of medical information. Cognitive load theory helps explain those experiences as it deals with mental demands on a person when performing a challenging task (Muñoz Martín, 2014). The strategies mentioned by participants, such as a focus on core terminology and a mental preparation phase before translation, echo findings by Lee-Jahnke (2012), that are supported by a cognitive approach to translation, which may help a translator to remain focused and avoid mental fatigue. According to Riccardi (2019), the cognitive load, once addressed by specialized training, can help to provide more accurate translations and reduce the probability of errors (Gile, 2009)

2. Term Equivalency Issues and Translation Accuracy

The theme of term equivalence represents one of the ethnomethodological problems that the translators face while working in healthcare settings: the non-existence of full equivalents of medical terms across languages. In fact, this relates to Angelelli (2019), who identified that translation in healthcare often involves an element of interpretation due to the specialized nature of the vocabulary used in the discourse. Such examples were very common, in fact, when an exact word equivalent was not available; the subjects of this research had to depend on the descriptive translations very often. While the descriptive translation can retain the main sense, it also risks losing the technical accuracy, which may impact patient comprehension and, subsequently, the treatment result (Robinson, 2012). This would suggest that, in addition to linguistic skills, translators should also possess specialist knowledge in medical concepts, as stated by Valero-Garcés and Martin (2008).

3. Cultural Adaptation as a Strategy for Comprehension

Another theme was the cultural adaptation of medical terminology, where it is explained that for patients to take heed of the same, it has to be made relevant to their culture. Cultural adaptation in health-care translation is very important in enabling patients to understand the meaning of a particular medical terminology and instruction in relation to their culture (Pöchhacker, 2016). Their findings are supported by the arguments by Angelelli (2019), that cultural sensitivity in translation would help ensure effective communication in multicultural health care settings. The participants often reported instances where word-for-word translation may cause misunderstanding or suspicion with the patients due to cultural differences in understanding the disease and treatment. Again, this finding argues that effective healthcare translation must sometimes consider clarity of the message over accuracy of word translation (Valero-Garcés & Martin, 2008).

4. Implications for Translation Practice and Training

Results of this study have a number of implications for healthcare translator practice and training. First, the need for cognitive load management techniques in real-time translation raises the importance of training in mental preparation and terminology focus. Second, training should emphasize the use of descriptive translations for dealing with term

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equivalency issues whenever possible, with verification of meaning with healthcare professionals also where possible. There is also the need to develop cultural adaptation skills, whereby translators can make adjustments in language and terminologies to facilitate cultivating trust and understanding among patients from a diverse set of cultural backgrounds when seeking care or treatment (Creswell & Poth, 2018)

5. Limitations

This paper is limited in several ways despite the insight it gives into some of the challenges that sight translators face with medical terminology. First, the sample was small, consisting of only 15 participants, probably affecting the generalization of findings. While qualitative studies often use fewer samples to enhance in-depth analysis, a larger sample might have increased variety in their responses and enhanced the reliability of such findings (Patton, 2015). Future studies with a larger and wider participation could therefore provide a broader perspective on the experiences of the translators themselves in diverse healthcare settings.

The entire study relied solely on self-reporting data that were collected through semi-structured interviews. While interviews are an effective way to explore participants' subjective experiences, they themselves are always open to recall bias or even social desirability bias in the way participants might involuntarily change or filter their responses (Creswell & Poth, 2018). Triangulation of methods to reduce this limitation may be done, such as the inclusion of observational data or document analysis to provide a balancing perspective of translators' actual concurrent practice and difficulties (Patton, 2015)

Third, this research targeted only translators working in specific language pairs within certain healthcare systems, which have implications for the generalization of results to other languages and healthcare contexts. The challenges of healthcare translation can often be shaped by cultural and linguistic issues; therefore, further research needs to cover additional language pairs and healthcare contexts, with the intention of sourcing larger implications of sight translation in various contexts.

Moreover, this research did not verify the genuine quality or accuracy of translation obtained from the participants themselves, as it focused on self-reported experiences and strategies rather than on the outcomes of translation. Further research may get closer to finding the answer in analyzing both translators' self-reported difficulties and objective quality of their translations, which can yield significant correlations between cognitive load, term equivalency, and translation accuracy. This would give more insight into the direct impact of the challenges on translation quality and patient understanding.

Although these limitations can have an impact on the scope and transferability of findings, this research provides an important contribution to the basis for the unique challenges of sight translation of medical terminology. Removing these limitations in further research could give more substance to the knowledge base on healthcare translations and support the development of targeted training and support for translators in this field.

