International Diabetes Federation

The impact of travel distance, travel time and waiting time on health-related quality of life of diabetes patients: An investigation in six European countries

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ABSTRACT

Aims: The effects of travel distance and travel time to the primary diabetes care provider and waiting time in the practice on health-related quality of life (HRQoL) of patients with type 2 diabetes are investigated.

Research design and methods: Survey data of 1313 persons with type 2 diabetes from six regions in England (274), Finland (163), Germany (254), Greece (165), the Netherlands (354), and Spain (103) were analyzed. Various multiple linear regression analyses with four different EQ-5D-3L indices (English, German, Dutch and Spanish index) as target variables, with travel distance, travel time, and waiting time in the practice as focal predictors and with control for study region, patient's gender, patient's age, patient's education, time since diagnosis, thoroughness of provider-patient communication were computed. Interactions of regions with the remaining five control variables and the three focal predictors were also tested.

Results: There are no interactions of regions with control variables or focal predictors. The indices decrease with increasing travel time to the provider and increasing waiting time in the provider's practice.

Conclusions: HRQoL of patients with type 2 diabetes might be improved by decreasing travel time to the provider and waiting time in the provider's practice.

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1.   Introduction

The interaction between diabetes care provider and patient constitutes an essential component in diabetes care [1–4]. In this interaction the provider diagnoses the patient's medical condition; discusses with the patient the further course of treatment; gives access to drugs and other medical equipment; counsels the patient; and supervises the patient's adherence to the treatment. Without a functioning interaction between provider and patient the patient will not fully benefit from the rich medical knowledge regarding the treatment of diabetes. Therefore, a functioning interaction between provider and patient and, accordingly, appropriate access to the provider should be guaranteed. First of all, this access depends upon the insurance status of the patient [5–8]. However, even when diabetes treatment is free or at least affordable for everybody, access to the providers is not necessarily always the same for every patient. It might vary depending on the manner in which the service of the provider is delivered. It might depend upon the travel distance and/or travel time to the providers' locations and upon the temporal availability of the providers as determined by opening hours and waiting times.

There are currently few studies addressing location or temporal aspects of service delivery on health outcomes. There is some evidence that increasing travel distance to the primary diabetes care provider decreases glycemic control [9–11] and increases mortality [12]. There are no comparable studies addressing temporal aspects of service delivery. There is, however, one empirical evaluation of a program for reducing waiting times, i.e. advanced access scheduling [13]. According to this evaluation study, applying advanced access scheduling for one year leads to a slight improvement of glycemic control in comparison with clinics in which this program has not been applied.

The above studies provide very valuable insights. However, in seeking to optimize diabetes care with regard to needs directly experienced by the patients, it is not sufficient to focus solely on glycemic control as a target variable. Instead it is necessary to investigate how the different aspects of service delivery affect patients' health-related quality of life (HRQoL). Especially HRQoL in the sense of societal evaluations of the patients' overall health-states, i.e. evaluations which reflect the preferences of all members of the society, are of interest. HRQoL in this sense is needed as a basis for financial decisions pertaining to the health system. Accordingly, HRQoL in this sense is applied to compute Quality Adjusted Life Years (QALYs) in cost-utility analyses as they are performed in health-economics [14,15]. Hence, knowledge about the impact of aspects of service delivery in diabetes care on the patients' HRQoL in the sense of a societal evaluation would directly provide starting points for optimizing diabetes care with regard to the patients' needs in a cost-effective manner.

Measuring HRQoL in the sense of societal evaluations requires special instruments, i.e. preference-based index measurement instruments. Each instrument of this kind is based on a multi-attribute classification system for distinguishing health states, which is given by the questionnaire.

A further component of each preference-based index measurement instrument is a scoring function which assigns a societal evaluation to each health state distinguished within the classification system. The scoring function is given as part of the instructions for evaluating the corresponding answers and is determined on the basis of preference judgments given by a person sample which should be as representative of the society in question as possible [16]. As a prerequisite for computing QALYs, scoring functions are always standardized with 1 for full health and 0 for death [14,15]. The resulting value set is often referred to as an index [15,17].

The best known examples of preference-based index measurement instruments are the EQ-5D with its 2 versions EQ-5D-3L and EQ-5D-5L [18–20], the HUI with its 2 newer versions HUI II and HUI III [21,22], and the SF-6D [23,24]. Hitherto, the EQ-5D-3L is the most commonly applied of these instruments. The classification system of the EQ-5D-3L is defined by five questions which address 'Mobility', 'Self-care', 'Usual Activities', 'Pain/Discomfort', and 'Anxiety/Depression'. Three answer categories are given for each question. The first of these categories represents 'no problems at all'; the second 'moderate problems'; and the third 'extreme problems'. Presently there are 172 official language versions of the EQ-5D-3L [25] and several different scoring functions reflecting the preferences in different countries [26].

The contribution presented here aims at providing information as to how travel distance and travel time to the health care provider as well as waiting time at the health care provider's practice influence HRQoL indices based on the EQ-5D-3L. For this purpose data which were originally collected in a major European project concerned with health provider networks [27] were re-analyzed. In this project, surveys of patients with type 2 diabetes were conducted in networks for diabetes care from England, Finland, Germany, Greece, the Netherlands and Spain. The EQ-5D-3L was applied as a component of the survey questionnaire. There is empirical evidence that the items of the English, Finnish, German, Dutch, Greek and Spanish EQ-5D-3L version function in the same way [28]. As the results provided by the analyses presented here apply first of all to the six study countries, the EQ-5D-3L indices referring to these countries were used as far as scoring functions for computing such indices were presented in Medline listed papers and as far as these functions were empirically meaningful in the sense theory of measurement [17]. These were the indices for England [29], Germany [30], the Netherlands [31] and Spain [32].

2.   Material and methods

2.1.   Study regions, study participants and study conduction

One network in each country was investigated: the London Borough of Tower Hamlets in England; the region of Keski-Suomi in Finland; the city and rural district of Bamberg in Germany; the regional unit of Herakleion on the island of Crete in Greece; the region Nieuwe Waterweg Noord en Delft Westland Oostland in the Netherlands; and the region of Valencia in Spain. In England seven general physician practices