JOURNAL OF MODERN SCIENCE

4/64/2025

www.jomswsge.com

DOI: 10.13166/jms/214312

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THE INFLUENCE OF LANGUAGE BARRIER ON RISK PERCEPTION AND BEHAVIORAL INTENTIONS IN MEDICAL TOURISM. APPLICATION OF THE THEORY OF PLANNED BEHAVIOR

Abstract

Objectives: *The goal of research was to analyze the potential impact of the language barrier and the information obtained about the barrier on medical patients' perceptions of risk, as well as the impact of perceived risk on their attitudes and intentions to use medical tourism services.*
Material and methods: Based on the results of existing research and current theory, a research model was developed, in which six research hypotheses were formulated. Then, through random-quota sampling, 1146 Poles aged 18 and over were surveyed using a fully structured survey questionnaire.
Results: *The perceived risk of medical tourism services by survey participants significantly influenced both attitudes toward such services and the willingness to travel in question itself. The factor significantly moderating the relationship between perceived risk and attitudes toward medical tourism services was the age of the respondents. Moreover with the simultaneous increase in the importance of the language barrier and the increase in the importance of acquired information on communicating with medical personnel, the perceived risk of medical tourism services decreased in the respondents. This indicates that the importance of the information about a language barrier in communication with medical personnel may influence a reduction in the level of perceived risk accompanying the services in question.*
Conclusions: *The conclusions of the study showed the vital importance of patients obtaining information about a possible communication barrier in a foreign medical facility. This findings can be useful to medical tourism players in the context of creating effective marketing communication in this regard, as well as developing tools to break down such barriers.*

Keywords: *medical tourism, behavioral intention, perceived risk, communication barrier, Theory of Planned Behavior*

Introduction

The past two decades or more have seen a significant growth in medical tourism research, reflecting the complex nature of medical care services and the ever-increasing importance of this sector in the global healthcare industry. In the context of studying the decision-making processes of medical tourism customers, The Theory of Planned Behavior is applicable, providing interesting insights into the factors that influence the intentions of people seeking medical services outside their home country. Previous studies in this field have examined behavioral intentions (Seow *et al.*, 2016; Park *et al.*,

2017; Suki *et al.*, 2015; Ramamonjiarivelo *et al.*, 2015), including studies of young consumers' intentions (Boguszewicz-Kreft *et al.*, 2019; Martin *et al.*, 2011); satisfaction with medical services (Park *et al.*, 2017); motivation and factors influencing decision-making processes (Boguszewicz-Kreft *et al.*, 2020; Crooks *et al.*, 2010; Johnston *et al.*, 2012); the role of patients' perceived risk (Boguszewicz-Kreft *et al.*, 2022); the impact of COV-19 on medical tourists' intentions (Pahrudin *et al.*, 2021); the impact of digital platform integration on medical tourist behavior (Arrioja-Castrejón *et al.*, 2023) or, finally, the impact of medical tourism on healthcare systems (Snyder and Crooks, 2016).

The importance of perceived risk in the decision-making process has been one of the key areas of scholarly discourse in medical tourism topics in recent years, with researchers emphasizing the need for a deeper understanding and comprehension of the various dimensions of this risk (Snyder *et al.*, 2013; Khan *et al.*, 2017; Matiza, 2020; Seow *et al.*, 2017; Oh *et al.*, 2014; Wang, 2012), if only in the context of preparing more effective marketing communication strategies aimed at the consumer of MT services (Menvielle *et al.*, 2014, Boguszewicz-Kreft *et al.*, 2022).

In the multi-threaded stream of research on the perception of risk in medical tourism and the nature of its impact on the consumer's decision-making process, researchers analyze, among other things, the operational dimension of this risk, including the risk of a barrier to communication with medical personnel abroad (Zakaria et al., 2021; Nowina-Konopka, 2016). The aforementioned conducted studies concerned various regions of the world, reflecting the global nature of medical tourism, but the geographical distribution of the studies is asymmetrical.

