Pacific International Journal, Vol. 7(5); 2024
ISSN (Print) 2663-8991, ISSN (Online) 2616-4825[1]
DOI: 10.55014/pij.v7i5.717
https://rclss.com/index.php/pij

The Construction of Ethical Norms for Translation Technology for Medical Translators

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Abstract: This study explores the construction of ethical norms for medical translators who use translation technologies such as Machine Translation (MT), Neural Machine Translation (NMT), and Computer-Aided Translation (CAT) tools. As these technologies become integral to medical translation, ethical concerns surrounding accuracy, confidentiality, and humanitarian considerations arise. The study emphasizes the importance of maintaining a balance between the efficiency of technology and the ethical imperatives that define medical translation. Using a mixed-methods approach, including literature review, comparative analysis, and textual evaluation, the study investigates the ethical challenges posed by translation technology. It proposes ethical norms focusing on human oversight, data security, empathy, and accountability. The findings suggest that the role of the translator is evolving, requiring not only linguistic expertise but also competence in navigating the ethical complexities introduced by technology. The research contributes to the development of actionable guidelines that ensure the responsible use of translation technology while preserving the core values of medical ethics.
Keywords: medical translation, translation technology, ethical norms, machine translation, confidentiality, data security

1. Introduction

1.1 Background of Translation Technology in Medical Translation

In today's interconnected world, technology has transformed how people communicate across languages and cultures, and medical translation is no exception. With the rise of digital tools and the growing need for quick and accurate communication in healthcare, translation technology has become a vital part of medical translation practices. Tools like machine translation, neural networks, and computer-assisted translation (CAT) systems have brought unprecedented speed and convenience, making it easier for translators to handle large volumes of medical information and ensure that patients across the globe have access to healthcare knowledge [1]. These advances have made it possible for medical information to be shared more widely and quickly than ever before, enabling collaborative research and improved patient care around the world [2].

However, with these technological advances come ethical concerns, particularly in a field as sensitive as medical translation, where precision and empathy are paramount [3]. Medical translators are not just conduits of scientific information; they carry the responsibility of conveying the compassionate and human-centered values of medical care. Relying too heavily on technology without considering its limitations can strip medical communication of its essential human touch. This creates a complex challenge—how do we embrace technology's benefits while ensuring that it doesn't undermine the trust, accuracy, and empathy that are so crucial in healthcare communication? Therefore, developing ethical guidelines to manage the use of translation technology is critical, both to protect the integrity of medical translation and to ensure that humanistic care remains at the heart of the process [4].

1.2 The Need for Ethical Norms in Translation Technology

As translation technology becomes more widespread, the need for clear ethical guidelines becomes increasingly urgent, particularly in fields like medical translation, where the consequences of errors can be serious. Medical translators handle sensitive content, such as patient instructions and clinical trial reports, where even the smallest mistake can have significant consequences. Beyond accuracy, translators must also ensure that the values of empathy and patient care, so integral to medical practice, are reflected in their translations.

When used without sufficient ethical oversight, translation technology can reduce these important human elements to impersonal technical outputs, leading to a loss of trust between healthcare providers and patients. Ethical norms are necessary to ensure that translation technology is used in a way that complements the translator's role in maintaining both the technical and humanistic dimensions of medical care. Such guidelines will help translators use technology responsibly, enhancing the quality of their work rather than diminishing it.

1.3 Research Gaps in Translation Ethics for Medical Translators

Despite the increasing use of translation technology, the ethical challenges it presents—particularly in medical translation—have yet to be fully explored. Much of the existing research on translation ethics has focused on general translation practices, leaving a gap when it comes to the specific needs and challenges of medical translators. Additionally, the development of ethical guidelines for the use of translation technology by medical translators is still in its early stages, especially in many countries where such standards are not yet established.

[Received 17 July 2024; Accepted 19 October 2024; Published (online) 20, October, 2024]

This gap points to the need for more in-depth research into how translation technology affects medical translators, particularly when it comes to balancing efficiency with the ethical duty of providing compassionate care. It also underscores the importance of developing actionable guidelines that can help medical translators navigate the ethical complexities they face in a rapidly evolving technological landscape.

