Journal of Cancer Education
https://doi.org/10.1007/s13187-024-02401-4

EDITORIAL

When is good, good enough? On considerations of machine translation in patient education

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Accepted: 13 January 2024

The effect of migration on an increasingly integrated world has resulted in ever larger populations who lack proficiency in the dominant language in the place where they reside. This is especially true in large cities in wealthy nations, where hundreds of languages are spoken regularly [1]. In the field of healthcare, the problem of limited language proficiency can be particularly acute as the elderly who are less likely to demonstrate proficiency in the local language are more likely to require healthcare services [2]. Moreover, the difficulty of navigating complex healthcare systems places a premium on the ability of patients to demonstrate adequate health literacy (HL), a problem even more pervasive for conditions such as cancer, with its potential long-term outlook and multiple treatment pathways. In English-dominant health systems, having limited English proficiency (LEP) contributes to inadequate understanding of critical medical information such as dosages for medications, resulting in poor utilization of preventative healthcare services, delayed discharge from hospital, and errors in misdiagnoses [1, 3–6].

Patient education is particularly important with respect to cancer, with its complex treatment pathways, chronicity, and the premium it places on patient self-efficacy 7, 8. While the demand for translated cancer patient education materials to address these needs is enormous, conventional human translation is beyond the means of most healthcare institutions and in most instances, is prohibitive. To put the challenge of funding for the translation of patient education materials into perspective, the oncology patient education collection at a large, urban, academic cancer center located in downtown Toronto, includes approximately 1000 pamphlets. The average cost to translate one pamphlet is $960 CAD. If we were to translate these materials into the top 5 languages spoken in Toronto, it would cost approximately $4,800,000. Even with a five-million-dollar translation budget, that would only cover the cost of translation for 5 out of the approximately 160 languages spoken in the city of Toronto. With increasing migration contributing to the numbers of patients with limited language proficiency in the dominant local tongue as well the growing burden of the disease, the need for translated cancer patient materials is rising across the globe.

In response to the imperative need to provide equal access to patient education materials to all patients and the obvious financial constraints, some have raised the feasibility of utilizing machine translation software, where source-language text is used to automatically produce target-language text [9]. Up until very recently, the reliability of machine translation tools has not been strong enough to warrant use in patient education and indeed the debate over the ethics of machine translation rages on [10, 11]. Recent improvements, however, including the much-publicized advancements in artificial intelligence applications, have only heightened the possibility that machine translation could be leveraged in healthcare settings.

While studies have found wide variations in quality depending on the language, machine translation has demonstrated efficacy in producing accurate translations when the inputs are delivered in plain language, identified as a reading grade level below six [12, 13]. Using machine translation would then create an added benefit of encouraging the

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Published online: 23 January 2024

transformation of existing patient education materials into plain language, to the benefit of all patients. By simplifying complex terms during translation, machine translation may also help improve patient health literacy [14].

The use of machine translation we explore could consider both ease of machine translation with the importance of safeguarding patients. Materials must be assessed for their potential to adversely affect patient health, with those materials more likely to cause these outcomes to be reviewed and, if necessary, post-edited by human translators. This hybrid approach has scored better in comparison to machine-only translated materials in the past [15]. To generate support from translators, institutions must include them in the implementation process and highlight research that shows they are more productive when engaged in post-editing [16]. This latter fact can facilitate the greater use of their services so that machine translation is not perceived as a threat to their profession but a mechanism that facilitates greater use of their expertise.

Web-based plain language patient materials that are only available in English would be translated into the language of the user's choice and to ensure legal requirements are met users would be required to accept a disclaimer that acknowledges the lack of human oversight and its potential shortfalls. Analytical data could be kept concerning overall uptake, as well as resource and language metrics with regular audits conducted by human translators to ensure the quality of the most accessed materials. A feedback mechanism to elicit responses from users and input on further improvements could also be incorporated into the feature. Machine translation would need to, at least initially, be limited to materials with only minor clinical ramifications. Even with a restricted mandate, however, machine translation has the potential to vastly expand the access to relevant health information patients with LEP possess. The field of health communication sorely needs to deploy and evaluate machine translation technology in patient settings [10].

Too many cancer patients are excluded from meaningful involvement in their care and are heavily reliant on caregivers for translation, particularly with self-management increasingly a part of the care framework [17]. English-proficient patients on the other hand are able to access a host of hospital resources and literature (to say nothing of informal sources) that help them both better understand their treatment and advocate for themselves. While some may argue that universally available human translation must fill this gap, this is an unreasonably high barrier that will only forestall meaningful efforts to bridge language barriers. There are certainly possible pitfalls with adopting machine translation at this stage [10]; combined, however, with reasonable precautions, it can alleviate the existing burdens on informal patient support networks while demonstrating to LEP patients that healthcare systems recognize and are working to address their translation needs.

Conclusion

Although it would be ideal to have dedicated translation budgets that would allow equal access to patient education materials, regardless of English language proficiency, the reality is that this is unlikely to happen in the context of resource constrained health systems. We suggest that perfection must not be allowed to be the enemy of the good, and patient education programs can leverage machine translation, possibly in conjunction with human post-editing, to enable more efficient use of limited funds. With the increasing availability of artificial intelligence tools, patients are likely to avail themselves of the services of translation software when receiving care. The limited adoption of machine translation by healthcare centers helps provide some oversight over quality while alerting users to the ongoing limitations that come with these emerging technologies. However, the pace of quality advances in machine translation suggests that in future, the debate over its use may become moot and machine translation could become a staple tool in patient education.

Declarations

Conflict of interest The authors declare no competing interests.

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