In fact, it can be observed that the vast majority of analyses of perceived risk in medical tourism focus on Asian respondents and markets, for example, studies: (James, 2012; Xu *et al.*, 2021; Omar *et al.*, 2023; Ghasemi *et al.*, 2021; Dash, 2021), (Li and Huang, 2023; Wang, 2012; Mosazadeh *et al.*, 2022; Kim *et al.*, 2019). Far less recognized are other markets, for example North America (Snyder *et al*, 2013; Snyder *et al.*, 2016; Snyder *et al.*, 2014) or the European market (Androutsou and Metaxas, 2019; Biernacka, 2015; Dryglas and Lubowiecki-Vikuk, 2019; Białk-Wolf *et al.*, 2016).The present study thus deals with this less researched region of Europe, which, from a research

perspective, may be an important element of this paper's originality and an attempt to fill the aforementioned cognitive gap. The purpose of the study was to analyze (from the perspective of medical patients) the potential impact of the language barrier and the information obtained about it on the perception of risk, as well as to analyze the impact of perceived risk on the respondents' attitudes and their intentions to use medical tourism services.

Research framework

Ajzen's basic TPB model (Ajzen, 1991) was adopted as the research framework. The results of previous studies show that TPB can be applied in the MT field (Lee et al., 2012; Seow *et al.*, 2017; Park *et al.*, 2017; Suki *et al.*, 2017; Reddy *et al.*, 2010; Martin *et al.*, 2011; Ramamonjiarivelo *et al.*, 2015).

H1:There is a relationship between attitudes toward medical tourism and intentions to use medical tourism.

In principle, the TPB model is open-ended, and its design allows the inclusion of additional predictors (Ajzen, 1991). According to the objectives of the study, the model was therefore extended to include the relationship between perceived risk and study participants' attitudes toward medical tourism services. As previous studies have shown, perceived risk can be an important factor influencing attitudes toward the use of medical tourism services, as confirmed in the TPB by among others (Seow *et al.*, 2017; Liang *et al.*, 2019; Hosseini *et al.*, 2023; Boguszewicz-Kreft *et al.*, 2022; Oh *et al.*, 2014; Crooks *et al.*, 2010). In this study, perceived risk is understood as psychological discomfort and anxiety (Huang *et al.*, 2008) and is considered in cognitive psychology terms, as the subjective feeling of negative consequences associated with traveling (Cui *et al.*, 2016).

H2: There is a relationship between perceived risk and attitudes toward medical tourism.

In addition, in the context of studying the impact of a potential language barrier on consumer decisions, the relationship between perceived risk and two more variables was also considered: the respondents' declared importance of the information they received about communicating with medical

personnel abroad and the importance of the risk of a language barrier in communicating with medical personnel abroad. Research on the relationship between perceived risk and language barriers in medical tourism has been conducted by, among others: (Crooks *et al.*, 2019; Tate, 2015; Hosseini *et al.*, 2023; Johnston *et al.*, 2011; Barwise *et al.*, 2024).

H3: There is a relationship between the importance of the risk of a language barrier in communicating with medical personnel and the importance of the information obtained about communicating with medical personnel abroad.

H4: There is a relationship between the importance of the information obtained about communicating with medical personnel abroad and the perceived risk of using medical tourism.

H5: There is a relationship between the importance of the risk of language barrier in communicating with medical personnel abroad and the perceived risk of using medical tourism.

The study also considered other variables describing the study participants (gender, age, place of residence and education) that could potentially moderate the relationship between perceived risk and attitudes toward using medical tourism services. The importance of these variables has been considered in studies by among others (Li *et al.*, 2022; Lubowiecki-Vikuk and Dryglas, 2019).

H6: Gender, age, education, and place of residence moderate the relationship between perceived risk and attitudes toward medical tourism.

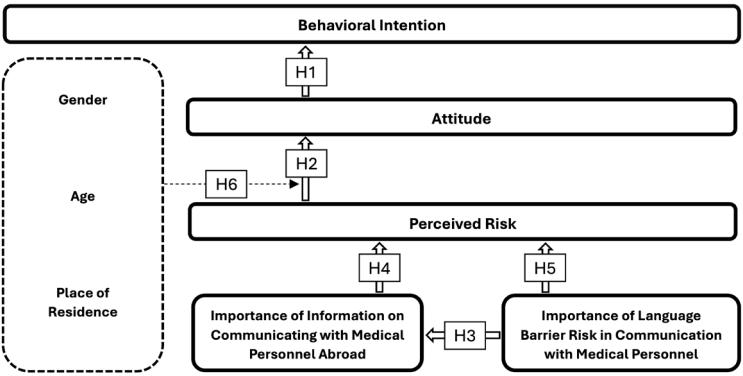
The model adapted for the study is shown in Figure 1.