1.4 Objectives of the Study

This study aims to address the ethical challenges that arise from the use of translation technology in medical translation. The specific objectives are:

- To define the ethical implications of using translation technology in the context of medical translation.
- To identify key principles that should guide the development of ethical norms for medical translators using technology.
- To create practical and effective ethical guidelines that will help medical translators use technology responsibly, while ensuring the quality and integrity of their work.

1.5. Significance of the Study

The construction of ethical norms for medical translators is essential to ensuring that translation technology is used responsibly in this highly specialized field. Ethical guidelines not only help to elevate the professionalism of medical translators but also foster the growth of a competent, ethically conscious workforce. By raising awareness of the risks associated with translation technologies, this study aims to help medical translators understand how to approach these tools with a clear, rational mindset. This understanding will help minimize errors, uphold ethical standards, and ensure that technology enhances rather than undermines the quality of medical translations.

In addition to establishing clear ethical guidelines, this study will provide medical translators with practical tools to navigate the ethical challenges they encounter as technology continues to advance. These norms will ensure that translators can seamlessly integrate technology into their workflows without sacrificing important values like accuracy, confidentiality, and compassion. As the translation industry continues to evolve in response to digitalization and innovation, this study will play a crucial role in refining ethical standards, supporting innovation, and ensuring that medical translation remains responsive to the technological advancements shaping the future of healthcare.

2. Theoretical Framework and Literature Review

2.1 Ethics in Translation Studies

Translation ethics has evolved as a critical component of translation studies, particularly with the growing complexity of global communication and the increasing reliance on technology. Ethics in translation can be broadly defined as the moral principles that guide translators in their professional conduct, including the responsibility to provide accurate and culturally sensitive translations. Antoine Berman, in the 1980s, introduced the idea of "ethical responsibility" in translation, arguing that translation is an act bound by moral considerations [9]. This concept has since been expanded by scholars like Lawrence Venuti, who emphasized the importance of preserving cultural differences through the ethics of "foreignization" in translation [10]. Andrew Chesterman also contributed significantly to translation ethics by proposing four types of norms—expectancy, relation, communication, and accountability—that translators should adhere to in order to uphold ethical standards [11].

Chinese scholars have gradually recognized the importance of ethics in translation. The work of Ren Wen, for instance, finds the ethical challenges posed by machine translation and the guiding principles for human-machine interactions in translation [5]. Lyu Jun explored ways to apply ethical theories, such as communicative action theory, to translation practices in order to ensure ethical conduct in intercultural translation activities [6].

2.2 Ethical Issues in Translation Technology Application

The application of translation technology, while transformative, has introduced several ethical issues that require careful consideration. Machine translation (MT), computer-aided translation (CAT) tools, and other digital technologies have significantly improved the speed and efficiency of translation processes. However, these tools can also lead to ethical challenges such as reduced human oversight, diminished quality, and cultural insensitivity if used improperly. Researchers like Michael Cronin have explored these challenges in his work Translation in the Digital Age, highlighting the ethical dilemmas that arise from the over-reliance on machines in translation tasks [12]. Hao Junjie contributed to discussions on the ethical implications of crowdsourced translation and its potential to degrade the quality of translations when ethical standards are not enforced [7]. Lan Hongjun has addressed the broader ethical considerations of translation technology, emphasizing the need for translators to understand both the benefits and limitations of these tools to avoid ethical pitfalls [8]. Additionally, Ren Wen has outlined the human-machine relationship in translation and the ethical challenges that arise from the use of increasingly autonomous technologies in translation processes [5].

2.3 Medical Translation: Challenges and Ethical Considerations

Medical translation is one of the most ethically sensitive areas in translation due to the life-and-death implications of medical information. Medical translators are responsible not only for ensuring the technical accuracy of their

translations but also for conveying the humanistic elements of medical care, such as empathy and patient confidentiality. This dual responsibility presents unique challenges, particularly when translation technologies are involved. The integration of machine translation in medical contexts can lead to risks such as loss of context, misinterpretation of medical terminology, or culturally inappropriate translations, which could have serious consequences for patient care [13] [15].

