## Original Article:

# Quality assessment of medical translations performed by the two groups of medical translators and physicians

**Elahe Abootorabi[1,*], Seyed Nezamaddin Moeinzadeh[2]**

[1]English Department, Kerman Institute of Higher Education, Kerman, Iran
[2]English Department, Kerman Institute of Higher Education, Kerman, Iran

*Corresponding Author: email Address: e.abootorabi@yahoo.com (E. Abootorabi)

## ABSTRACT

Translating medical texts is a very risky and important task because these texts deal with human life and any mistake in their translation can be life threatening. However, physicians, as well as medical translators, do this task and believe that the quality of their translation is more better than one performed by the medical translators but due to lack of time, they have to employ medical translators for doing this task. The aim of this study was to assess the quality of medical translations performed by the two groups of medical translators and physicians using House's model. For this purpose, the book "Bate's Guide to Physical Examination and History Taking" written by Fiona R. Prabhu and Lynn S. Bickley published in 2003 (ST) and its two versions of Persian translation performed by two groups of medical translators (TT1) and physicians (TT2) were analyzed according to the steps described in the House's model and the mismatches (overt and covert errors) were determined. Then the translations were classified as over or covert translations and the reasons were described. The results show that neither medical translators (with English knowledge and translating skills) nor physicians (with Medical knowledge) can perform a high quality translation of medical texts alone and without cooperation with the other group. It was concluded that for presenting a high quality translation, medical translators and physicians should have cooperation with each other and a team of medical translators and physicians is required.

**Keywords:** Medical translators, Physicians, House's model, Translation

## INTRODUCTION

In the medical sector, translation is a small, yet simultaneously big issue. It is a small issue– and almost a non-issue– because compared with the total effort of the medical professionals for developing a medicine or medical device, doing research and examination on patients, and writing and representing the results of their research, producing patient or user information by translating the results of their research is an activity that does not cost a lot and often does not get much attention [1]. It is a big issue when something goes wrong and the reality hits that this type of information should be produced professionally [1]. As medical texts are scientific and informative texts, based on the suggestion of Katherina Reiss [2], the TT of an informative text should transmit the full referential or conceptual content of the ST.

The translation should be 'plain prose', without redundancy and with the use of explicitation when required [3]. So, the translation of informative text should focus on the factual content and terminology rather than stylistic niceties. Translation of medical and pharmaceutical documentation is a complex and demanding challenge for a language service provider. On the one side, there's an unavoidable requirement to involve only experts, such as doctors, biologists, or pharmacists, in the translation process of medical or pharmaceutical documents. On the other side, you're facing a big responsibility, because the results of your work can significantly influence someone's health and medical condition [4]. In other words, by misinterpretation of the facts discovered by physicians, and therefore, by misleading the people especially other physicians around the

world through producing a bad translation of the medical texts, the translation become a life threatening piece of paper that not only does not give the correct information to the society and medicine community, but also is dangerous and life threatening for the society. So, the translation of medical texts is a risky task that should be done by professional translators who are familiar with medical sciences as well as translating skills. Day Translation Team announced that the technical translator must have knowledge of the subject matter. There is no going around it. The translator must understand a term's deeper meaning so that appropriate research could be made, even if it does not have a semblance to the original language [5]. As Newmark notes "the medical translator has much more freedom with grammar than with lexis" [6]. Kim also believed that extralinguistic knowledge plays a key role in presenting a good medical translation. Apart from the mastery of translation methodology, extralinguistic knowledge has to be accompanied by linguistic competence, which in the case of the translation of specialized texts might seemingly play a minor role, which means that a professional in the field of medicine might perform a better translation than a translator who lacks scientific knowledge in the field. Thus, the quality of the translation product is highly influenced by extralinguistic knowledge [7]. Henry Fischbakh (1962) also believed that a technical translator must combine three faculties: He must have a fairly extensive knowledge of, and be able to reason in, the subject matter of the translation, he must be able to read the language he is translating well enough so that he can grasp the author's intended meaning, and he must himself be able to embody that meaning in lucid and straightforward English, French, Spanish, etc [8]. However, many physicians in addition to many medical translators do this critical task. They claim that knowing medical terminology facilitate the translation of medical texts and English knowledge and translating skills cannot handle this job as the former. In contrast, medical translators believe that just knowing the terminology of medical texts is not enough for providing a good translation and the text should be structurally and semantically correct. However, there are many essays and books that are translated or written by the physicians but they are not written or translated in accordance with English rules and they are full of mismatches and errors; therefore, they are required to be edited by English translators who have English knowledge and translating skills. In addition, there are many essays that are not accepted to be published in medical journals due to their English grammatical and semantic problems. Accordingly, medical translation is costly and time consuming because lacking English knowledge and translating skills make physicians to pay the cost of English editing to English translators or editors in addition to spending time and cost to translate the texts. Furthermore, the reliability of the authors will be reduced by the rejection of their essay in medical journals due to grammatical and semantic errors. The purpose of this study was to assess the quality of medical translations performed by the medical translators (with English knowledge and translating skills) and physician (with medical knowledge) who translate the medical texts, using a model presented by Juliane House (1977) [9] to find out whether Medical knowledge is enough for representing a high quality translation of medical texts or English knowledge and translating skills are also required. In other words, the aim of this study was to find out whether medical translators (with English knowledge) and physicians (with medical knowledge) alone can perform a high quality medical translation or a group of medical translators and physicians is required for the translation of medical texts. The results of this study are useful for both translators and physicians because if it is proved that for translating medical text, English knowledge and translating skills are also required in addition to medical knowledge, so the physicians can trust translators and employ them for translating and editing medical texts, and some English training courses in the medical sciences universities will help physicians to learn English grammar and rules for providing a good translation; subsequently, in terms of time and cost, it would be commodious for physicians. In addition, by trusting the translators, the reliability rate of authors would not be reduced due to the rejection of their essay in medical journals. In contrast, if it is proved that physicians can

