


# Identifying Determinants for Traveled Distance and Bypassing in Outpatient Care: A Scoping Review

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## Abstract

The outpatient sector represents a growing share of health care. This review examines how patients choose their physician for continuous outpatient care and why they are willing to bypass the nearest physician. It was conducted according to the PRISMA extension for scoping reviews (PRISMA-ScR). Three databases (PubMed/Medline, ScienceDirect, and Ovid Medline) were searched, focusing on articles in which distance influenced the choice of physician. In all, 1,308 articles were accessed, and 17 selected for final review. First, we extracted methods for assessing distance traveled and bypassing. Second, we identified determinants that directly influence the traveled distance and transferred all into a conceptual framework. The center of this framework is the individual “willingness-to-go”, which reflects the willingness of patients to accept additional distances. Our findings can support studies on patient mobility and physician choice, which are essential for examining both the distribution and use of medical services, as well as for adequate need related planning.

## Keywords

health services research, mobility, bypassing, outpatient, physician choice, distance, review

### What do we already know about this topic?

Patients bypass physicians in many cases, which means that they travel past their nearest provider in order to receive treatment.

### How does your research contribute to the field?

Our findings can support studies on patient mobility and physician choice, which are essential for examining both the distribution and use of medical services, as well as for adequate need related planning.

### What are your research’s implications toward theory, practice, or policy?

In addition to distance and access, individual willingness-to-go should also be taken into account in need related planning.

## Background

Choice leads to competition which leads to higher quality. Whether this principle of the free market economy can also be applied to the health care market is controversially discussed in the literature.<sup>1-3</sup> Especially because health systems do not meet the classic requirements of competitive markets (e.g., symmetric information or zero search costs), transfer is a challenge.<sup>4</sup> As quality in health systems is a construct consisting of many different indicators, the relationship between competition and quality cannot be described as a simple association. Barros et al. conclude in their article on competition among health care providers that competition is likely to have different effects on the different quality indicators and

therefore can be both helpful and harmful at the same time. In terms of access, competition may affect equity. However,

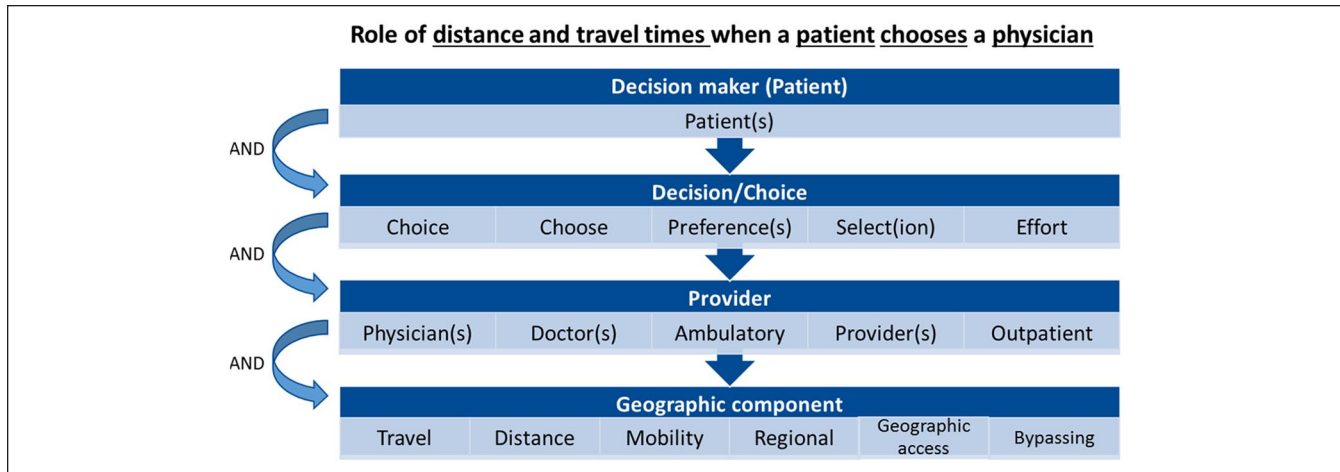
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**Figure 1.** Structure of the search string.