In recent years, various studies have highlighted the pressing ethical considerations in medical translation. For instance, Molchanova and Sokolova [16] examined the translation of medical instructions and the critical importance of maintaining safety and efficacy in pharmaceutical communication. Their work emphasizes that translators must navigate complex ethical waters to ensure that translated materials do not compromise patient safety. Furthermore, Muñoz-Miquel et al. [17] discussed the need for specialized education in medical translation, which fosters ethical awareness and adaptability among translators. This training is crucial as it equips translators with the skills to handle the intricate ethical challenges posed by emerging technologies in medical settings. In addition, Sezgin et al. [18] proposed a mobile app aimed at assisting non-English-speaking caregivers, addressing ethical concerns related to accessibility and communication in healthcare. By leveraging technology, they aimed to enhance understanding and support for vulnerable populations while emphasizing the necessity for translators to maintain ethical standards.

Moreover, the increasing reliance on machine translation tools in the medical field raises significant ethical dilemmas. Cambedda et al. [19] conducted a comparative analysis of machine translation errors in medical texts, underscoring the potential risks associated with automated translations in this sensitive domain. Their findings highlight the importance of human oversight to mitigate risks to patient care. Additionally, Keles et al. [20] introduced the concept of integrating small AI models in biomedical translation, which can further complicate ethical considerations as they relate to accuracy and cultural sensitivity. As these technologies evolve, it is imperative for medical translators to develop ethical frameworks that address both the benefits and limitations of technological interventions [21].

In China, there is a growing recognition of the need for more specific ethical guidelines for medical translators. Scholars such as Han Lintao have called for the establishment of ethical principles that reflect the unique demands of the medical translation field, particularly in terms of the impact of translation technologies on patient safety and confidentiality [14]. Despite these efforts, research on translation technology ethics in the medical field remains underdeveloped, and there is an urgent need for more targeted studies to address these gaps.

3. Methodology

3.1 Research Methods

To construct ethical norms for medical translators, three primary research methods are employed: literature review, comparative analysis, and textual analysis.

The literature review systematically investigates existing research, highlighting both historical perspectives and contemporary challenges regarding ethical norms in medical translation as influenced by technology. Key sources include academic journals, ethical guidelines from translation associations, and case studies showcasing current trends in technology use among medical translators, with the goal of identifying gaps in ethical frameworks that warrant attention. Additionally, comparative analysis contrasts ethical guidelines across various fields, such as medical ethics, legal translation, and technical translation, to uncover common principles adaptable to medical translation. This method offers insights into the unique ethical challenges faced by medical translators, particularly in balancing accuracy and humanistic care with technological efficiency. Textual analysis complements these methods by examining case studies of medical documents translated with technology, revealing where ethical breaches or errors may have occurred. This approach not only sheds light on the practical implications of existing norms but also emphasizes the need for specific ethical guidelines tailored for medical translators, while assessing differences in accuracy, empathy, and patient confidentiality between machine-generated and human translations.

3.2 Data Collection and Analysis

The study employs a mixed-methods approach for data collection, integrating qualitative insights from various sources to gain a comprehensive understanding of the ethical challenges in medical translation technology. The data collection process begins with an extensive literature review of peer-reviewed academic articles, ethical guidelines from medical translation associations, and reports on technology application in translation, providing a theoretical foundation and highlighting current gaps in ethical practices. This is complemented by the examination of case studies drawn from academic literature and the professional experiences of translators, focusing on real-world scenarios where machine translation tools were employed to reveal practical challenges and dilemmas. Semi-structured interviews with experts—medical translators, healthcare professionals, and translation technology developers—offer firsthand accounts of the ethical issues encountered in daily medical translation, deepening the understanding of technology integration in this sensitive field. For data analysis, thematic analysis is applied to qualitative data from interviews and case studies to identify key themes such as accuracy challenges, confidentiality concerns, and the necessity of humanizing machine-generated translations. This process allows the study to pinpoint critical areas where ethical guidelines need strengthening. Comparative data analysis further examines ethical

guidelines from high-stakes fields like legal and technical translation, providing a framework for constructing norms tailored to medical translators. Additionally, textual evaluation assesses translated medical documents, comparing machine-generated translations with human translations to evaluate accuracy, context preservation, and the maintenance of humanistic values.