The original data constituting the basis for the analyses were collected by CAWI among users of the online panel in October 2024. Through random-quota sampling, 1,146 Poles aged 18 and over were surveyed. The structure of the sample was adjusted using analytical weighting so that it corresponded to the structure of adult Poles in terms of characteristics relevant to the survey, such as gender (2 categories), age (5 categories), and size of place of residence (5 categories).

In accordance with the accepted theoretical framework of the study, a fully structured, voluntary and anonymous survey questionnaire was developed, consisting of questions based on constructs used in other studies (Table 1), supplemented by socio-demographic variables describing the respondents.

Statistical analyses were performed using the IBM SPSS Statistics 30 package and Process v. 4.2 macro.

Figure 1. *Research model*



Source: based on own research.

Table 1. *The main constructs of the model and measurement items*

Construct	Measures	Supporting References
Behavioral Intention	**If it were possible to travel abroad to receive treatment, I would consider doing so.** 7-degree Likert scale from (-3) "definitely no" to (+3) "definitely yes"	(Ajzen, 1991) (Reddy *et al.*, 2010)
Attitude	**Going abroad for medical services in my opinion is: (a) (harmful - beneficial); (b) (bad - good); (c) (unpleasant - pleasant); (d) (unprofitable - profitable); (e) (difficult - easy); (f) (inappropriate - appropriate); (g) (wrong - right)** 7-degree Likert scale from (-3) "definitely no" to (+3) "definitely yes"	(Ajzen, 1991) (Reddy *et al.*, 2010)
Perceived Risk	**In my opinion, going abroad for medical services is:** 7-degree Likert scale from (-3) "definitely risky" to (+3) "definitely safe"	(Cui *et al.*, 2016) (Huang *et al.*, 2008)
The Importance of Information on Communicating with Medical Personnel Abroad	**How would you rate the importance of information about communicating with medical personnel in the decision-making process of using a medical service abroad?** 7-degree Likert scale from (-3) "definitely not important" to (+3) "definitely important"	Kim, King (2009)
Importance of Language Barrier Risk in Communication with Medical Personnel Abroad	**How would you rate the importance of the risk of a language barrier in communicating with medical personnel in using medical services abroad?** 7-degree Likert scale from (-3) "definitely no" to (+3) "definitely yes"	Kim, King (2009)

Source: based on own research.

Data analysis

In the first step of the analysis, the distributions of the quantitative variables were checked. For this purpose, basic descriptive statistics were calculated, along with the Shapiro-Wilk test examining the normality of the distribution. The results of the analysis are presented in Table 2. The result of the Shapiro-Wilk test for all introduced variables proved statistically significant, which meant that their distributions significantly deviated from the normal distribution. However, it should be noted that the skewness of the distribution of these variables did not exceed an absolute value of 1, which meant that their distributions were asymmetric within a minor degree . Therefore, it was reasonable to conduct further analyses based on parametric tests, provided their other assumptions were met.

Table 2. *Basic descriptive statistics of the studied variables with the Shapiro-Wilk test (N = 1146)*

Variable	*M*	*Me*	*SD*	*Sk.*	*Kurt.*	*Min.*	*Max.*	*W*	*p*
Appraisal of the importance of information on communicating with medical personnel in the country of provided medical service	1,47	2,00	1,35	-0,59	-0,12	-3,00	3,00	0,87	**<0,001**
Appraisal of the importance of language barrier risk in communicating with medical personnel abroad	1,34	1,00	1,38	-0,62	0,12	-3,00	3,00	0,89	**<0,001**
Risk assessment of the use of medical services abroad	-0,62	-1,00	1,36	0,27	0,20	-3,00	3,00	0,93	**<0,001**
Attitude towards traveling abroad for medical services	0,72	0,71	1,06	-0,17	0,89	-3,00	3,00	0,97	**<0,001**
Assessment of intentions to travel abroad for treatment	0,91	1,00	1,52	-0,53	0,01	-3,00	3,00	0,91	**<0,001**

Annotation: *M – mean; Me – median; SD – standard deviation; Sk. – skewness; Kurt. – kurtosis; Min – minimum value; Max. – maximum value; W – result of the Shapiro-Wilk test; p – statistical significance for the Shapiro-Wilk test.*

Source: based on own research

In the next stage of the analysis, it was verified whether there were relationships between perceived risk, attitudes toward medical tourism and intention to use medical tourism. For this purpose, Pearson's r correlation analysis was performed, the results of which are shown in Table 3.

