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ON THE IMPORTANCE OF COMMUNICATION IN DENTIAL PRACTICE AND PREPARING DENTAL STUDENTS FOR THEIR PROFESSION BEYOND THE CLINICAL ASPECTS

PhD Thesis

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LIST OF PUBLICATIONS COVERED IN AND RELATED TO THE THESIS

Publications covered in the thesis

1. **Szabó RM**, Davis JM, Antal M. Introducing career skills for dental students as an undergraduate course at the University of Szeged, Hungary. BMC Medical Education 2020 Mar 6;20(1):68.

IF: 2.463 SJR ranking: Q1

2. **Szabó RM**, Farkas G, Keszeg M, Eördegh G, Buzás N, Antal M. A „kompromisszumos választás" szerepe a fogászati kezeléssel kapcsolatos döntések során. *676 magyar önkéntes részvételével végzett vizsgálat*. Orvosi Hetilap 2019 Sep;160(38):1503-1509.

IF: 0.497 SJR ranking: Q3

3. **Szabó RM**, Buzás N, Braunitzer G, Shedlin, MG, Antal, M. Factors Influencing Patient Satisfaction and Loyalty as Perceived by Dentists and Their Patients. *Dentistry Journal* **2023**, *11*, 203.

IF: 2.6 SJR ranking: Q2

Presentations related to the subject of the thesis

1. Réka Szabó, Márk Antal, Attila Rácz, Norbert Buzás. Dental patients' attitudes towards internet usage regarding dental treatment and communication In: The World Federation for Laser Dentistry (2020) Paper: 484

2. **Szabó Réka**, Farkas Gergely, Keszeg Mária, Buzás Norbert, Antal Márk. A „Középső választás" megjelenése a páciensek saját szájüregi egészségükkel kapcsolatos döntései során In: Szegedi Fogorvos Találkozó és Tudományos Konferencia, 2017 (2017) 40 p. Paper: 12

Introduction

Effective communication and the establishment of trust are crucial elements in the interaction between physicians and patients, influencing factors such as compliance and outcomes as reported in the literature. In the past, a paternalistic approach was prevalent, where practitioners offered necessary treatments and patients predominantly accepted the proposed solutions. However, in today's digital age with abundant online information, younger generations are increasingly eager to participate in decisions related to their health, altering the traditional patient role.

Patient experience and practitioner communication as part of the overall patient experience significantly contribute to therapeutic success or failure. Patient satisfaction has been reported to be a multi-factorial phenomenon, with a complex set of objective and subjective elements.

The study of "decision making" has gradually gained prominence in the last 20 years, with many psychological researchers now asserting that emotions play a pivotal role in most significant life decisions. This holds true for decision making in dental treatment, where emotions, assumptions, and preconceptions, alongside communication methods and professional information, influence the process. The outcomes of the decision-making process significantly impact patient satisfaction and loyalty. Heuristics, which are cognitive shortcuts for solving problems approximately when exact solutions are unattainable, enable decisions in situations with limited information. In dental settings, patients often must make treatment-related decisions, relying primarily on the price

as the available and comprehensible information to facilitate their informed choices. Even if dentists provide information, it can be challenging to translate this into layman's terms. Consequently, patients might resort to heuristics as their primary decision-making tool, which is not ideal. Hence, effective, clear, and informative communication between dentists and patients becomes paramount for satisfaction and loyalty in dental treatment choices.

At the same time, research indicates widespread patient dissatisfaction concerning the quality of communication with physicians. Thus, understanding patient preferences and refining professional communication in dentistry and broader medical practice is paramount for delivering high-quality care. Equally essential is the integration of such knowledge into undergraduate education, alongside the development of professional competencies. Furthermore, comprehensive education must address the practical challenges of the profession, including time management, work-life balance, managing private practices, and promoting mental well-being. The aim of such an education is to ensure that graduates can successfully navigate their profession not only as skilled professionals but also as well-rounded individuals. This approach creates a synergy wherein their proficiency as professionals and their personal well-being enhance each other, leading to an overall improvement in their professional capabilities. Consequently, dental schools worldwide have started incorporating these topics into their curricula. Addressing the non-strictly clinical challenges of dentistry, however, demands specific skills that cannot be effectively imparted within a traditional,

teacher-centered framework. Implementing a student-centered approach, however, can be challenging. To ensure our students are genuinely prepared for professional practice, innovative solutions must be devised.