3.3 Feasibility and Limitations of the Study

This study is feasible due to the availability of resources, access to professional translators, healthcare professionals, and existing literature on translation ethics and technology. Interviews with medical translation professionals and technology experts are readily attainable, and documented case studies highlight the use of translation technology in medical contexts. The extensive literature on translation ethics provides a strong foundation for analysis, allowing for comparative studies with other high-stakes translation fields. However, the study's limitations include a reliance on secondary data for case studies and textual analysis, which may restrict insights into real-time translation cases with complex ethical dilemmas. Additionally, cultural variations in medical translation ethics might not be fully addressed, as ethical norms differ across regions and healthcare systems. The rapid evolution of translation technology also poses a challenge, as ethical issues may shift with advancements in machine learning and artificial intelligence. Despite these limitations, the study is well-positioned to contribute significantly to developing actionable ethical norms for medical translators, grounded in real-world challenges and theoretical insights that support the creation of comprehensive and practical ethical guidelines.

4. Ethical Dilemmas in the Use of Translation Technology by Medical Translators

As technology continues to reshape the landscape of medical translation, a range of ethical dilemmas has emerged. While technological tools provide many advantages, they also raise significant ethical concerns that challenge the translator's responsibility to maintain accuracy, confidentiality, and patient care. These dilemmas revolve around the balance between technological convenience and the ethical imperatives of maintaining the integrity, empathy, and precision required in medical translation.

4.1 Technological Advantages and Ethical Risks

Translation technologies, such as Machine Translation (MT), Neural Machine Translation (NMT), and Computer-Aided Translation (CAT) tools, offer numerous advantages, including improved efficiency, speed, and cost-effectiveness. These technologies allow medical translators to handle large volumes of data in a fraction of the time it would take to translate manually. In situations such as a pandemic or during large-scale medical emergencies, where rapid translation of vital medical information is necessary, these tools become invaluable. They enable multilingual communication between healthcare providers and patients, disseminating essential public health information across language barriers quickly.

However, these advantages come with significant ethical risks. One of the primary concerns is the loss of human oversight. Machine-generated translations, while fast, often lack the contextual understanding and sensitivity that a human translator brings to medical texts. Machines are not adept at handling complex medical terminologies in nuanced or context-dependent ways. This is particularly concerning in the medical field, where a minor misinterpretation could lead to severe consequences, such as incorrect medication dosages, misdiagnoses, or treatment errors. For example, an incorrectly translated phrase in a medical prescription could result in a dangerous dosage being administered, putting patients at risk of harm.

Confidentiality is a critical concern when using translation technologies, especially cloud-based systems. Medical translators handle sensitive patient data, and uploading these documents to machine translation platforms could inadvertently expose confidential information to breaches or misuse. Healthcare information is governed by strict privacy regulations, such as HIPAA in the United States and GDPR in Europe. The ethical challenge lies in ensuring that translation technologies comply with these regulations, protecting patient confidentiality while still providing efficient translation services.

The tension between efficiency and ethical responsibility is a central challenge for medical translators. While technology increases productivity, it can undermine the ethical foundation of medical translation by prioritizing speed over accuracy and confidentiality. Thus, translators must navigate these risks, ensuring that technological tools do not compromise the ethical standards of their profession.

4.2 Impact on Accuracy, Humanitarian Considerations, and Medical Ethics

In the medical field, accuracy is no doubt the most important. A single mistranslation could have life-altering consequences. However, translation technologies, though useful, often compromise accuracy when used without human intervention. Machines struggle with context, particularly in complex medical terminologies that can have different meanings depending on the medical specialty, patient condition, or cultural background. For instance, medical terms like “jaundice” can have different treatment implications depending on the patient’s age or underlying conditions. A machine might mistranslate such terms, leading to potential harm if the human translator fails to catch the error. Beyond terminological accuracy, humanitarian considerations are integral to medical translation. Medical documents often communicate not only clinical information but also empathy and reassurance, particularly in sensitive areas like mental health or terminal illness care. Translation technologies are inherently impersonal and fail to convey the emotional undertones needed in these situations. The use of technology can dehumanize the

translation process, stripping the text of empathy and care. For example, a patient discharge summary, when translated without consideration of tone and emotional nuance, might appear cold or detached, eroding the trust between patient and healthcare provider.

