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

PhD Thesis

Réka Magdolna Antal-Szabó

Supervisor:

Dr. habil. Norbert Buzás Ph.D.

Department of Health Economics

Albert Szent-Györgyi Medical School

University of Szeged

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LIST OF PUBLICATIONS COVERED IN AND RELATED TO THE THESIS

I. Publications covered in the thesis

1. Szabó RM, Buzás N, Braunitzer G, Shedlin, MG, Antal, MÁ. Factors Influencing Patient Satisfaction and Loyalty as Perceived by Dentists and Their Patients. *Dent J* **2023**, *11*, 203.

IF: 2.6   SJR ranking: Q2

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

IF: 0.497   SJR ranking: Q3

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

IF: 2.463   SJR ranking: Q1

Summed IF: 5.56

II. 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

LIST OF ABBREVIATIONS

AI – added information

CR – crystallization

CV – Curriculum Vitae

CV/P/M – Curriculum Vitae, portfolio, motivation letter

D – dentist questionnaire

DD – degree of disagreement

DMD – Doctor of Dental Medicine

DS – dentists' score

ES – information on esthetics

EU – European Union

GEN – general impressions

IMP – implementation

IP – implementation practice

JF – job fair

LS – expectable lifespan

MO – information on how modern the given method is

OT – the possibility of keeping one's own teeth with filling

P – patient questionnaire

PERS – personality and self–knowledge

PhD – Doctor of Philosophy

PO – price only

PP – practical preparation

PS – patients' score

SP – specification

TECH – career-related techniques

TO – task to be completed outside the class

TP/C – theoretical preparation/contemplation

TT – technical term

UK – United Kingdom

1. 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 (1). Mullen suggests that patients who are well-informed tend to experience better outcomes and demonstrate higher treatment adherence (2). In the past, a paternalistic approach was prevalent, where practitioners offered necessary treatments and patients predominantly accepted the proposed solutions (3). This dynamic can be attributed to the information imbalance between healthcare professionals and non-professional parties in doctor-patient communication, as highlighted by Elwyn (4). 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 (1). At the same time, research indicates widespread patient dissatisfaction concerning the quality of communication with physicians (5-9).

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. The research underpinning this thesis contributes to the existing body of knowledge in these areas.

1. 1. The effect of communication on patient satisfaction and loyalty

Patient experience and practitioner communication as part of the overall patient experience are key factors of patient adherence (10, 11), which means that these factors significantly contribute to therapeutic success or failure. It holds particularly true in the case of dentistry. While there exist numerous recognized medical phobias (12-15), odontophobia or dental fear ranks among the five most prevalent fears(16-18). This interferes with attendance (19, 20), and complete avoidance of the dentist may well be regarded as the ultimate therapeutic failure (with profound effects on the oral health of the public). Therefore, in dentistry, it is of utmost

importance to provide a patient experience that leads to satisfaction, positive attitudes toward the dentist and the practice, and, in turn, a willingness to regularly attend. This has been frequently studied in the context of general practice (10, 21-25), but less frequently regarding dentistry (26-28).

Patient satisfaction has been reported to be a multi-factorial phenomenon, with a complex set of objective and subjective elements (29). Studies have reported that the quality of dentist-patient communication is related to patient satisfaction (29-31). In the field of general medicine, studies have pointed out that patients prefer to be involved in the decision-making (32-34), and the few studies that are available on this specific question in dentistry, show the same (35, 36). It is also known that the perceived service quality influences patient loyalty through the effect of patient satisfaction which plays a key role in promoting patient loyalty (37).

