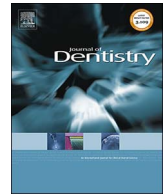




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Valuing the delivery of dental care: Heterogeneity in patients' preferences and willingness-to-pay for dental care attributes

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ABSTRACT

Objectives: To examine the amount of heterogeneity in patients' preferences for dental care, what factors affect their preferences, and how much they would be willing to pay for improvement in specific dental care attributes. **Methods:** A discrete choice experiment (DCE) was used to elicit patients' preferences. Three alternative dental care services that differed in the type of care provider, treatment explanation, dental staff behavior, waiting time and treatment cost were described to patients. Patients (n = 265) were asked to choose their preferred alternative. The study was conducted at a public dental clinic of the School of Dental Medicine, University of Zagreb. Mixed logit and latent class models were used for analysis.

Results: On average, the patients would be willing to pay €45 for getting a detailed explanation of treatment over no explanation. This was the most valued attribute of dental care, followed by dental staff behavior with marginal willingness-to-pay (WTP) of €28. Dental care provided by the faculty members and private dental care were valued similarly, while student-provided care was valued €23 less. Patients also disliked longer waiting time in the office, but this was the least important attribute. Four classes of patients with distinct preferences for dental care were identified. Older and/or more educated patients tended to give relatively less importance to treatment explanation. Higher education was also associated with a higher propensity to substitute faculty dental care with the private care providers.

Conclusions: Large heterogeneity in patients' preferences was detected. Understanding their preferences may improve the delivery of dental care.

Clinical significance: Dental care providers should pay particular attention to providing a detailed treatment explanation to their patients. Dental care for older and/or more educated patients should be more attentive to interpersonal characteristics. Faculty dental care provided by faculty members could be price competitive to private care, and student-provided care more affordable.

1. Introduction

Understanding patients' preferences for different types (public vs. private) and attributes of a health care service, and also factors that influence their preferences, is valuable for policy makers in developing health care programs and planning the provision of specific services [1]. Health care services, including dental interventions, usually involve difficult decisions on the optimal allocation of limited resources [2–4]. Conversely, only a limited amount of research examined patients' preferences or WTP for dental care, especially when delivered by the dental school clinics or through the public health care system in general [2,5–8]. As publicly funded health care is under increasing financial pressure, governments often encourage market-oriented

reforms and reduced state intervention [9]. Under such circumstances, public health care facilities, including dental school clinics, are often forced to seek alternative funding sources on the real market, such as introduction of fees or out-of-pocket payments for their services [8].

Stated preference methods, such as discrete choice experiments (DCEs), have been commonly used to elicit preferences of patients, to assign monetary values to (attributes of) health care services and to predict the uptake of specific services [1,3,5–7,10,11]. Discrete choice experiments describe a good (e.g. dental care treatment) in terms of a number of characteristics or attributes (e.g. waiting time, price of the treatment, etc.). The attributes can take different values, which are combined to describe different choice alternatives (e.g. 10 min waiting time and price of €10 vs. 20-min waiting time and price of €7). Two or

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more alternatives are offered in each choice set, and respondents are asked to choose their preferred alternative. Respondents' choices imply implicit trade-offs between the levels of the attributes they would be willing to make, which could be used to estimate the weight or relative importance people assign to various service attributes [12–14]. When the cost is included as an attribute, the marginal utility estimates from the DCE model can be converted into willingness-to-pay (WTP) estimates for improvements in the levels of other attributes.

A DCE was conducted to get deeper insight into the preferences of dental patients. A survey was administered at the dental clinic of the School of Dental Medicine, University of Zagreb, Croatia, which serves as a platform for student training. School clinic is a part of public health care system, so dental care is free of any out-of-pocket payments. The choice experiment investigated how much patients value different attributes of dental care and how much they would be willing to pay for specific improvements in the delivery of dental care, while accounting for the heterogeneity in patients' preferences. As patients often have diverse expectations and preferences for health care interventions, it is important to account for preference heterogeneity when analyzing the choices among alternative dental care services and deriving WTP estimates. Studies have shown that ignoring preference heterogeneity may bias the utility estimates derived from DCE study [11,15]. The amount of preference heterogeneity in the delivery of dental care and the factors that affect patients' preferences were examined by using the mixed logit and latent class models. These models can provide information on the underlying structure of heterogeneity, thereby supporting greater individualization of health care and identifying potential winners and losers of specific health care programs. Furthermore, a DCE model investigated to what extent, if any, patients prefer faculty dental care service over a service in private dental offices, and how would they respond to the introduction of service fees at the school clinic. Discrete choice experiments are considered particularly suitable for evaluating customers' responses to the hypothetical changes on the market. This is an important consideration, as health care managers often pay too little attention to the behavioral responses of patients when planning the changes in the delivery of health care [5].