Medical translation is about more than just conveying information—it's about maintaining the humanistic spirit of medical care, ensuring that patients feel understood and supported. Ethical norms in medical translation must emphasize the importance of maintaining compassion and empathy in communication. Medical ethics demands that translators not only ensure linguistic precision but also uphold the humanitarian values of healthcare, ensuring that translation supports the patient's well-being beyond clinical needs.

4.3 Translator Competence and Ethical Accountability

The increasing integration of technology into the translation process shifts the role of the translator from a hands-on task to a more supervisory one, where the translator's responsibility shifts towards evaluating, correcting, and refining machine-generated translations. This evolving role requires a new level of technical competence alongside linguistic expertise. Medical translators must be skilled not only in the languages they translate but also in understanding how translation technologies work, their limitations, and their risks. This shift raises the question of ethical accountability. When a machine translation error results in a harmful outcome, the ethical dilemma is: who should be held responsible—the translator who supervised the process or the technology provider who developed the tool? This blurred line of responsibility creates a complex ethical issue. Translators must recognize that, despite technological aids, they are ultimately accountable for the accuracy and integrity of the translation they deliver. They cannot relinquish their ethical obligations to technology.

The role of the translator now includes ensuring that technology does not lead to ethical compromises. Translators must act as guardians of quality, intervening where machine translation tools fail to deliver accurate, context-sensitive, or culturally appropriate results. They are responsible for ensuring that any errors introduced by technology are corrected before the final translation is delivered, particularly in high-stakes medical contexts where the consequences of mistakes are serious.

5. Defining Ethical Norms for Medical Translators in the Age of Technology

As technology continues to evolve, the role of medical translators has shifted, requiring them to integrate technological tools while upholding core ethical principles. Given the ethical dilemmas that have emerged, it is crucial to establish well-defined ethical norms to ensure that the use of technology complements, rather than compromises, the translator's ethical responsibilities. These norms must strike a balance between the efficiency offered by technology and the foundational ethics of accuracy, confidentiality, and compassion in medical translation.

5.1 The Ethical Foundations of Medical Translation

Medical translation is deeply rooted in both the ethics of professional translation and the broader principles of medical ethics. At its core, medical translation is guided by three key ethical principles: accuracy, confidentiality, and compassion. These pillars are essential in ensuring that translated medical content remains faithful to the original while also catering to the well-being of patients.

Accuracy is the cornerstone of medical translation. In the medical field, where lives often hang in the balance, even minor errors can have serious consequences. It is imperative that translations are precise, conveying not just the words but the context and nuances critical to patient care.

Confidentiality is another foundational ethical obligation. Medical translators handle highly sensitive patient information, and it is their duty to ensure that this information is safeguarded. The use of technology must not compromise patient privacy, and systems employed must adhere to strict data protection protocols.

Compassion reflects the humanitarian aspect of medical translation. Medical texts often go beyond clinical details, encompassing emotional and sensitive aspects of patient care. Translators must convey these human elements, ensuring that the tone and intent behind the communication are preserved. A medical translation that lacks empathy may erode the trust between patients and healthcare providers.

These ethical foundations should permeate all aspects of translation work, from patient consent forms to clinical trial results. When technology is incorporated, it should enhance the translator's ability to uphold these principles, never replacing their ethical obligations.

5.2 Principles Guiding the Construction of Ethical Norms

The construction of ethical norms for medical translators in the technological age requires the careful integration of several guiding principles that ensure the integrity of translations while leveraging the benefits of technological tools.

(1) Accuracy and Human Oversight: While machine translation tools such as Neural Machine Translation (NMT) can greatly improve efficiency, human oversight remains essential in ensuring that translations are accurate. Particularly in high-stakes medical contexts, such as patient treatment plans or pharmaceutical instructions, human translators must verify machine translations to prevent dangerous errors. Ethical norms should mandate this human oversight to ensure that no detail is overlooked.

(2) Confidentiality and Data Security: With the increasing use of cloud-based translation systems, the risk to

patient confidentiality rises. Ethical norms must require translators to use secure platforms that comply with privacy regulations like HIPAA or GDPR. The potential exposure of sensitive medical data to unauthorized parties can be catastrophic, so translators must ensure that their technological tools are equipped with robust data security measures.