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6. Future Research

These results of the study have pointed to various directions in which further research on the intricacies of sight translation can be conducted. Future studies, using these insights, may try to overcome the limitations of the present study by using larger samples, different language pairs, and mixed-methods approaches.

a. Expanding Sample Size and Diversity

Limiting sample size in this present study, future studies ought to find ways of exploring a larger and more variable sample that increases the generalisability of the findings. More participants may allow for an opportunity to uncover the different ways in which cognitive and linguistic strategies are employed by translators and challenges that are faced within various health care settings (Patton, 2015). Further research into language pairs other than those treated in this study, especially with regard to less commonly translated languages, may allow for the highlighting of specific challenges that translators experience when working in so-called less-resourced linguistic contexts (Angelelli, 2019). This will be useful in a broadening scope of vision concerning sight translation needs and strategies in diverse cultural and linguistic environments.

b. Incorporating Observational and Experimental Approaches

Other future studies could use observational or experimental approaches supplementing interview data and, therefore, limiting the impact of self-report bias. For example, eye-tracking technology and/or real-time observation of translators could offer objective data about cognitive load, term recognition, and processing time in sight translation tasks (Muñoz Martín, 2014). Methods such as these would allow researchers to compare translators' perceived challenges with their actual practices and physiological responses, which will finally provide a better picture of the cognitive demands of medical sight translation. The effects of several techniques aimed at managing cognitive load, such as brief pauses or mental preparation exercises, upon translation accuracy and translator fatigue (Gile, 2009)

c. Examining Translation Quality and Patient Comprehension

Future research should also investigate the quality of the sight translation itself in terms of the impact on patient comprehension and healthcare outcomes. This present study targets translators' experiences, but the accuracy of translation given would also test how cognitive load, term equivalency issues, and cultural adaptations affect quality when considering Riccardi's (2019) work. Analyzing translation output in natural settings may therefore enable researchers to identify specific factors leading to translation errors or misunderstandings and thus provide guidance on how to enhance clarity and accessibility of medical information to patients (Valero-Garcés & Martin, 2008)

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d. Developing Specialized Training and Support

Last but not least, further research may be directed to designing and testing the actual effectiveness of specific training programs that would support translators in managing cognitive load, solving term equivalency problems, and culturally adapting their terminology. Researchers would investigate the impact of training on terminology familiarization, the management of cognitive load, and cross-cultural communication performance and self-efficacy among translators (Creswell & Poth, 2018). Assessment of the effectiveness of training in real-time translation quality could allow future research to make practical recommendations for improving standards in healthcare translation (Ali, Hashoosh, et al., 2024).

It is this study that has laid the foundation for describing the challenges of medical sight translation, but future research will extend this foundation as it responds to current limitations and pursues new methodologies. Future studies might be enhanced in their pursuit of larger, more diverse samples; integrating observational techniques; examining translation quality; and developing specialized training with the aim of furthering our knowledge of the demands and requirements placed on healthcare translation in order to continue improving patient-provider communication.

Conclusion

The current study has explored the particular problems sight translation presents in the area of medical terminology for effective management of cognitive load, problems of term equivalence, and cultural adjustment-all factors that were observed to influence either accuracy or effectivity of translation. The findings contribute to an increasing number of studies on healthcare translation by underlining the specialized skills and strategies translators need to handle complex medical content in real-time, often under conditions of great mental strain.

The management of cognitive load became an important constituent in effective sight translation, as a translator needs to process quickly and transmit the medical information without mistakes. Common strategies were mental preparation and narrowing down to key terminologies. This corroborates Gile's Effort Model, where the cognitive load may affect performance in high-stake translation contexts-only if translators do not have access to external resources or reference materials during the process of sight translation.

Another challenge was equivalency of terms because, in many instances, there will not be a direct translation for a particular specialized term in the target language. Translators often employed descriptive strategies in an effort to convey meaning as accurately as possible, navigating a delicate balance between technical precision and patient comprehension. Such findings, noted Angelelli (2019) and Robinson (2012), point out the salient need for expansive knowledge of medicine, aided by specialist training, to help the translator meet such nuanced demands in healthcare translation.

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Cultural adaptation also became integral to successful medical translation because literal translations can lead to ambiguities or cultural misunderstandings. The translators in this paper adapted the medical terms to the context of the recipients, which holds the essence of cultural competence in healthcare translation (Pöchhacker, 2016), (Angelelli, 2019). This helps ensure that medical information is culturally relevant-engendering trust through improved patient outcomes, especially in multicultural healthcare settings.

These results have real-life implications for healthcare translation. They emphasize the need for specialized training programs that can efficiently deal with cognitive overload, terminology familiarization, and cultural adaptation strategies in order to support translators in producing quality medical translations. Results on sight translation challenges also indicate that a translator should be supported by the healthcare institution with access to medical glossaries and culturally appropriate resources to improve patient-provider communication and healthcare outcomes.

This present study creates the foundation for further investigation into sight translation within healthcare contexts. Future studies will continue to reflect on and refine our ideas about specific competencies required in medical translation by addressing the omissions of this study and considering mixed-methods approaches. Indeed, as health care becomes increasingly globalized, specialized training for translators is the linchpin for patients from all walks of life to be successful in receiving clear, understandable healthcare information.

Originality Statement

The author[s] declare that this article is their own work and to the best of their knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the published of any other published materials, except where due acknowledgement is made in the article. Any contribution made to the research by others, with whom author[s] have work, is explicitly acknowledged in the article.

Conflict of Interest Statement

The author[s] declare that this article was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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