translate medical texts without help of medical translators who have English knowledge, again, in terms of time and cost, it would be commodious for physicians.

## REVIEW OF LITERATURE

Translation of medical and pharmaceutical documentation is a complex and demanding challenge for a language service provider. On the other side, there is an unavoidable requirement to involve only experts, such as doctors, biologists, or pharmacists. In the translation process of medical or pharmaceutical documents. On the other side, you are facing a big responsibility, because the results of your work can significantly influence someone's health and medical condition. Therefore, each translator should carry out some stages in order to present a high quality translation [4]. As Clio Schils (2015) announced, medical translation is legally required for [10]:
Medical devices
- Instructions for use (IFS)
- Packaging
- Labeling
- Software

Medicines
- Summary of product characteristics (SmPC)
- Labeling, inner and outer packaging
- Patient information leaflet (PIL) medicines summary

Clinical trials
- Informed consent forms (for patient subjects)
- Study protocols
- PROs, such as questionnaires and scales
- Instructions for nurses

Day Translation Team (2015) announced that the technical translator must have knowledge of the subject matter. There is no going around it. The translator must understand a term's deeper meaning so that appropriate research could be made, even if it does not have a semblance to the original language [5]. Kim (2006) also believed that extralinguistic knowledge plays a key role in representing a good medical translation. Apart from the mastery of translation methodology, extralinguistic knowledge has to be accompanied by linguistic competence, which

in the case of the translation of specialized texts might seemingly play a minor role, which means a professional in the field of medicines might perform a better translation than a translator who lacks scientific knowledge in the field. Thus the quality of the translation product is highly influenced by extralinguistic knowledge [7]. As Newmark (1979) notes "the medical translator has much more freedom from grammar than with lexis". In order for a translated biomedical article to be accurate and to rise to the standards of the target language, the translator has to match the frequency of the features of the source language text (terminology, compounds, syntax, and word order) to equal frequency of the corresponding feature in the target language text [6]. Henry Fischbakh (1962) also believed that a technical translator must combine three faculties [8]:

1. He must have a fairly extensive knowledge of, and be able to reason in, the subject matter of the translation.
2. He must be able to read the language he is translating well enough so that he can grasp the author's intended meaning.
3. He must himself be able to embody that meaning to lucid and straightforward English, French, Spanish, etc.

Considering the significance of medical translation, special attention should be paid to the quality of the translations of these texts. There are many studies have been performed on the medical translation and evaluation of the quality of the medical translations but in this study, three groups of the studies have been interviewed; studies on translation quality assessment (TQA), studies on medical translation, and studies on medical translation quality assessment (MTQA).