Aims and hypotheses

In the first study[1] covered in this thesis, our primary objective was to investigate the key factors influencing patients' self-perceived satisfaction and loyalty in their dental care experiences. To achieve this goal, we developed a questionnaire based on existing literature, focusing on various aspects of their last visit to the dentist. The questionnaire included items related to patient experience and dentist communication, as well as general aspects like visit frequency, duration, quality, overall satisfaction, and loyalty. Our secondary objective was to assess the alignment between patients' experiences and dentists' perceptions regarding the significance of the same aspects influencing satisfaction and loyalty. For this purpose, we designed a specific questionnaire for dentists, comprising items that corresponded to those in the patient questionnaire but were phrased from the dentist's viewpoint.

Hypothesis 1: Our hypotheses were formulated based on findings reported in previous literature. Regarding the primary objective, we hypothesized that effective dentist-patient communication would significantly contribute to both satisfaction and loyalty.

Hypothesis 2: Concerning the secondary objective, we anticipated a generally high level of agreement across most items, with a few areas of disagreement.

In the second study, we sought to investigate the presence of the compromise effect in dental treatment decisions and

[1] See *Publications covered in the thesis* on page 2.

explore how this effect is influenced by dentist communication and supplementary information. Specifically, we aimed to assess whether the compromise effect manifested in dental choices based solely on price (referred to as price only or PO arrangements).

Hypothesis 3: We hypothesized that the compromise effect would be evident across all price categories in the absence of additional information.

Hypothesis 4: Furthermore, we anticipated that the introduction of extra details would modify this effect in a manner contingent upon specific scenarios and price categories.

The final study this thesis covers demonstrates our work in curriculum development. Our main aim was to demonstrate that a student-centered course aimed at preparing students for dentistry as a career fits well even in a predominantly teacher-centered dental curriculum, is welcome by the students and can transfer important practical knowledge that helps students on the way of becoming professionals beyond the clinical sense of the expression.

Hypothesis 5: We hypothesized that students would generally welcome the course, with the practical aspects being the most popular. Additionally, we expected that other aspects, particularly discussing one's strengths and weaknesses, would be less appreciated. These topics are uncommon in university courses and diverge from the educational culture our students were accustomed to.

Materials and methods

1. A total of 85 private dental practices across Hungary were approached via email and invited to participate in this cross-sectional study. Out of the 85 practices contacted, 41 agreed to participate in the study. These selected practices were provided with electronic versions of both the patient and dentist questionnaires for printing and on-site administration.

Initially, we developed the patient questionnaire comprising 31 items. Among these, six items focused on demographic information, while the remaining 25 items were adapted from existing literature on patient experience, satisfaction, loyalty, and practitioner-patient communication, or were utilized in their original form. Adaptation was necessary when an item was originally framed in the context of general medicine and referred to a "doctor" or "physician." In such cases, we replaced these terms with "dentist." After finalizing the questions for the patient questionnaire, we developed a corresponding dentist questionnaire comprising 19 items. Among these 19 items, 4 were dedicated to gathering demographic information, while the remaining 15 items were paired with those in the patient questionnaire. It is important to note that the dentist questionnaire was not designed as an independent instrument; rather, it served as a descriptive complement to the patient questionnaire. Its purpose was to provide additional insights from the dentist's viewpoint, enhancing our understanding of the patient-dentist dynamic. Prior to administering the questionnaires to the study participants, a pilot test was conducted, involving 25 dentists and 100 patients. The objective of this test was to

evaluate the questionnaire's reliability, internal consistency, and underlying factor structure.

2. An anonymous questionnaire was utilized to explore patient preferences. Eight distinct versions of the questionnaire were created, each containing different combinations of five dental treatment names, corresponding prices, and additional information. The categories of additional information were determined based on existing literature. All eight versions included the names of five different dental treatments and their associated prices (referred to as PO). However, additional information (AI) was provided in only four versions. The items were consistently presented as [xyz], [xy], [yz], or [xz], where x represented a low-priced, y a medium-priced, and z a high-priced option (this convention is used hereafter). Prices were calculated based on market rates in Hungary, ensuring that the medium- and high-priced options were double and triple the cost of the low-priced option, respectively. Each version of the questionnaire was completed by 84 to 102 participants. In the one-year timeframe altogether 676 participants completed the questionnaire.