(3) Empathy and Humanism: Medical translation is not merely a technical exercise; it is a human-centered task. Ethical norms should encourage translators to maintain the compassionate tone necessary in medical communication, especially in emotionally charged documents like mental health assessments or end-of-life care instructions. Even when using machine translations, translators must carefully review the text to ensure that the humanistic elements of the original message are preserved and conveyed with empathy.

(4) Accountability: Even with the aid of advanced technology, the human translator remains ultimately responsible for the final product. Ethical norms should enforce the understanding that translators bear full responsibility for the accuracy, confidentiality, and overall quality of their translations. They must own their work, ensuring that it meets the high standards required in the medical field, regardless of the tools used to achieve it.

5.3 Ethical Norms for Medical Translators: Humanism and Responsibility

In the age of technology, the ethical norms for medical translators must emphasize the delicate balance between humanism and responsibility. Technology has undoubtedly become an integral part of the translation process, but it should not overshadow the ethical imperatives that define the profession.

Humanism in medical translation goes beyond linguistic accuracy—it embodies the empathy and care essential to medical communication. Patients are not simply cases or data points; they are individuals with fears, hopes, and emotions. The translator's task is to ensure that these human elements are respected and communicated effectively, even when technology is involved. The challenge for medical translators is to preserve this compassionate approach while navigating the efficiency and precision of technological tools.

Responsibility requires translators to remain fully accountable for their work, regardless of the technological aids they use. The ethical norms should foster a culture of responsibility, where translators understand the profound impact their translations have on patient care. They must stay vigilant, ensuring that technological shortcuts do not lead to lapses in quality or confidentiality. Translators should be conscious of how their decisions—whether related to the tools they use or the final edits they make—affect the well-being of patients and the ethical integrity of the healthcare system.

6. Framework for Constructing Ethical Norms for Medical Translators

As translation technology becomes an essential tool for medical translators, the need for a structured and robust framework to guide ethical behavior is critical. Medical translators work in high-stakes environments where their translations directly affect patient care and health outcomes. The ethical norms must ensure that while leveraging technology, translators maintain their professional and ethical responsibilities. This framework will focus on constructing norms that balance the advantages of translation technologies with the ethical imperatives of medical translation.

6.1 Ideal Model for Ethical Norm Construction

The ideal model for constructing ethical norms for medical translators must be comprehensive, flexible, and context-sensitive, ensuring that the evolving nature of technology and medical communication is adequately addressed.

(1) ***Core Ethical Principles:*** The foundation of the ideal model lies in the core principles of medical ethics: accuracy, confidentiality, and compassion. Translators must ensure that their work accurately reflects the original text, maintains the privacy of patient information, and preserves the humanistic elements essential to medical communication. These principles should serve as a non-negotiable baseline in constructing norms for translators working with technology.

(2) Human-Technology Integration: The model must recognize the increasing reliance on machine translation and other tools, establishing norms that integrate technology responsibly. Translators should view technology as a supportive tool rather than a substitute for human insight. Ethical norms should require translators to exercise human oversight, especially in high-risk areas such as drug labeling, patient instructions, or surgical reports. Technology should enhance efficiency without compromising the translator's ethical accountability.

(3) Adaptability and Ongoing Education: Given the rapidly evolving nature of both the medical and technological fields, the ethical norms must be adaptable. An ideal model would involve ongoing professional development and education for translators, helping them stay informed about the latest technological advancements and their potential ethical implications. Translators must also be trained to identify and mitigate ethical risks, ensuring they can respond to new challenges as they arise.

(4) Collaborative Guidelines: Ethical norms should be developed collaboratively, involving not just medical translators but also medical professionals, ethicists, and technology developers. This collaborative approach will ensure that the norms are holistic and take into account the viewpoints of all stakeholders involved in medical communication and patient care.

6.2 Practical Challenges and Ethical Concerns

Despite the need for well-structured ethical norms, various practical challenges and ethical concerns make their implementation complex.