## STUDIES ON TRANSLATION QUALITY ASSESSMENT

Hossein Heydari Tabrizi et al (2012) in their study assessed the quality of Persian translation of Orwell's (1949) *Nineteen Eighty-Four* by Balooch (2004) based on House's (1997) model. To do so, 23 pages (about 10 percent) of the source text were randomly selected. The profile of the source text register and the genre was realized. The source text profile was compared to the translation text profile. The results of the comparison were dimensional mismatches and overt errors. The

dimensional mismatches were categorized based on different dimensions of the register including field, tenor, and mode. The overt errors which were based on denotative mismatches and target system errors categorized into omissions, additions, substitutions, and breaches of the target language system. Then the frequencies of occurrences of subcategories of overt errors along with their percentages were calculated. The overt errors and dimensional errors were analyzed errors. The dimensional mismatches as well as a large number of major overt errors such as omission and substitutions indicated that the translation was not in accordance with the House's view stating that literary works needed to be translated overtly. In other words, mismatches on different levels of register showed that the cultural filter was applied in translation and the second-level functional equivalence required for overt translation was not reached. As a result, the Persian translation of *Nineteen Ninety-Four* did not fulfill the criteria to be an overt translation. Instead, this translation tended to be a covert one [11]. Yamini and Abdi (2010) assessed the quality of Ala'uddin's Pasargadi's Persian Translation of William Shakespeare's *Macbeth* on the basis of House's Translation Quality Assessment Model to investigate the potential power of this model to predict the errors in Persian translations of literary works. The researcher randomly selected some samples of source text and target text and analyzed them using House's model. Chi-Square statistical procedure was employed to compute differences between observed and expected frequencies of the errors which were categorized into "covertly erroneous errors" and "overtly erroneous errors". Overtly erroneous errors were further categorized into five categories: *1) Not translated; 2) Slight change in meaning; 3) Significance change in meaning; 4) Distortion of meaning; 5) Breach of the target language system.* The results indicated a statistically significant difference between the two kinds of errors and among the five types of overtly erroneous errors. They conclude that this piece of translation did not comply with the hypothesis "a literary work, according to House's model, has to be translated overtly and any deviation of it will be considered as an error". The translation was considered as a covert kind of translation rather than an overt one [12].

## STUDIES ON MEDICAL TRANSLATION

Nina Rask (2008) in her study investigated the difficulties in translating a medical text from English into Swedish. She used a British textbook about geriatrics called "Nursing Older People". She found that the translation difficulties have involved terminology and cultural aspects. This analysis showed how these problems were tackled by studying different translation theories, such as Munday (2001) who refers to Koller's theory about equivalence and Vinay and Darbelnet's model of direct translation and oblique translation as well as Ingo (2007) who accounts for text sort conventions. The terminological problems involved choosing the most appropriate term for describing diagnosis, diseases, body organs, and symptoms. There was a wide variety of terms from old Graeco-Latin terms to English terms coined in the 1990s. Other terms were related to the international field of epidemiology as well as the organization of care for the elderly, based on the Swedish Social Services Act. A suitable choice is possible by considering aspects frequent usage of field specific words and collocations in parallel texts. In cultural aspects involved cultural references such as differences between Sweden and the UK as for national institutions and organizations. The solution is to find a cultural equivalent or, when this is not possible, explain the term in a footnote [13]. Sue Ellen (2012) focused on Sci-Tech texts, along with their categorization and translation, and viewed them in the context of spoken discourse. She believes that identification of the source language is usually unproblematic, and specification of the target language depends on the potentially complex needs and intention of the requester. The subject field of the text is coordinate with its special language. The vocabulary of special languages is documented in specialized lexicography and terminological dictionaries. Even if scientists use English, mother-tongue terminology is critical for the dissemination of scientific information and for stimulating interaction between science and technology; thus, rendering technical expertise accessible