Numerous studies have stressed the importance of communication in dentistry (38-40) and a few important conclusions have already been drawn regarding the success of dental communication. It has been shown that verbal communication in itself can influence patients' satisfaction with treatment outcomes (41). However, some studies indicate that dentists do not exploit this potential. For instance, Rozier and colleagues, in a large-sample, national-level survey, showed that US dentists utilized a narrow range of communication strategies and recommended more professional education in this area (42). The quality of communication between the medical professional and the patient might be influenced by certain demographic and personal factors and concordances (43). In a general medical setting, race concordance between the physician and the patient was found to result in longer visits characterized by more patient-positive affect (44). Similar conclusions were drawn in connection with shared personal beliefs and values (45). It is interesting that the gender of the dentist or physician also appears to be a key factor. Riley III et al. found that a male dentist was less likely to be aware of the importance of sharing information about the procedure to be performed than a female dentist (29). The authors also reference Hall et al. (46), suggesting that healthcare providers may offer additional information and support to female patients. This is not necessarily due to assumptions about the health needs of women, but rather because female patients tend to openly express their feelings, concerns, questions, and preferences during discussions about medical choices. In addition, Thornton et al. suggest that sex concordance and age concordance can influence the quality of communication between the physician and the patient (47). While the sex effect is well-known and studied (46, 48, 49), the effect of age and age discordance has been studied less often (28). Several specific characteristics that determine good dentist-patient

communication and lead to greater patient satisfaction have also been identified. To mention just a few: most of the studies dealing with this topic found that a good explanation of the condition and its treatment is of utmost importance (22, 29, 50). The treatment plan should be formulated through discussion and agreement (22). It is similarly important that the dentist should explain what is going to happen before starting the procedure (50) and that the dentist should show interest when the patient is talking about his or her problems (22). Finally, the importance of communication in dentistry is shown by the results of Lamprecht et al., who, in their study of patients' criteria for choosing a dentist, found that dentists' psychosocial skills appear to be the most important criteria for choosing a dentist (51).

Extra-communicative factors that may contribute to patient satisfaction and loyalty include trust in the physician's judgments regarding one's care and a good personal relationship between the patient and the care provider (24) or the patient's level of knowledge about the healthcare services (52). These factors and many others have been identified in different social and cultural settings, so they do not necessarily apply to any patient population.

An additional problem is that the opinions of the patient and the dentist regarding optimal and desirable dentist-patient communication may differ. Riley III et al. asked 197 dentists and their 5,879 patients about patient satisfaction, seeking to identify concordance patterns (29). Most of the patients were highly satisfied and the dentists correctly predicted this. However, among patients who were less than satisfied, there was a substantial subset of cases where the dentist was not aware of the patient's dissatisfaction. It follows that to have a realistic picture of dentist-patient communication that can inform practice, the perspectives of both parties should be examined and compared (53-55).

1. 2. The effect of communication on decision making and the „compromise effect"

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 (56-59). 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. These methods have piqued interest in consumer research, especially as average consumers rarely possess all pertinent information about products offered

for purchase. While the compromise effect is well-documented in marketing, it is seldom explored in medical contexts. 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.

The compromise effect, a heuristic in decision-making, leads to a significant increase in the attractiveness and probability of choosing alternatives when they represent a compromise choice (60). Research indicates a tendency to favor the middle option, if available, a phenomenon well-documented in product placement contexts (61, 62). Remarkably, Rodway and colleagues demonstrated that this effect is powerful enough to influence choices even in questionnaires (63). Formally illustrating the compromise effect, consider options [x, y, z] described along two dimensions. [x] dominates in one dimension, and [z] dominates in the other. The middle option, [y], is not dominant in either dimension nor similar to the other two. According to the compromise effect, [y] becomes more preferred when presented within the set [x, y, z] compared to either [x, y] or [y, z]. This contradicts both the principle of betweenness equality (64) and the substitution effect (65), which suggest that a newly added option should suppress preference for the original options based on their similarity. The compromise effect stands as a robust deviation from rational choice. Notably, individuals with more comprehensive information are less likely to rely on compromise as a heuristic (66).

Everyday products offer abundant product-related information from diverse sources. However, dentistry operates within a highly specialized context. 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.