(1) Over-reliance on Technology: One of the primary challenges is the growing over-reliance on machine translation. As translation tools improve in speed and efficiency, there is a temptation to bypass human oversight, assuming that technology is accurate enough. This creates ethical concerns, especially when life-or-death situations are at stake. Translators may become overly confident in machine outputs, risking misinterpretation of critical medical terms or patient instructions.

(2) Confidentiality Breaches: With the rise of cloud-based translation platforms and machine learning tools, the risk of confidentiality breaches increases. Sensitive patient data could be exposed or stored improperly, violating privacy regulations like HIPAA or GDPR. The use of such platforms without adequate encryption or safeguards can lead to significant ethical dilemmas concerning data protection.

(3) Inadequate Translator Training: Not all medical translators have sufficient training in using advanced translation technologies. This lack of expertise can lead to poor-quality translations, and more significantly, translators may fail to understand the ethical risks posed by these technologies. Without adequate training, translators may unknowingly compromise accuracy or confidentiality.

(4) Blurring of Accountability: As machine translation becomes more prevalent, the division of accountability between the human translator and the technology provider becomes increasingly blurred. Who is responsible when a translation error, caused by a technological flaw, leads to patient harm? Defining clear lines of accountability is crucial, yet difficult to enforce in the current technological landscape.

6.3 Solutions and Strategies for Norm Implementation

To address the challenges and concerns highlighted above, several solutions and strategies can be employed to effectively implement ethical norms for medical translators in the age of technology.

(1) Mandatory Human Oversight: Ensuring that human translators review and correct all machine-generated translations is crucial. Final responsibility should always rest with the human translator, particularly in contexts where errors could significantly impact health outcomes.

(2) Robust Data Security Protocols: Strict data security measures must be established for translators using cloud-based or online platforms. Compliance with data protection laws is essential, and sensitive medical information should be securely encrypted, stored, and processed, with clear confidentiality agreements in place with technology providers.

(3) Continuous Training and Certification: Ongoing professional development should be integral to the ethical framework. Training programs must cover both the technical use of translation tools and their ethical implications. Standardized certification programs can help ensure that translators maintain competence in both areas.

(4) Clear Accountability Structures: Defining accountability roles among translation providers, technology developers, and translators is essential. Ethical norms should clarify liability in the event of errors, ensuring that all parties are held accountable based on the source of the mistake.

(5) Ethical Review Panels: Institutions employing medical translators should create ethical review panels to evaluate complex cases involving technology. These panels can provide guidance on ethically ambiguous situations, offering support to translators facing difficult decisions.

(6) Transparency with Patients: Greater transparency between translators, healthcare providers, and patients may be necessary. Informing patients when machine translation is used in their medical documents and outlining the oversight measures in place can help build trust and ensure they understand technology's role in their care.

Conclusion

The integration of translation technology into medical translation offers tremendous potential, but it also brings forth critical ethical concerns. While tools like Machine Translation (MT), Neural Machine Translation (NMT), and Computer-Assisted Translation (CAT) enhance the efficiency of handling vast amounts of medical information, they pose risks to core ethical values such as accuracy, confidentiality, and empathy. Medical translators are tasked with a delicate balancing act—harnessing the advantages of technology while ensuring that their translations meet the rigorous ethical standards essential in healthcare communication. This study emphasizes that ethical norms for medical translators must prioritize human oversight, safeguard sensitive patient information, and maintain the compassionate, human touch that medical translation demands.

Developing these ethical norms enables translators to proactively address the challenges posed by technological shortcuts, including potential inaccuracies and the risk of compromising confidential data.The framework proposed here aims to strike a balance between the increasing need for efficiency and the deep ethical responsibilities of medical translators. It equips them to navigate the rapidly changing landscape of translation technology while upholding the quality, accuracy, and empathy central to their work. Ultimately, these ethical norms will empower medical translators to continue performing their crucial role with professionalism and care, ensuring that they not only translate language but also preserve the integrity of patient care in an increasingly digital world.

Acknowledgement: This research was supported by the 2022 Guangxi Higher Education Young and Middle-Aged Teachers' Scientific Research Foundation Project in the Humanities and Social Sciences category (Project No. 2022KY0523). I would like to express my sincere gratitude to Guangxi Higher Education for providing the necessary aid and resources for this study.

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