to all sectors of the population. She concluded that in order to translate effectively, either at the science-to-science level or across any of the technology levels, mediating between a language with rich special languages and those that are inadequately developed requires the consistent creation of new terminology [14]. Hajar Khanmohammad et al (2014) performed a Linguistic-based investigation into the frequency of translation shifts in the process of translating medical texts from English into Farsi in Iran. Five books were selected from five branches or sub-branches of medicine in which a large number of English-into-Farsi translations have been done in Iran. Then, two chapters from each book were selected. Afterwards, 10% of the sentences of each chapter were sampled and analyzed. On the whole, from among 320 sampled sentences, all the sentences had undergone structural shift, 4.06% had undergone class shift, 5.31% had undergone unit shift, and 7.81% had undergone Intra-system shift. In conclusion of this study, considering the features of English and Farsi, the low number of shifts in medical texts suggest that in many cases no translation actually has been taken place and transliteration was the preferred approach for the erudite terms [15]. Wioleta Karwacka (2014) discussed medical translation policy, translation quality management procedures, with particular focus on back-translation and parallel translation in the light of improving the quality of translation and interpreting for the medical sector. It was concluded that in order to facilitate communication with foreign or immigrant patients with limited language proficiency, and provide translated versions of medical documents (regulatory documents, scientific papers, patients forms), professional medical translators need to be employed. A model was also provided in this study to promote better standards of quality in medical translation [16]. In another study, Ali Akbar Zeinali (2015) provided a brief terminological description of the selected English medical terms and their equivalents in the Persian language. The data consisting of 339 medical terms chosen under the "Connective Tissue and Musculoskeletal System" of the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) and their equivalents in the Persian language were selected for this study. The target terms

were compared and analyzed based on the secondary term formation processes, with regard to morphosemantic factors. The quantitative and qualitative analysis of the data indicated that various mophosemantic factors were involved in the secondary term formation processes of the Persian medical terms. The findings demonstrated that most of the incompatible equivalents were found in lexicology area; while semantic problems in them covered smaller proportion. Derivational capability and compliance with the language rules are two morphosemantic factors which need further attention in Persian language [17]. Abrosimova, A et al (2015) in their study investigated the general and nationally specific features of the English medical abbreviations, surveyed extra- and intralinguistic requisites of their formation, determined regularities of medical abbreviations usage in modern English, and analyzed the peculiarity of classification of abbreviations. Special attention was also given to investigating some basic procedures applicable in translating them. They used such research methods as the method of component analysis of meaning based on dictionary definitions, the method of contextual analysis of the abbreviations, identifying their situational relevance. They also collected and processed nonregistered English medical abbreviations. Continuous sampling of the studied units of scientific and medical texts identified corpus examples. Materials used for their study was selected from articles, periodical literature on medicine and its related branches of science, from encyclopedic dictionaries. They concluded that ordering of abbreviation in medicine can be achieved through a more thorough study of medical abbreviations, their proper use in medical professional training by means of modelling, which fixes the most convenient, concise and succinct clichés in medical discourse [18]. However, there are limited studies on the Medical Translation Quality Assessment (TQA). In the study of Zekavati and Azimi Amoli (2013), the effect of medical background knowledge on enhancing the translation quality among medical and translation students were systematically and dynamically investigated. Participants in this study included 100 medical students and translation students in Islamic Azad University in Tehran, Iran. They had the mean age of 22

and there were 45 males and 55 females in the sample. In order to determine the level of proficiency of the participants in both groups, the same Nelson proficiency test was first administered to all of them. Students in both groups were asked to translate some medical texts from English into Persian. Outputs of the two groups were compared to assess the impact of medical background information. The quantity and quality of background information were also analyzed to examine their influence on the quality of translation. Results showed that those students having medical knowledge performed better in translating English texts related to medical science, in comparison to those learners who were not familiar well with medical knowledge. In other words, technical knowledge could play a significant role in enhancing the quality of medical translation from English into Persian [19].

## MATERIALS AND METHODS

In this study, the eighth edition of the book "Bate's Guide to Physical Examination and History Taking" (2003) written by Fiona R. Prabhu and Lynn S. Bickley that was designed for the students of health care who are learning to talk with patients, to perform their physical examinations, and to apply clinical reasoning to understand and assess their problems was chosen as the source text (ST) [20]. And two versions of its Persian translation performed by the two groups of medical translators and physicians were chosen as the target texts (TTs). One book (written in Persian language) titled as "Bate's Guide to Physical Examination and History Taking" was translated by a group of medical translators in 2003 [21]. The other one (written in Persian language) tilted as "Bate's Guide to Physical Examination and History Taking" was translated by a group of physicians in 2003 [22]. In this analytical descriptive study, to assess the quality of translations performed by medical translators and physicians, the Julian House's model (1997) was applied to the translations [9]. For this purpose, a register profile (field, tenor, and mode) was provided for the three texts (ST and TTs), the genre of the texts (ST and TTs) was studied, and a statement of function was provided for the texts (ST and TTs) based on the steps described in the House's model (1997) for

translation quality assessment in order to reveal a number of errors and mismatches in the translations by the researcher. Data obtained from the texts analysis were confirmed by a researcher in medical fields.