Table 3. *Correlation of perceived risk, attitude toward medical tourism and intention to use medical tourism (N = 1146)*

Variable	1.	2.
1. Risk assessment of the use of medical services abroad	-	
2. Attitude towards traveling abroad for medical services	**-0,74*** **	-
3. Assessment of intentions to travel abroad for treatment	**-0,49*** **	**0,63*** **

*** $p < 0,001$; ** $p < 0,01$; * $p < 0,05$*
Source: based on own research.

The analysis showed statistically significant negative associations between risk ratings of using medical services abroad and attitudes toward going abroad for medical services (conclusion consistent with H2) and Assessment of intentions to travel abroad for treatment. Also, a statistically significant positive association between attitudes toward traveling abroad for medical services and assessment of intentions to go abroad for treatment (conclusion consistent with H1).

In the next stage of the analysis, we verified whether there were associations between the importance of the information obtained about communicating with medical personnel abroad, the importance of the risk of a language barrier in communicating with medical personnel abroad and the perceived risk. For this, Pearson's r correlation analysis was performed, the results of which are shown in Table 4.

Table 4. *Correlation between the importance of information about communicating with medical personnel, importance of language barrier risk and perceived risk (N = 1146)*

Variable	1.	2.
1. Importance of information about communicating with medical personnel	-	
2. The importance of the risk of a language barrier	**0,50*** **	-
3. Risk assessment of the use of medical services abroad	**-0,20*** **	**-0,07***

*** $p < 0,001$; ** $p < 0,01$; * $p < 0,05$*
Source: based on own research.

The analysis showed statistically significant positive associations between the importance of the information obtained about communicating with medical personnel abroad and the importance of the risk of a language barrier in communicating with medical personnel abroad (conclusion consistent with H3).

In addition, the analysis showed statistically significant negative associations between the risk assessment of using medical services abroad and the importance of the information obtained about communicating with medical personnel abroad (conclusion consistent with H4). Furthermore, another negative association was found between the risk assessment of the use of medical services abroad and the importance of the risk of a language barrier in communicating with medical personnel abroad (conclusion consistent with H5).

In addition, it is noteworthy that the associations observed between the importance of the information obtained about communicating with medical personnel and the importance of language barrier risk were strong ($r > 0.50$), while the associations between the importance of the information obtained about communicating with medical personnel, the importance of language barrier risk and risk assessment were weak ($r < 0.30$).

The final stage of the analysis investigated whether gender, age, education, and place of residence moderated the relationship between perceived risk and attitudes toward medical tourism. To do so, four moderation models were created, where the first used gender (women vs. men) as the moderating variable, the second used age (<34 years vs. 35-54 years vs. >55 years), the third used education (no college education vs. college education), while the fourth used residence area size (rural vs. small or medium city vs. large city). The results are presented in Table 5.

The analysis showed that by adding age as a moderator to the model explaining attitudes toward medical tourism based on perceived risk, the percentage of variance explained increased by 0.4% ($\Delta R2 = 0.004$) and it was a statistically significant change ($F(1, 1144) = 9.96$; $p = 0.002$). To test the significance of the effect, regression analyses were conducted for explaining attitudes toward medical tourism based on perceived risk, separately among those aged up to 34 years, 35-54 years and over 55 years. It turned out that the model was a good fit to the data in all three age groups, that is the under-34 age group ($F(1; 276) = 202.77$; $p < 0.001$), the 35-54 age group ($F(1; 404) = 488.06$; $p < 0.001$), and the 55 and over age group ($F(1; 462) = 735.24$; $p < 0.001$).

Nevertheless, observing the values of the standardized Beta coefficient for the relationship between attitudes toward medical tourism and perceived risk, it can be observed that it was highest in the group of people over 55 years old

(β = – 0.78), was slightly lower in the group of people 35-54 years old (β = – 0.74), and was lowest in the group of people under 34 years old (β = – 0.65).

Table 5. *Results of regression analysis along with test results for the moderating effects of gender, age, education, and size of residence on the relationship between perceived risk and attitudes toward medical tourism (N = 1146)*