evidence on this is quite limited and mostly focuses on inpatient care.<sup>1</sup> In health care systems like in Germany or Belgium where patients are free to choose their provider, they can express dissatisfaction by simply changing their provider. This phenomenon was first described as “exit and voice”<sup>5</sup> and can also be expressed as “patients voting with their feet”.<sup>6</sup> As a consequence, the patients’ free choice should encourage physicians to provide high-quality services.<sup>7,8</sup> As a further contribution to high-quality care, the free choice of a provider is also an essential aspect with regard to patient participation, which strengthens patient autonomy in the sense of “shared decision making”.<sup>9,10</sup>

Especially in regions and specialties where an upcoming shortage of physicians can be expected, it is even more important to understand how patients choose their physician on a regional level and to determine local needs in more detail. In Germany, for example, providing comprehensive, uniform, and quick access to medical care is the major goal of health care planning (“need related planning”). However, currently it is assumed that people visit the nearest physician and it is not considered how patients choose their physician in reality. For this, it is essential to acquire knowledge about the reasons for the choice of physicians and on patients’ sensitivity to distance.<sup>11</sup> It has been demonstrated that patients bypass physicians in many cases, which means that they travel past their nearest provider in order to receive treatment.<sup>12-14</sup> There are different underlying motivations that depend on individual patient preferences and physician-related or regional factors.<sup>15</sup>

Medical travel is an example demonstrating that patients are willing to travel long distances in order to receive care. It is defined as crossing international borders to receive health care, mostly for elective services as dental treatment, reproductive treatment, or elective surgery and is increasingly exercised.<sup>16-18</sup> This demonstrates patients’ autonomy and willingness to gather information on health service provision and to spend a great amount of both time and money in order to receive treatment. However, medical travel is generally

distinguished from care sought for unplanned medical issues<sup>17</sup> and is therefore not taken into account in this article when discussing standard health care provision.

Patient mobility for hospital care has already been extensively investigated and recently summarized by Aggarwal et al. in a systematic review, who concluded that a significant proportion of patients are prepared to travel past their nearest provider (“bypassing”) and that the extent of patient mobility varied across the studies.<sup>19</sup> However, it remains unclear whether there are different determinants for bypassing when patients choose a practitioner for continuous outpatient treatment rather than a one-off treatment. We assume that especially people suffering from chronic diseases value certain factors more, such as doctor-patient relationship or continuity. Distance is also expected to be a more crucial factor because people have to travel this distance regularly. Considering the growing share of chronic diseases in the total burden of disease,<sup>20</sup> the provision of access to continuous outpatient care is even more of great importance. Thus, the objective of this review was to systematically explore how patients perform bypassing in a setting of continuous outpatient care. The role of distance and additional travel times in the process of physician choice shall be outlined and determinants of patient mobility shall be identified.

## Method

Literature on patient mobility in outpatient care is quite heterogeneous. For this reason, we decided to conduct a scoping review. This method allows summarizing findings from studies that differ in their methods. The review was conducted according to the PRISMA extension for scoping reviews (PRISMA-ScR).<sup>21</sup>

## Search Strategy

The literature research was performed in three databases: PubMed/Medline, ScienceDirect, and Ovid Medline. Articles

**Table 1.** Criteria for Study Inclusion.

Step	Inclusion criteria
Identification	Published within the last ten years, no later than July 2018 Available in English or German Abstract and full text available
Screening by title and abstract	Choice of physician AND Distance to the physician as contributing factor
Full-text screening	No inpatient care No one-off treatment

were included if they have been published within the last ten years but no later than July 2018, if they were available in English or German, and if both an abstract and a full text were available. The search string was derived from the study objective: “Role of distance and travel times when a patient chooses a physician”. It included relevant search terms for the four main components (Figure 1): (1) the decision maker (the patient), (2) the decision itself, (3) the provider, and (4) the geographic component. The search terms had to occur either in the title or in the abstract. The resulting search string was as follows (example for PubMed/Medline): (patient [TIAB] OR patients [TIAB]) AND (choice [TIAB] OR choose [TIAB] OR preference [TIAB] OR preferences [TIAB] OR select [TIAB] OR selection [TIAB] OR effort [TIAB]) AND (physician [TIAB] OR physicians [TIAB] OR doctor [TIAB] OR doctors [TIAB] OR ambulatory [TIAB] OR provider [TIAB] OR providers [TIAB] OR outpatient [TIAB]) AND (travel [TIAB] OR distance [TIAB] OR mobility [TIAB] OR regional [TIAB] OR geographic access [TIAB] OR bypassing [TIAB]).