## RESULTS

The results obtained from analysis of the ST and TTs showed that since the ST was an instructive medical book in English that was written for medical students in order to teach them how they should examine patients;therefore, simple, clear, and imperative structures were used in this book. As it was reveled in comparison of ST and TTs, the simple, clear, and imperative structures were also used in these versions of translation performed by the medical translators and physicians. Therefore, there was no mismatches between the ST and TTs' Field. On tenor, it was also revealed that the *social role relationship* and *the social attitude* between the medical translators and physicians as instructors and medical students as practitioners in the TTs was the same as ST. In other words, the medical translators and physicians gave some practical instructions to medical students for examining the patients. In addition, there was no mismatches between the ST and TTs' mode. On mode, *the medium* of ST and TTs was "written to be read and performed because besides using written form for giving instructions, many real pictures, tables, and figures were also used for better understanding of the medical students in TTs as ST. The *participation* was kept by the medical translators and physicians, and all texts got monologue participation. The ST ideational function was kept up to a large extent in TTs. The *Genre* of all texts was the same and all three books were scientific books in medicine. Therefore, there was no covertly erroneous error between the ST and TT1. The main mismatches between ST and TTs were overtly erroneous errors that were categorized in five categories: wrong translation, grammatical errors, mistransference, untranslated and transferred in SL, and deletion. It was revealed that among 48 mismatches reported in the TT1, wrong translation (n=26) was the most common mismatch. The next more frequent mismatches were untranslated and transferred in SL (n=9), deletion (n=8), and mistransference (n=5),

respectively. There was no grammatical errors in TT1. It shows that English knowledge could help the translators to deal with grammar without any errors and problems. Analysis of TT2 also showed that similar to TT1, among 48 mismatches reported in the TT2, wrong translation (n=22) was the most common mismatch. The next more frequent mismatches were deletion (n=9), untranslated and transferred in SL (n=8), mistransference (n=5), and grammatical errors (n=4), respectively. The frequency of mismatches related to the mistransference was the same (n=5). The frequency and percentage of overt errors in TTs were shown in Table 1.

**Table 1.** Frequency and percentage of overt errors in TTs

| Mismatches | Frequency | | Percentage (%) | |
|---|---|---|---|---|
| | TT1 | TT2 | TT1 | TT2 |
| Wrong translation | 26 | 22 | 27.08 | 22.91 |
| Grammatical errors | 0 | 4 | 0 | 4.16 |
| Untranslated and transferred in ST | 9 | 8 | 9.37 | 8.33 |
| Mistransference | 5 | 5 | 5.20 | 5.20 |
| Deletion | 8 | 9 | 8.33 | 9.37 |
| Total | 48 | 48 | 50 | 50 |

As shown in Table 1, the frequent errors in TT1 was wrong translation (27.08%) indicating that the main problem of medical translators in translating the medical texts was lack of medical knowledge. In TT2 also, the most frequent error was wrong translation. It is interesting that physicians with medical knowledge had such errors in translating medical text. Before, it was supposed that physicians with medical knowledge could perform a high quality translation of medical texts but here, it was proved that there was no significant relationship between medical knowledge and medical translation quality. However, the difference in wrong translations between TT1 and TT2 was significant (4.17%). The second frequent overt error in TT1 was related to the untranslated and transferred in SL (9.37%) while its frequency in TT2 (8.33) was lower than those in TT1. It shows that medical translators compared to the physician had less medical knowledge; therefore, they preferred to put it untranslated rather than translating it incorrectly. However, there were some cases in TT2 (8%) that were kept untranslated and transferred in SL indicating that physicians with medical knowledge may also have some problems in translating medical terms and texts. The difference between the frequency of untranslated and transferred in SL in TT1 and those in TT2 was not significant (1%). The