					95% *CI*	
Effect	***B***	***SE***	***t***	***p***	***LL***	***UL***
Regression constant	0,44	0,07	5,92	**<0,001**	0,29	0,58
Perceived risk	-0,60	0,05	-12,14	**<0,001**	-0,70	-0,51
Gender	-0,05	0,05	-1,07	0,287	-0,14	0,04
Perceived risk*Gender	0,02	0,03	0,58	0,560	-0,04	0,08
Regression constant	0,54	0,07	8,17	**<0,001**	0,41	0,67
Perceived risk	-0,45	0,05	-9,96	**<0,001**	-0,53	-0,36
Age	-0,08	0,03	-2,83	**0,005**	-0,14	-0,03
Perceived risk*Age	-0,06	0,02	-3,16	**0,002**	-0,10	-0,02
Regression constant	0,29	0,07	3,99	**<0,001**	0,15	0,43
Perceived risk	-0,66	0,05	-13,91	**<0,001**	-0,75	-0,56
Education	0,05	0,05	1,13	0,259	-0,04	0,15
Perceived risk*Education	0,06	0,03	1,80	0,072	-0,01	0,12
Regression constant	0,31	0,06	5,24	**<0,001**	0,19	0,43
Perceived risk	-0,60	0,04	-14,90	**<0,001**	-0,68	-0,52
Size of residence	0,03	0,03	0,99	0,325	-0,03	0,08
Perceived risk*Size of residence	0,01	0,02	0,62	0,537	-0,03	0,05

Annotation1. *B – unstandardized regression coefficient; SE – standard error; t – value of the t-test statistic; p – statistical significance; 95% CI – 95% confidence interval; LL – lower limit of the confidence interval; UL – upper limit of the confidence interval.*
Annotation2. *The dependent variable in each model is attitude toward medical tourism.*
Source: based on own research.

With gender as a moderator, the addition of the interaction made the percentage of explained variance in the constructed model increase by less than 0.1% (ΔR2 < 0.001) and this was a statistically insignificant change (F(1, 1142) = 0.34; p = 0.560). With education as a moderator, the added interaction made the percentage of explained variance increase by 0.1% (ΔR2 = 0.001) and again this was a statistically insignificant change (F(1, 1144) = 3.24; p = 0.072). In contrast, with the size of residence area as a moderator, the addition of interactions caused the percentage of explained

variance in the constructed model to increase by less than 0.1% ($\Delta R2 < 0.001$) and this was again a statistically insignificant change ($F(1, 1144) = 0.38$; $p = 0.537$). In summary, the analysis showed a statistically significant moderating effect only for age, so these are findings consistent with H6 in only one of the four moderating variables.

Discussion

Based on the theoretical framework of the Theory of Planned Behavior model, similarly to (Seow *et al.*, 2016; Liang *et al.*, 2019; Dash, 2021; Reddy *et al.*, 2010; Suki *et al.*, 2017; Park *et al.*, 2017; Martin *et al.*, 2011), the results of the authors' study showed that as the attitude toward going abroad for medical service increased, the willingness to use such service (behavioral intention) increased significantly.

The study also examined the relationship between perceived risk, attitudes and variables potentially moderating this relationship, such as gender, age, education, and area of residence. Analysis of the results showed that respondents' perceived risk of medical tourism services significantly influences both attitudes toward such services and the willingness to travel (however less strongly). The results indicated that as respondents' perceived risks associated with the use of foreign medical services increased, attitudes toward such services and intention to use them decreased. In addition, it is noteworthy that the two relationships observed for attitudes toward traveling abroad to receive medical services were strong ($r > 0.50$), while the relationship observed between perceived risk of using medical services abroad and perceived willingness to travel abroad to receive treatment was moderate ($0.30 < r < 0.50$).

The obtained results are consistent with the results of research by (Quintal *et al.*, 2010), although this study concerned tourism in general. They are also consistent with the results (Seow *et al.*, 2017) in the area of medical tourism precisely, where the authors demonstrated that the negative effect of perceived risk on attitude *enhances the ability of attitude in influencing tourists' behavioral intention.* Similar conclusions in this regard were also presented by (Dash, 2021; Hosseini *et al.*, 2023; Boguszewicz-Kreft *et al.*, 2022; Oh *et al.*, 2014) or (Yang and Nair, 2014).

In the process of analyzing demographic variables that could potentially moderate the relationship between perceived risk and attitudes toward using medical tourism services, gender, age, area of residence and education were taken into consideration. The analysis showed a statistically significant moderating effect only for age variable. The moderation effect showed that the strength of the association between attitudes toward medical tourism and perceived risk increased as the age of the respondents increased. The other tested moderation effects were found to be statistically insignificant, meaning that gender, education and size of residence area were not moderating the association between perceived risk and attitudes toward medical tourism. Similar findings regarding age as a moderator of the aforementioned relationship can be seen, for example, in a study (Dash, 2021) regarding medical tourism intentions in India. This research showed that perceived risk significantly influenced the attitudes of medical tourists, with age acting as moderating variables (older people showed greater concern, regarding perceived risk, which negatively affected their attitudes toward traveling for medical services). Consistent findings in this regard were also presented by (Yang and Nair, 2014) or (Boguszewicz-Kreft *et al.*, 2022), although in both cases only segments of young consumers were studied.