3. Our course was designed with multifaceted objectives. These objectives were formulated based on Donald Super’s career development theory, providing a structured framework. According to Super's career lifespan theory, university students are placed within the specification phase (18 to 21 years of age) and the implementation phase (22 to 24 years of age) of the exploration stage (15 to 24 years of age). The primary goal

of the course is to assist students in shaping their career expectations and cultivating their professional identity. A secondary objective is to impart practical skills applicable during job applications. Upon completing this course, students should be proficient in crafting a CV and motivation letter, assembling their professional portfolio, and evaluating whether a potential workplace aligns with their personality, aspirations, and objectives. This multifaceted approach serves a dual purpose: first, research has demonstrated that thorough preparation, including organizing background materials and conducting research on prospective employers, can significantly enhance job interview outcomes. Second, activities related to the secondary objective complement and enhance the attainment of our primary goal.

Statistical analyses

1. Descriptive statistics and hypothesis tests

For the statistical analyses, IBM SPSS Statistics version 26.0 (IBM, USA) was used. Continuous variables were descriptively characterized using means, standard deviations, and 95% confidence intervals. Likert-type responses were treated as continuous variables since they represent degrees rather than discrete choices. Categorical variables were described using frequencies. Regression analysis was utilized for hypothesis testing concerning the influencing factors of satisfaction and loyalty. In these regression models, items 11 (pertaining to overall satisfaction) and 12 (relating to loyalty) from the patient questionnaire served as dependent variables, while the remaining items, including items 25 to 28 that explicitly addressed specific aspects of satisfaction, were considered independent variables. Additionally, demographic factors of practitioners (age, sex, location, and professional experience in years) were incorporated into the analyses. Considering the literature's suggestions that various demographic concordances between practitioners and patients (such as same sex or close age proximity) could impact the overall patient experience (45, 90), three additional variables (location concordance, sex concordance, and age difference) were calculated and included as independent variables.

Dentist-patient comparisons

Agreement between dentists' and patients' responses was assessed using two methods. Firstly, we identified the

statements (items) that received the least and most agreement from respondents. To achieve this, we calculated the 25th and 75th percentiles for the mean scores of all Likert-type items. Items scoring ≤ the 25th percentile limit were considered the least agreed upon, while items scoring ≥ the 75th percentile limit were considered the most agreed upon. Secondly, we introduced the variable "degree of disagreement" (DD), calculated for all 1121 dentist-patient response pairs across the 15 matched item pairs, irrespective of their significance in the satisfaction and loyalty analyses. DD was computed as follows: if the patient's score (PS) was lower than the dentist's (DS), we subtracted PS from DS and multiplied the result by -1 to indicate the direction of disagreement. Conversely, if PS was higher than DS, we subtracted DS from PS. A negative value denoted that the dentist rated the item higher, whereas a positive value indicated a higher score given by the patient. A score of 0 represented complete agreement, while full disagreement was represented by either -4 or +4. Regardless of sign, higher values signified greater disagreement. At the item pair level, DD was expressed as the mean of all DD values for the specific item pair, along with standard deviation (SD) and a 95% confidence interval (CI). Additionally, for each matched item pair, percentages of dentist-patient responses in full agreement and full disagreement were also calculated.

2. Statistical analyses were conducted in SPSS 21.0 (IBM, USA). Relative frequencies of choices were calculated, and the significance of association between the frequencies and the availability of the additional

information was determined by the chi-square and Fisher's exact tests.

3. Mean scores were computed as the simple arithmetic average of individual ratings given by each student, ranging from 1 to 5. A higher mean indicates a higher average agreement with the specific statement (excluding negative controls). An initial ANOVA revealed no significant differences between Hungarian and English-speaking students for any of the items (at $p < 0.05$). Consequently, the two groups were analyzed collectively. This approach was chosen as Hungarian students constituted the majority in our sample (~72%), rendering a separate analysis meaningless. Results were also assessed based on question sets (pertaining to the five main aspects mentioned earlier) by calculating the overall mean of all items. All calculations were conducted using SPSS 21.0 (IBM, USA).