### Study Inclusion and Charting of Data

After the exclusion of duplicates, the remaining articles were screened stepwise. Citavi 5 (Swiss Academic Software GmbH, Wädenswil Switzerland) was used as reference manager. First, all articles were screened by title and abstract. In this step, all articles that covered the choice of physician and additionally included distance to the physician as contributing factor were kept. In the second step, a full-text screening was conducted. Articles that focused on inpatient care as well as on one-off treatment were excluded (Table 1) as the focus was on treatments that require repeated visits. Two researchers conducted these steps independently, and disagreements were discussed until a common consensus was reached.

As proposed by Arksey and O'Malley,<sup>22</sup> a descriptive-analytical approach was chosen for data charting. Using this approach, a common analytical framework was applied to collect relevant information of the articles. This framework included the following: (1) descriptive analysis of the articles (discipline/setting, indication, number of investigated subjects, country, applied method), (2) assessment of bypassing (definition, proportion of bypassers, additional traveled

distance/time), (3) further factors potentially influencing traveled distance, and (4) further determinants of physician choice. Data charting was conducted by two researchers using the program Excel (Microsoft Corporation, Redmond USA). Finally, the extracted information was used to develop a conceptual framework showing the determinants of patient mobility.

### Results

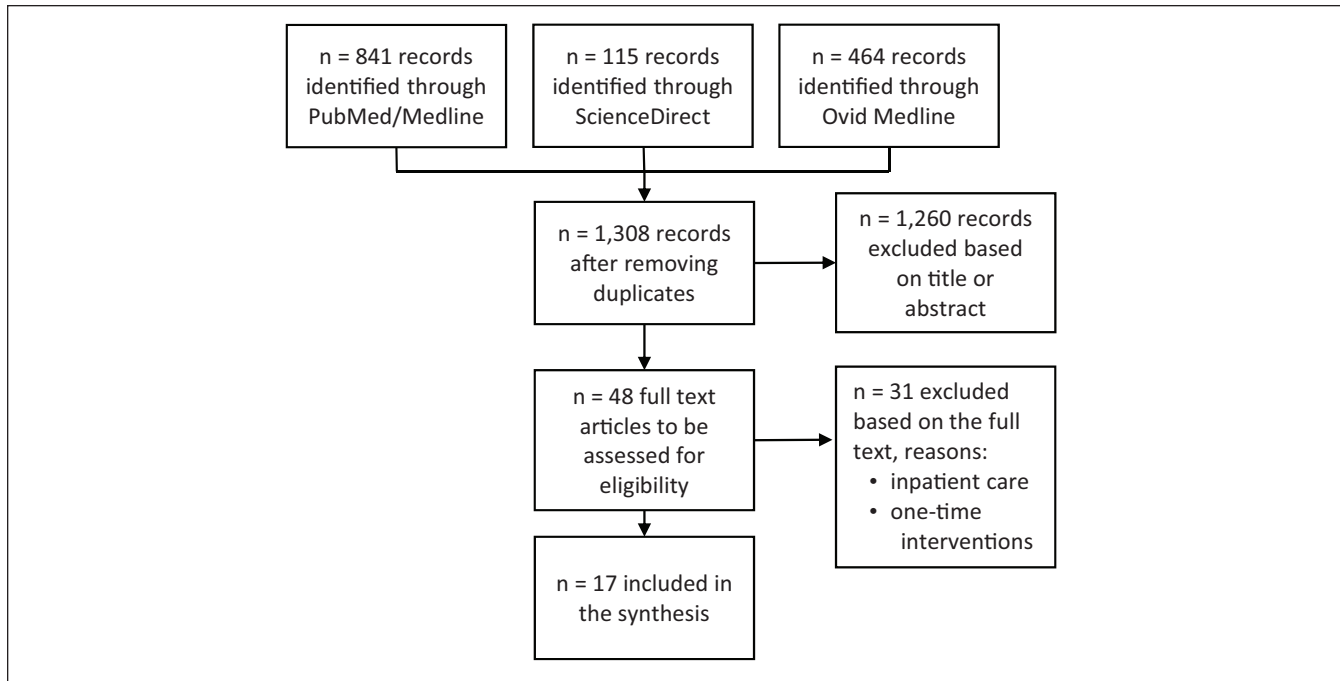
After the exclusion of duplicates, 1,308 articles were screened. The screening based on title and abstract resulted in 48 articles being eligible for the full-text screening. In the end, 17 articles were included in the review (Figure 2). The majority of the articles ( $n = 5$ ) came from the United States, followed by the United Kingdom, the Netherlands, and Germany with  $n = 2$  articles each.