1. 3. Implementing student-centered career counseling into a teacher-centered dental curriculum

It is a generally accepted aim that the undergraduate dental curriculum should prepare graduates to enter practice (67). However, the definition of readiness for practice varies based on what a specific curriculum considers practice-related. In fact, dentistry is an inherently demanding profession, which necessitates a broad spectrum of non-clinical skills, as indicated by both literature and practical experience. Good communication has been pointed out as one of those

skills. However, such higher-level soft skills can develop and work efficiently only if one has a real image of what it means to be a dentist beyond the technicalities of the profession and if one has a clear image of themselves within this reality. A perspective of one's own as a developing professional is inevitable.

Moreover, as aptly summarized by Myers and Myers, 'It's difficult being a dentist'(68). This difficulty arises not only due to various health hazards (69-73) but also because dentists face challenges in striking a balance between work and family life (74). Additionally, dentists must possess competence in non-medical aspects of their practice, such as financial planning, addressing legal issues, personal time management, and organizing their practice. Studies have highlighted that both dentists and dental students find these practical matters challenging (75). It is unsurprising that dentists experience high levels of stress, regardless of specialization (76). Prolonged stress can lead to alcohol-related problems (77), burnout (78), and, in severe cases, even suicide (79). 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. Resistance to change in higher education is a well-documented phenomenon (80). When examining faculty perspectives, Brickner categorized barriers to change into first-order and second-order obstacles (81). The former encompass external factors like inadequate time for instructional planning and lack of support, while the latter involve internal factors such as beliefs about teaching and learning, strong adherence to established classroom practices, or simply an unwillingness to change (82, 83). As for the students, they are often socialized and accustomed to being passive recipients of academic information (84). Jain et al. (85) emphasize that in many Asian countries, teaching predominantly follows a teacher-centered model, where students passively receive information and memorize it. Although such students might find taking an active role uncomfortable, they frequently find the passive learning approach unsatisfactory. In essence, there is a simultaneous desire for change alongside resistance to it. The problem is also salient in post-socialist countries like Hungary, owing to the historical imposition of stringent state control over higher education during the socialist era (80). This centralized approach, rooted in ideological principles, fostered a norm where individual attention was systematically overlooked in higher education practices. Overcoming this legacy is undeniably challenging.

However, to ensure our students are genuinely prepared for professional practice, innovative solutions must be devised.

2. AIMS AND HYPOTHESES

In the first study covered in this thesis[1], 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 (10, 22, 24, 50, 52, 86), 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 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.

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[1] See *Publications covered in the thesis* on page 4.

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.

3. MATERIALS AND METHODS

3.1. Communication, patient satisfaction and loyalty

3.1.1. Participants, study procedures and data processing

A total of 85 private dental practices across Hungary were approached via email and invited to participate in this cross-sectional study. Our selection of practices was not based on specific criteria; instead, we contacted all 85 private dental practices for which we had contact information.

The sample size calculation (for the necessary number of participating patients) was performed using G*Power 3.1 (Universität Düsseldorf, Germany). Assuming a multiple linear regression analysis, a significance level of $p<0.05$, a medium effect size ($f^2=0.15$), and the inclusion of 32 independent variables, the required sample size was estimated to be N=214. However, in the final analysis, our sample size was N=1121, resulting in an achieved power of 1.0 ($\lambda=168.15$, critical F=1.45).

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. Clear instructions on how to administer the questionnaire were included. The participants, whether dentists or patients, were given the option of consulting with the researchers either online or in person at any point during the process. In each practice, a dental assistant was assigned the responsibility of overseeing the questionnaire administration to both dentists and their patients. The questionnaire sessions took place in a quiet room, where the participant, whether a dentist or a patient, was left alone to complete the questionnaire. Brief instructions, also available in writing on the questionnaire itself, were provided before the participants filled out the forms. Once all questionnaires within a practice were completed, they were returned to the researchers, who then entered the responses into an Excel sheet. Care was taken to ensure that a patient's response to a specific item was always matched with that of his or her dentist, enabling the calculation of agreement between dentists and their patients. After receiving all questionnaires from the participating dentists, the dataset underwent a cleaning process. Data from dentists with fewer than 5 patients were removed, along with their patients' data. Subsequently, the questions were coded for the blinded analysis. The coded datasheet was then sent to the independent evaluator for further analysis (refer to the Statistical analysis section for details).