The final area of the analysis presented was to examine the relationship between three variables: the importance of the risk of the language barrier in communicating with medical personnel abroad, the importance of the information obtained about communicating with medical personnel abroad, and the perceived risk of MT service. The analysis also showed that as the importance of the language barrier increased, the perceived risk of MT services decreased according to the respondents. Looking for a logical interpretation of such a result, it is necessary to analyze all the relationships between the aforementioned three variables together. We can then see that as the importance of the language barrier increased, the importance of the information obtained about communicating with medical personnel simultaneously increased for the respondents. This is the authors' expected result, consistent with the results of other studies (e.g., (Zhao and Eskenazi, 2016; Tate, 2015), indicating that the importance (that is, most likely, also the need) for medical patients to seek the information in question increases with their growing

concern about the relevance of the language barrier while in a foreign medical facility. Following this line of thought, a consequence of the increasing importance of the language barrier with the increasing importance of the information obtained about this barrier is the decreasing risk perceived by such indicating patients considering using MT services. This may indicate that the importance of the information obtained in the decision-making process (here, information about a potential language barrier in communication with medical personnel) is so high that it may influence a reduction in the level of perceived risk accompanying the services in question.

Conclusions, practical implications and future studies

According to Ajzen's theoretical TPB model, attitudes toward medical tourism influence the intention of survey participants to use such services. The better the respondents' attitudes were, the greater the willingness to use TM services. In the context of expanding the TPB model to include perceived risk, it was confirmed that among respondents, perceived risk significantly affects attitudes toward medical tourism services and the willingness to travel abroad for this purpose. The higher the perceived risk, the lesser the attitude and the lower the tendency of respondents to use MT services. The age of study participants significantly affects the relationship between their perceived risks and their attitudes toward using medical tourism services. Older people showed greater concern, regarding perceived risk, which consequently negatively affected their attitudes toward traveling for medical services.

The importance of the risk of a language barrier in communicating with medical personnel abroad significantly influences the importance of the information obtained about communicating with medical personnel abroad, namely: the importance and need for the respondents to seek information, regarding the language barrier, increases with their increasing concern about the importance of this barrier during their stay in a medical facility abroad. In addition, it can be observed that a simultaneous increase in both of these variables significantly reduces the perceived risk of using medical tourism services.

This may indicate that the importance of the language barrier information acquired in the decision-making process is so great that such information may eventually become a type of reducer of perceived risk in medical tourism services.

In medical tourism, some offers may take the form of package tours subject to the provisions of the Act of 24 November 2017 on Package Travel and Linked Travel Arrangements (Journal of Laws 2017, item 2361), which implements the Directive (EU) 2015/2302 of the European Parliament and of the Council of 25 November 2015 on package travel and linked travel arrangements (Directive (EU) 2015/2302, 2015). Incorporating legal aspects into the analysis of consumer behavior is essential (Lubowiecki-Vikuk & Białk, 2025), as the sense of security resulting from legal regulations and consumer protection may reduce perceived risk and strengthen the intention to use medical tourism services.

In the context of creating demand for MT services, the above proposals should be considered by entities involved in the process of providing such services. Given the importance of the language barrier and the vital importance of patients obtaining specific information about this barrier, such entities could influence the overcoming of these barriers. They should, for example, develop and improve their communication policies in this regard, or, at a later stage of service provision, make more frequent use of the latest technologies supporting the overcoming of communication barriers, such as, for example, artificial intelligence (Barwise *et al.*, 2024).

Entities organizing medical travel should be aware that combining services (e.g., transport, accommodation, and medical procedures) may qualify their offer as a package tour, requiring compliance with the Act on Package Travel. Adherence to its provisions — particularly those concerning traveler protection and financial guarantees — along with effective communication and transparent information policies, fosters trust-building and the reduction of perceived risk in medical tourism.

From the perspective of the observed dynamic development of artificial intelligence tools and their noticeable global impact on many areas of human life, it would be of potentially high cognitive value to conduct further in-depth research on the use of AI capabilities, both at the stage of creating marketing communication programs and the process of providing medical tourism services itself.

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