Table 2 outlines the key characteristics of the studies including the respective setting and the methods used to assess patients' sensitivity to distance. Most of the studies used a questionnaire survey, sometimes including an instrument for the assessment of preferences, for example, a discrete choice experiment (DCE)<sup>23-25</sup> or conjoint analysis.<sup>26</sup> Furthermore, secondary data analyses<sup>27-31</sup> or telephone surveys<sup>32,33</sup> were conducted. Three articles used qualitative methods<sup>34</sup> or combined qualitative methods with quantitative data assessment.<sup>24,33</sup> Seven articles dealt with the choice of a primary care physician,<sup>23,25,27,28,33,34,36</sup> seven with secondary care,<sup>14,24,26,28,30,31,38</sup> and three with outpatient clinics.<sup>29,35,37</sup>

### Assessment of Traveled Distance and Bypassing

Three articles used the exact residential addresses of respondents and providers to calculate (additional) distances.<sup>14,27,32</sup> One study used the address of the provider and the postal code of the patient<sup>35</sup> and six the postal code or residential centroids of both the patient and the provider.<sup>23,26,28-31</sup> One study measured distance as travel time.<sup>36</sup> In six articles there was no calculation of actual distances at all,<sup>24,25,33,34,37,38</sup> but the role of distance was assessed and hence a general willingness to bypass the nearest provider could be assumed.

In six articles it was assessed whether patients exercised bypassing<sup>14,27,30-32,35</sup> (Table 3). In one further study actual



**Figure 2.** Flow chart of study selection.

**Table 2.** Descriptive Analysis of the Included Articles (Sorted in Alphabetical Order).

Article	Discipline/Setting	Indication	Number of investigated subjects (n)	Country	Method
Albada and Triemstra <sup>23</sup>	Primary care	Elderly and chronically ill people	1073	The Netherlands	Questionnaire survey with discrete choice experiment
Augustin et al. <sup>14</sup>	Dermatology	Psoriasis and chronic wounds	309	Germany	Questionnaire survey
Berkelmans et al. <sup>34</sup>	Primary care	Senior citizens	13	The Netherlands	Qualitative, semistructured interviews
Bhargava et al. <sup>26</sup>	Ophthalmology	Glaucoma	96	United Kingdom	Conjoint analysis
Birk et al. <sup>37</sup>	Outpatient clinics, multiple specialties	Not specified	2272	Denmark	Standardized questionnaire
Boachie <sup>36</sup>	Primary care	Not specified	496	Ghana	Questionnaire survey
Černauskas et al. <sup>25</sup>	Primary care in a low-income setting	Not specified	93	India	Questionnaire survey with discrete choice experiment
Fletcher et al. <sup>35</sup>	Outreach clinics	Pediatric cardiology	129	Scotland	Questionnaire survey
Godager <sup>27</sup>	Primary care	Not specified	14 993	Norway	Secondary data analysis based on a registry
Manning et al. <sup>38</sup>	Sports medicine	Not specified	382	United States	Questionnaire survey
Robertson and Burge <sup>24</sup>	Outpatient care	Not specified	2181	United Kingdom	Qualitative interviews and discrete choice experiment
Sanders et al. <sup>32</sup>	Primary care	Not specified	2540	United States	Telephone survey
Schang et al. <sup>28</sup>	Ambulatory care, different specialties	Not specified	518 million	Germany	Secondary data analysis of a full review of patient consultations in the statutory health insurance system