The aims of this study were therefore to provide information on the optimal allocation of available resources at the dental school clinic, to support greater individualization of dental care and to provide an insight into the outcomes of different dental care programs. Considering these aims, this paper tried to answer the following: a) what is the relative importance and WTP for selected attributes of dental care delivery at the school clinic, b) if preferences for dental care are characterized by heterogeneity, and if potential heterogeneity could be explained by individual characteristics of patients, and c) how much the predicted uptake of alternative dental care providers would be affected by the changes in the attributes of dental care delivery at the school clinic. This information is indispensable in improving the service quality and setting the appropriate priorities in the provision of health care services.

2. Methods

2.1. Data collection

A survey was conducted at the School of Dental Medicine, University of Zagreb, Croatia. Ethical approval for the study was obtained by the Ethical Committee of the School. Patients who attended the clinic of the Department of Endodontics and Restorative Dentistry were surveyed from March 2016 to January 2017 by using a structured questionnaire. The initial sample selection was performed at the department appointment desk where patients were systematically allocated to one of the student groups led by a specific faculty member. Only one group was surveyed on a single data collection occasion, which was carried out at different times of the day during two different weekdays, depending on the student clinic working hours, throughout

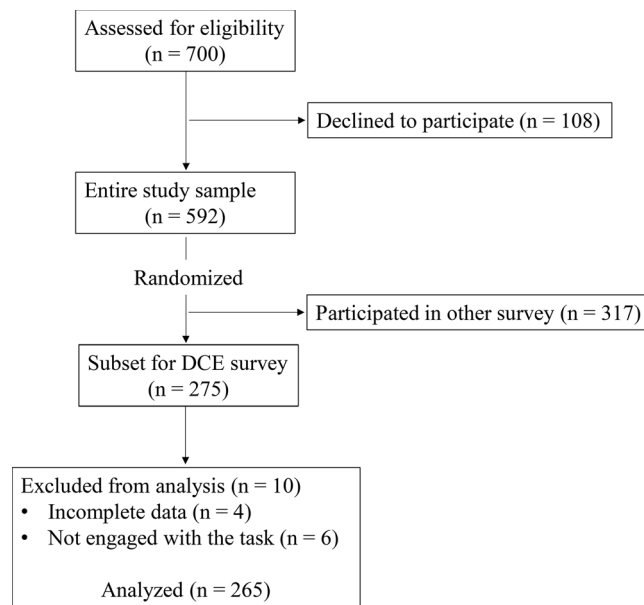


Fig. 1. Study flow chart.

the survey period. The main method of data collection was self-administration, but face-to-face interview was used in some cases (e.g. older respondents). Colgate toothbrushes and toothpastes were used as an incentive for respondents to participate in the survey. The response rate was 84%. A total of 592 questionnaires were collected. A split-sample design was used in which the order of questionnaires was randomized by using the proc plan procedure in SAS. Participants were allocated to either a DCE survey that evaluated patients' preferences or to a non-DCE survey that was used to evaluate patients' perceptions of dental care but was not well suited for examining preference heterogeneity or WTP for dental care attributes, and was therefore not included in the analysis presented in this paper (Fig. 1). Responses from 265 respondents were used in the analysis.

2.2. Questionnaire design

The paper-based questionnaire addressed the primary motivation of patients for having a dental care at the school clinic, followed by the perceived importance of selected dental care attributes and DCE tasks that evaluated patients' preferences for the attributes of dental care. After completing the choice tasks, they were asked follow-up questions on their decision behavior, certainty in choices and perceived choice task complexity. Choice task complexity was measured on a four-point Likert scale anchored by 1 = 'Very difficult to answer choice questions' to 4 = 'Very easy to answer choice questions', and choice certainty on a ten-point Likert scale ranging from 1 = 'Very uncertain' to 10 = 'Very certain' [6]. Final part of the questionnaire addressed the background information of respondents (age, gender, education, family income, perceived quality of faculty dental care and their experience with the dental care providers). The questionnaire was preliminary tested. A pilot study (n = 50) was conducted to ensure that patients find the choice attributes important, and that they understand and could manage the choice task at hand. After the pilot study, adjustments to wording and layout were made. The complete questionnaire is available from the authors upon request.

2.3. Selection of attributes for DCE study

Selection of the relevant choice attributes and their levels was based on the literature review, expert opinion of the faculty staff and the pilot survey. The literature was searched for studies focused on the choice of

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