third frequent errors in TT1 was deletion (8.33) that its frequency was less than that in TT2. Two errors had the same function (untranslated and transferred in SL and deletion), ST was not translated at all through these two errors. In other words, through the first error, the terms were transferred and could be read by the readers just in SL but through another error, the terms were deleted completely and readers cannot even be aware of those terms and the meaning may be changed through this deletion. Therefore, since the frequency of untranslated and transferred in SL was less than deletion in TT2, it is concluded that physicians had more fidelity to ST compared to the medical translators whose errors related to untranslated and transferred in SL was higher than deletion. It is also interesting that the frequency of mistransference in TTs was the same (5.20%) indicating that there was no relationship between medical or English knowledge and mistransference. The last error was related to the grammatical errors that as it was expected, its frequency in TT2 (4.16%) was higher than those in TT1 (0%). In fact, there was no grammatical errors in TT1 that was performed by medical translators. Therefore, there was significant relationship between English knowledge and grammatical errors in medical translation. The percentage of overt errors in TT1 and TT2 were compared in Figure 1.
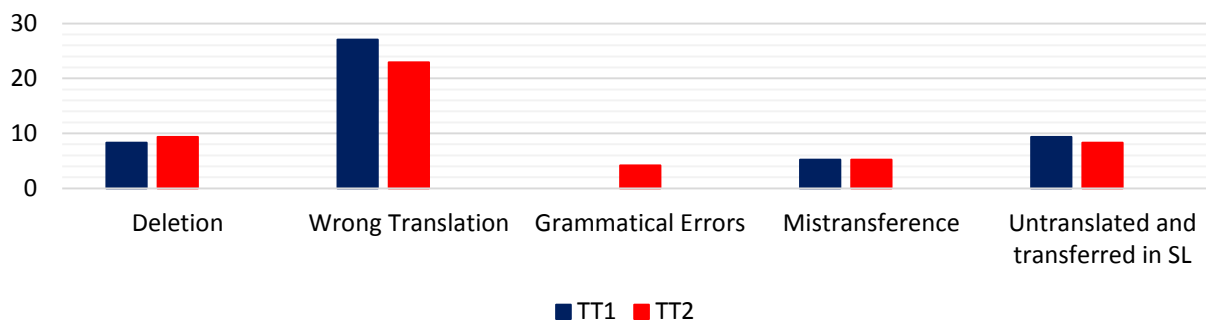
**Figure 1.** Comparison of the percentage of overt errors in TT1 and TT2

As shown in Figure 1, mistranslation was the main mismatches in TT1 and TT2 indicating that neither English knowledge nor medical knowledge alone can help the translators to perform a high quality translation of medical texts and mistranslations can be seen even in the translation performed by the physicians who had medical knowledge. In addition, the frequency of grammatical errors and mistransference was the same in both

translations indicating that these errors relating to the English structures can be seen even in the translation performed by the medical translators who have English knowledge. Therefore, since there was no mismatches between the Register (field, tenor, and mode) and Genre of ST and TTs, these translations were considered as covert translations which enjoy the status of the original source text in the target culture.

## DISCUSSION

Comparison of the ST and TTs profile showed that the register and genre of all texts were the same. In other words, ST and TTs were instructive scientific books in medicine which aimed to give some practical instructions to medical students for examining different parts of the patient's body. These books also can be read by others who are interested in medicine and examining patients but the main addresses of these books are medical students. Therefore, there was no mismatches in Register and Genre as dimensional errors. In both TTs, the translators tried to transfer the meaning correctly but there were also some denotative errors as overtly erroneous errors. As before were categorized, the overt errors considered in both TTs were: wrong translation, mistransference, grammatical errors, untranslated and transferred in SL, and deletion. Based on this categorization, the TTs were analyzed and overt errors were classified in each group. As shown in Table1, the most frequent error in TT1 was wrong translation (27.08%) indicating that the main problem of medical translators in translating medical texts was

lack of medical knowledge. In TT2 also, the most frequent error was wrong translation. It was interesting that physicians with medical knowledge had such errors in translating medical text. Before, it was supposed that physicians with medical knowledge could perform a high quality translation of medical texts but it was proved that there was no significant relationship between medical knowledge and quality of medical translation. However, the difference in wrong translation between TT1 and TT2 was significant (4.17%). The second frequent overt error in TT1 was related to the untranslated and transferred in SL (9.37%) while its frequency in TT2 (8.33) was less than that in TT1. It showed that medical translators compared to the physician had limited medical knowledge, therefore, they preferred to put it untranslated rather than translating it incorrectly. However, there were some cases in TT2 (8%) that were kept untranslated and transferred in SL indicating that physicians with medical knowledge may also have some problems in translating medical terms and texts. The difference in the frequency of untranslated and transferred in SL between TT1 and TT2 was