(continued)

**Table 2. (continued)**

Article	Discipline/Setting	Indication	Number of investigated subjects (n)	Country	Method
Wang et al. <sup>29</sup>	Outpatient clinics	Dialysis	70 131	United States	Secondary data analysis of the US Renal Data System
Ward et al. <sup>30</sup>	Oncology	Cancer	35 745	United States	Secondary data analysis based on a registry
Ward et al. <sup>31</sup>	Oncology	Cancer	25 611	United States	Secondary data analysis based on a registry
Wun et al. <sup>33</sup>	Primary care	Not specified	37 (focus groups); 1647 (telephone survey)	China	Focus groups and telephone survey

**Table 3. Assessment of Bypassing in the Included Articles.**

Article	Setting	Definition of bypassing	Proportion of bypassers	Additional distance/travel time
Augustin et al. <sup>14</sup>	Specialist care	Difference between chosen and nearest facility (based on concrete addresses)	not given	18.1 km
Fletcher et al. <sup>35</sup>	Specialist care	Identification of nearest facility based on patients' postcodes	47%	Not given
Godager <sup>27</sup>	Primary care	Identification of nearest facility based on a drive-time matrix	44% chose a general practitioner who is not among the 10 closest	Mean travel time to the closest general practitioner: 0.47 km; mean travel time with 10-19 bypassed general practitioners: 2.13 km
Sanders et al. <sup>32</sup>	Primary care	Respondents who traveled further than 15 miles to receive care, when there would have been other providers less than 15 miles away	39%	Not given
Ward et al. <sup>30</sup>	Specialist care	Comparison of travel time to chosen and nearest facility (based in ZIP code centroids)	¼ had a treatment facility within 22 minutes but rather traveled more than one hour	Mean realized travel time: 47.8 minutes; mean travel time to nearest facility: 13.8 minutes
Ward et al. <sup>31</sup>	Specialist care	Comparison of travel time to chosen and nearest facility (based in ZIP code centroids)	60.1%	27.9 minutes

bypassing was not assessed, but the theoretical willingness to bypass the nearest provider was analyzed.<sup>24</sup>

### Factors Influencing the Traveled Distance

Ten articles based their analyses on the assumption that traveled distance as an outcome can be explained by multiple factors.<sup>14,23-25,28,30-32,34,35</sup> These factors are summarized in Table 4. We assigned these factors to the categories “patient”, “quality of care”, and “access”. Additionally, the direction of association as it was reported in the corresponding article is given. For some determinants, for example, “higher education”, the articles were not consistent as to whether this determinant has a positive or negative effect on the distance traveled.

### Further Determinants of Physician Choice

In eight articles traveled distance was not the main outcome but one of the determinants that lead to the choice of a certain physician (ie, a predictor of physician choice). These further determinants are given in Table 5. In some cases, the determinants have been mentioned before as a factor that influences the traveled distance.

### The Role of Distance in the Process of Physician Choice

The objective of this review was to outline the role of distance in the process of physician choice. So far, we first identified factors that directly alter patients' sensitivity to distance