Results

1. In the first study, our primary objective was to investigate the specific aspects of patients' dental care experiences that had the most significant influence on their self-perceived satisfaction and loyalty. Additionally, we aimed to compare the perspectives of patients and dentists on various issues related to patient experience and the patient-dentist relationship. All our hypotheses were validated: effective communication, particularly focusing on language use and clear explanations, emerged as a significant contributor to patient satisfaction and loyalty. The most crucial factors were the proximity (territorial location) of the dentist's office, the perceived quality of the treatment, the patients' trust in the dentists' decisions, satisfaction with the frequency of visits, the understandable explanation of the treatments, the dentist's interest in the patient's symptoms, the patient's attachment to the dental staff, as well as the dentist's knowledge of the patient's medical history. Moreover, there was generally a high level of agreement between what dentists considered important in the dental experience and what patients expected. However, there were distinct areas of disagreement. This can draw attention to areas where further improvements are needed to increase patient satisfaction.

2. Based on the findings of our second study, individuals do not approach dental decisions solely based on heuristics by default. It appears that they carry preconceived notions regarding dental treatments, with price being just one of the factors they consider. Additional information plays a role in enriching the

context of these decisions, rather than solely guiding patients away from heuristics. Aesthetic concerns prove to be paramount, and expected lifespan also stands out as information patients can effectively factor into their decisions. It's noteworthy that both factors are easily graspable even for non-professionals. In contrast, technical terms are ineffective, as are details about novelty or invasiveness, both of which presume a certain level of background knowledge. In essence, the general conclusion is that supplementary information does influence patients' treatment choices, but only when the interpretation does not necessitate specialized knowledge. The results unequivocally demonstrate that supplementary information can and does impact patients' dental treatment choices, provided it is presented clearly, appropriately, and in an understandable manner.

3. Regarding our third study, students expressed high satisfaction with the course, with practical elements such as CV writing and motivation letters receiving some of the highest ratings. Upon detailed analysis of specific items, the course's interactivity and the opportunity to learn effective CV writing emerged as the most valued aspects. Among the top five highest-scoring items, three were related to practical aspects, while the remaining two assessed overall satisfaction. Conversely, items related to personal characteristics and personal growth tended to receive lower scores. This result might reflect the fact that Hungarian students (or students studying in Hungarian higher education) are not used to being given the chance to look at themselves as significant actors in a university course. This outcome could also imply that evaluating the

use of self-knowledge and various psychological skills is inherently more challenging than assessing a CV or a motivation letter. Crucially, our student-centered course performed remarkably well within a traditionally teacher-centered educational framework, where university students are seldom urged to actively engage in courses.

4. Conclusions

Based on the results of the studies covered in this thesis, we draw the following conclusions, which we consider to be the novel scientific findings of the presented work:

1. Effective communication, trust, and the establishment of personalized rapport between patients and dentists emerge as pivotal factors in enhancing patient satisfaction and fostering long-term loyalty. In this respect, our hypotheses have been confirmed. Moreover, there was generally a high level of agreement between what dentists considered important in the dental experience and what patients expected, though there were distinct areas of disagreement. Our results suggest that local factors may significantly influence patient satisfaction and loyalty, emphasizing the importance of context-specific insights in shaping the patient experience.

2. As an additional finding we can conclude that tailoring visit frequency to meet individual patient needs has an impact on both satisfaction and loyalty.

3. Contrary to our initial hypothesis, patients' dental treatment choices do not seem to be determined by the compromise heuristic by default, even if they have no other information at their disposal than the name of the treatment and the prices of the different options.

4. Additional information can and does influence informed dental treatment choice on the patient side, provided it is offered in a clear, proper, and intelligible form, which, again, points out the importance of professional communication. Thus, our hypothesis regarding the effect of additional information has been confirmed.

Furthermore, our study revealed that expected lifespan and aesthetics emerged as crucial pieces of additional information in patient preferences.

5. Regarding curricular development study, our hypotheses have been confirmed. Our course met the expectations. The results show that it is feasible to introduce a student-centered career counseling course even in a traditionally teacher-centered and primarily clinically oriented dental curriculum.

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