not significant (1%). The third frequent error in TT1 was deletion (8.33) that its frequency was less than that in TT2. Two errors had the same function (untranslated and transferred in SL and deletion), ST was not translated at all through these two errors. In other words, through the first error, the terms were transferred and could be read by the readers just in SL but through another error, the terms were deleted completely and readers cannot be aware of those terms and the meaning may be changed through this deletion. Therefore, since the frequency of untranslated and transferred in SL was less than deletion in TT2, it was concluded that physicians had more fidelity to ST compared to the medical translators whose errors related to untranslated and transferred in SL was higher than deletion. It was also interesting that the frequency of mistransference in both TTs was the same (5.20%) indicating that there was no relationship between Medical or English knowledge and mistransference. The last error was related to the grammatical errors that as it was expected, its frequency in TT2 (4.16%) was higher than that in TT1 (0%). In fact, there is no grammatical errors in TT1 that was performed by medical translators. Therefore, there is significant relationship between English knowledge and grammatical errors in medical translation.

## CONCLUSION

According to the results, since the frequency of overt errors in TT1 and TT2 is the same (50%) and subsequently, the quality of both TTs is the same; therefore, it is concluded that and neither medical translators (with English knowledge) nor physicians (with Medical knowledge) can perform a high quality translation of medical texts alone and without cooperation with the other group and for presenting a high quality translation, medical translators and physicians should have cooperation with each other and a team of medical translators and physicians is required.

## ACKNOWLEDGEMENTS

## REFERENCES

1.Andriesen S. Quality Control in Medical Translations. Innovations in Pharmaceutical Technology. 2006.

2.Reiss K. Text types, translation types and translation assessment. Readings in translation theory. 1989:105-15.

3.Munday J. Introducing translation studies: Theories and applications: Routledge; 2016.

4.Reflex Medical & Pharmaceutical Translation [Web Site]. 2017. Available from: http://www.reflex.hu/en/medical-translation/.

5.Challenges in medical translations [Web site]. https://www.daytranslations.com2017. Available from: https://www.daytranslations.com/blog/2015/06/challenges-in-technical-translation-6354.

6.Newmark P. A layman's view of medical translation. British medical journal. 1979;2(6202):1405.

7.Kim R. Use of extralinguistic knowledge in translation. Meta: Journal des traducteursMeta:/Translators' Journal. 2006;51(2):284-303.

8.Fischbach H. Problems of medical translation. Bulletin of the Medical Library Association. 1962;50(3):462.

9.House J. Translation quality assessment: A model revisited: Gunter Narr Verlag; 1997.

10. Schils C. (2015). 3 Big Challenges for Life Sciences Translation on September 20, 2016 from: https://www.sajan.com/3-big-challenges-for-life-sciences-translation

11.Tabrizi HH, Chalak A, Taherioun AH. Assessing the Quality of Persian Translation of Orwell's Nineteen Eighty-four Based on House's Model: Overt-covert Translation Distinction. Acta Linguistica Asiatica. 2015 Feb 17;4(3):29-42.

12.Yamini H, Abdi F. The Application of House's Model on William Shakespeare's "Macbeth" and its Persian Translation by Ala'uddin Pasargadi. 2010.

13.Rask N. Analysis of a Medical Translation: Terminology and cultural aspects. 2008.

14.Wright SE. Scientific, technical, and medical translation. 2011.

15.Mousavinasab SMH. TRANSLATION SHIFTS IN MEDICAL TRANSLATION FROM ENGLISH INTO FARSI.

16.Karwacka W. Quality assurance in medical translation. JosTrans. 2014;21.

17.Zeinali AA, Solati A, Omar HC, Awang R. Persian Medical Terms, Naming and Morphosemantic Factors: A Discussion in Medical Translation. International Journal. 2015;3(1):82-7.

18.Kuzmina OD, Fominykh AD, Abrosimova NA. Problems of the English Abbreviations in Medical Translation. Procedia-Social and Behavioral Sciences. 2015;199:548-54.

19.Zekavati F, Amoli FA. The role of medical background knowledge on improving the translation quality among medical and translation students. European Online Journal of Natural and Social Sciences. 2013;2(2):240.

20.Bickley L, Szilagyi PG. Bates' guide to physical examination and history-taking: Lippincott Williams & Wilkins; 2012.

21.M K, M J, A S, E G, A AA. Bates' guide to physical examination and history-taking: Noor E Danesh; 2003. (It is a book written in Persian language)

22.A TM, I S, R M, M N, F AA. Bates' guide to physical examination and history-taking: Noor E Danesh; 2003. (It is a book written in Persian                                language