**Table 4.** Factors Determining Traveled Distance.

Area	Determinants	Article	Direction of association <sup>a</sup>	
Patient	Higher age	Albada and Triemstra <sup>23</sup>	-	
		Augustin et al. <sup>14</sup>	-	
		Černauskas et al. <sup>25</sup>	-	
		Robertson and Burge <sup>24</sup>	+	
		Sanders et al. <sup>32</sup>	+	
		Schang et al. <sup>28</sup>	+ -	
		Ward et al. <sup>30</sup>	-	
	Higher education	Ward et al. <sup>31</sup>	-	
		Albada and Triemstra <sup>23</sup>	+	
		Augustin et al. <sup>14</sup>	-	
	No car available	Černauskas et al. <sup>25</sup>	+	
		Robertson and Burge <sup>24</sup>	+	
		Albada and Triemstra <sup>23</sup>	-	
	Being female	Berkelmans et al. <sup>34</sup>	-	
		Robertson and Burge <sup>24</sup>	-	
		Albada and Triemstra <sup>23</sup>	-	
	Higher illness severity	Černauskas et al. <sup>25</sup>	-	
		Ward et al. <sup>31</sup>	-	
		Augustin et al. <sup>14</sup>	+ -	
		Fletcher et al. <sup>35</sup>	+	
	Higher income	Ward et al. <sup>30</sup>	+	
		Augustin et al. <sup>14</sup>	+	
	Self-reported health	Sanders et al. <sup>32</sup>	+	
Lack of time		Sanders et al. <sup>32</sup>	+	
Mobility impairment		Augustin et al. <sup>14</sup>	-	
Dissatisfaction with local care		Augustin et al. <sup>14</sup>	-	
Dissatisfaction with local shopping		Sanders et al. <sup>32</sup>	+	
Community fit		Sanders et al. <sup>32</sup>	+	
		Sanders et al. <sup>32</sup>	-	
Quality of care		Specialty	Sanders et al. <sup>32</sup>	+
		Doctor-patient relationship/ feeling well supported	Fletcher et al. <sup>35</sup>	+
			Augustin et al. <sup>14</sup>	+
			Augustin et al. <sup>14</sup>	+
	Bad past experiences	Fletcher et al. <sup>35</sup>	+	
	Competence of physician	Robertson and Burge <sup>24</sup>	+	
	Continuity of care	Augustin et al. <sup>14</sup>	+	
	Range of services	Berkelmans et al. <sup>34</sup>	+	
	Access	Degree of urbanity	Augustin et al. <sup>14</sup>	+
		Physician density	Robertson and Burge <sup>24</sup>	-
Sanders et al. <sup>32</sup>			-	
Schang et al. <sup>28</sup>			-	
Physician density		Ward et al. <sup>30</sup>	-	
		Ward et al. <sup>31</sup>	-	
Physician density		Schang et al. <sup>28</sup>	-	

<sup>a</sup>Factor is associated with a larger (+) or shorter (-) distance, and (+ -) indicates contradictory results between articles.

(Table 4). In the next step, we listed further factors that determine physician choice (Table 5). Additionally, we have found that traveled distance as an outcome indicates which factors are valued by a patient when he or she decides for a certain physician. Patients, for example, are likely to travel longer

distances in order to receive higher quality of care. In our conceptual framework (Figure 3), we called this individual sensitivity to distance “willingness-to-go”. This willingness is assumed to eventually determine the choice of physician. Factors that determine willingness-to-go can be assigned to



**Table 5.** Determinants of Physician Choice Apart From Distance.

Article	Determinants of physician choice
Albada and Triemstra <sup>23</sup>	Continuity of care (interpersonal and consecutive consultations) Accessibility Waiting time
Berkelmans et al. <sup>34</sup>	Continuity Accessibility Expertise and trust Kind and open attitude of the physician Information Proactive initiative Waiting times
Bhargava et al. <sup>26</sup>	Training of the health care professional Number of visits
Birk et al. <sup>37</sup>	General practitioner's recommendation Waiting time Personal experience Friend's experience
Boachie <sup>36</sup>	Availability of drugs Waiting time Clean environment Provider's reputation Charges Income
Černauskas et al. <sup>25</sup>	Appropriateness of care Familiarity with the physician Attitude of physician and staff toward the patient
Godager <sup>27</sup>	Similar observable characteristics of physician and patient Specialization Geographic location of physician Closeness to workplace
Manning et al. <sup>38</sup>	Board certification Reputation Physician age Availability of appointments Waiting time in waiting rooms
Wun et al. <sup>33</sup>	Treatment success/quick relief Specialization Practice hours Habit Family members seen by same physician Accessibility

the categories “patient”, “quality of care”, and “access”. Figure 3 illustrates these relationships between physician choice and willingness-to-go and the determinants identified in this review. It combines the previous findings of Tables 4 and 5. Some determinants were summarized under subheadings, for example, “sociodemographic factors” includes age, gender, education, and income.

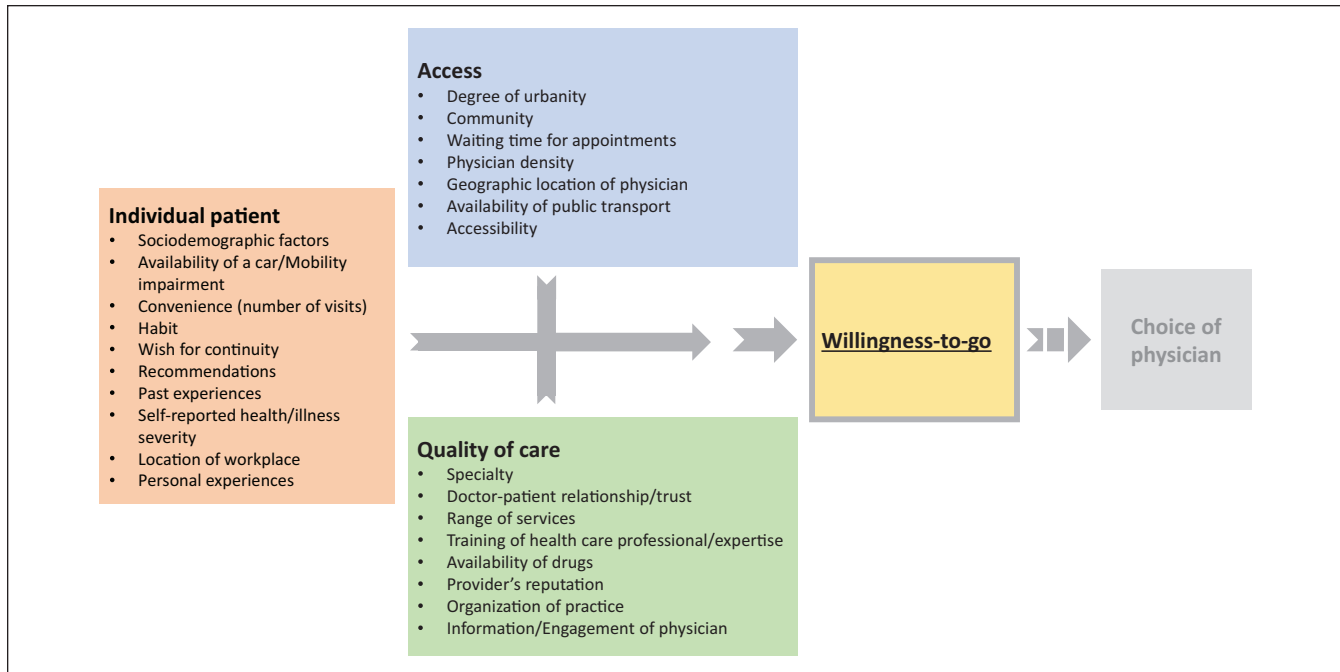
## Discussion

According to Robertson and Burge, offering a choice is necessary to provide high-quality treatment.<sup>24</sup> However, they also find that being offered a choice can be quite different from actively using it. Anyway, people use their right to choose<sup>37</sup> and this choice is not random.<sup>27</sup> To quantify this, research should differentiate between to what extent patients have to and want to travel further.<sup>28</sup>

This review describes the published literature on patient mobility and determinants of physician choice with a focus on continuous outpatient care. Our results underline that articles on bypassing in outpatient care are quite diverse. This diversity may result from the different health care systems in which the studies have been conducted, from different methods of data assessment, and different settings and patient groups. This heterogeneity also leads to a limitation of this review, as the results may be difficult to transfer and should therefore be adapted to the setting in which a study is conducted.

First, the focus of the studies differs. In some studies, the bypassed distance is the main outcome while others cover distance or travel time as one of many independent variables in their choice model. However, both identify similar determinants of physician choice. This leads to the assumption that distance should not be seen as a single outcome but is rather one factor in the process of physician choice. Still, it is a factor with a major impact on the choice which is why it should be measured or taken into account for planning of resources. Therefore, we included distance in our conceptual framework as preliminary indicator of physician choice. The determinants presented in the framework might interact with each other both within and across the categories. For example, the wish for continuity is most likely dependent on personal experiences of the patients but is at the same time expected to be altered by “access”-factors like the availability of public transport. This illustrates the complexity of the choice process. The interaction of these variables ultimately determines how important the distance to the physician is to a patient and therefore how sensitive he is to distance. As a consequence, extending the traveled distance on purpose, in other words bypassing, reflects somehow what a patient is willing to do for a certain treatment. According to the framework, this is called willingness-to-go.

Second, the degree of precision of the spatial assignment was very heterogeneous ranging from postal code level to exact measurement including addresses of both the patient and the physician, which has a consequence for the precision of the measured distance. However, precise addresses may be difficult to retrieve due to data protection regulations. Additionally, the most relevant means of transport should be ideally assessed when examining travel times. Also differentiating between acute and chronic care with a special focus on ongoing care is requested.<sup>28,37</sup>



**Figure 3.** Factors determining willingness-to-go.

Some of the factors that were identified as determinants of physician choice in this review have already been discussed in studies on mobility in inpatient care. As expected, the wish for high quality of care, the range of provided services, and the specialty of the physician were decisive for physician choice. It can be expected that quality of care is even more important in case of severe diseases. It was shown that the higher the severity of an illness, the longer the travel time.<sup>39</sup> As quality of care seems to be an important determinant of physician choice, it should be considered how a patient judges quality. Especially patients without a medical background might not be able to rate quality themselves but rather refer to other sources. The most common alternatives are to rely on friends' or families' experiences or recommendations<sup>36-38</sup> or using the internet. In the latter, it was shown that the way information is presented determines how it is understood and used.<sup>40</sup> However, it is important to not assume a perfectly informed patient but rather consider the information set of every patient.<sup>41</sup>

The important role of accessibility has also been demonstrated before.<sup>42</sup> The density of physicians and waiting times, both for appointments and in the waiting room, are also well-known determinants of access to care.<sup>43,44</sup> These have been shown to differ substantially on a regional level. Augustin et al.,<sup>45</sup> for example, revealed differences in the physician-patient ratio for dermatological care even within one city. These differences can be seen at the level of urbanization (urban vs. rural) and at the geographical level (e.g., east/west differences).<sup>41</sup> We categorized these factors under the heading "access".

The results discussed so far show some parallels to the findings of the review of Aggarwal et al. who focused on hospital care.<sup>19</sup> This focus is predominantly applied in research on patients' choice. However, the outpatient sector represents a large and growing share of health care which is why research should focus also on that.<sup>37</sup> The most apparent difference to inpatient care especially for chronic diseases is the ongoing nature of visits. It can be assumed that distance is an even more relevant factor in the decision-making process when several visits are needed. In addition, a patient might make a more considered decision in terms of quality aspects or the doctor-patient relationship if he plans to visit the physician for a long time to come. Accordingly, the number of visits was found to be a determinant for the choice of physician, and the wish for continuity made people accept longer distances.<sup>23,34,26</sup> Another factor that might be specific for continuous care is the influence of community fit on bypassing, which was raised by Sanders et al.<sup>32</sup> They found that people with many friends in the community and who are generally satisfied with their community in terms of general care or shopping are less likely to bypass their nearest provider. This association can be assumed to be stronger for regular visits, especially when the consultations are perceived as routine. The routine of the consultations also strengthens the influence of habit, which was also identified as a determinant.<sup>33</sup>

## Conclusions

If possible, patients use their right for free choice of physician. Our conclusion is that the extent of applied choice differs but



is not random and can be explained by the determinants identified in this review. These determinants predict the individual willingness-to-go, which is, among other factors, decisive for the choice of physician. The determinants can be summarized in a conceptual framework. This framework focuses on outpatient care including special underlying conditions, especially for chronic care. Distance and accessibility, however, are essential elements in the process of physician choice and should consequently be assessed carefully. Best practice for this would be the assessment and use of exact addresses and considering relevant means of transport as well as further determinants given in our framework. Next to the distance and access, individual willingness-to-go should also be considered in need related planning. In this respect, the objective of providing comprehensive care should be reconsidered. The knowledge gained on physician choice behavior and willingness-to-go demonstrates that current planning does not correspond to the reality of health services usage. Need related planning should be adapted accordingly in order to provide appropriate supply of health services. In addition, the results help to discuss which distances patients consider reasonable and whether this is consistent with the accessible provision of care.

What remains open is the association of the realized distance and the provision of higher quality of care resulting in treatment success. For this, longitudinal data on traveled distances to the physician and courses of the disease would be desirable.

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