Participation in this study was entirely voluntary and completely anonymous for both the dentists and their patients. All dentists within the participating practices were given the opportunity to complete the questionnaire and invite their patients to participate, making the recruitment process entirely self-selective. The study's participant selection criteria included active dental practitioners from the involved dental practices and patients who willingly volunteered, were native Hungarian speakers, and possessed the necessary cognitive capacity to understand the study's objectives and questionnaire content. Exclusion criteria were applied to individuals lacking the ability to provide informed consent or having limited cognitive abilities to comprehend the study materials. Both the dentists and patients provided their consent by signing an informed consent form. These forms were stored separately and did not contain any identifiers linking them to the questionnaires. The practice manager invited the dentists to participate, and those who agreed and completed their questionnaires invited their patients. Each patient and dentist was assigned a unique number on-site for statistical analysis, ensuring complete anonymity. Notably, these numbers were never associated with any identifiable information. This approach ensured that personal data were not processed in the study.

3.1.2. The questionnaires

3.1.2.1. The patient questionnaire[2]

Initially, we developed the patient questionnaire comprising 31 items. Among these, six items (Nos. 1 to 5 and 16) 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 (10, 22, 24, 50, 52, 86). 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." For instance, item No. 12 ("I am very committed to continuing a relationship with my physician") from Wang et al. (10) was modified to read, "I am very committed to continuing a relationship with my dentist" in our questionnaire.

In terms of measuring satisfaction, we embraced Reichheld's perspective, who asserted that the most crucial gauge of customer satisfaction lies in whether the customer would recommend a product or service to others (87). Concerning loyalty, we adopted Oliver's definition,

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[2] Both questionnaires are attached as part of the Appendix.

characterizing it as "a deeply held commitment to consistently repurchase or revisit a preferred product or service in the future, despite potential situational influences and marketing efforts that could prompt switching behavior" (88). Two specific items were dedicated to satisfaction ("I would recommend my dentist to others") and loyalty ("I am very committed to continuing a relationship with my dentist"). Due to their clear phrasing and alignment with the concepts defined in our study, we considered these items particularly suitable for evaluating satisfaction and loyalty.

3.1.2.2. The dentist questionnaire

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. These 15 pairs were meticulously chosen as they covered vital aspects and could be meaningfully rephrased from the dentist's perspective. This strategic selection allowed us to assess the alignment between the dentist's opinion and the patient's experience. In this approach, the dentists were queried about their viewpoints on specific issues, mirroring what their patients were asked regarding their last dental visit. Our methodology in this regard was influenced by the study conducted by Riley and colleagues (29). A representative example of such a matched pair includes item No. 18 in the patient questionnaire ("The dentist was interested when I spoke about my symptoms.") and item No. 9 in the dentist questionnaire ("It matters to the patients that their dentist shows interest when they speak about their symptoms."). The primary objective of the dentist questionnaire was to facilitate a direct comparison with the patients' perspectives. Consequently, the dentist questionnaire comprised fewer items than the patient questionnaire. In the patient questionnaire, we explored a broader array of factors that could potentially impact satisfaction and loyalty.

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.

All items in both questionnaires were presented as 5-grade Likert-type statements, except for the demographic items and one binary item. The binary item required patients to indicate whether they had visited their dentist more or less than 10 times by the time of the study (item No. 16).

3.1.3. Pre-testing and psychometric characteristics

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. It is important to emphasize that both the dentists and patients involved in the pilot sample were excluded from the final study sample.

To assess the factor structure of both questionnaires, an exploratory factor analysis (EFA) with principal component analysis was employed, utilizing varimax rotation to determine item loadings within factors. The determination of the number of factors to retain in the final model was based on the Kaiser factor retention method, eigenvalues above 1, and a screen test. Item factor loadings were carefully examined, and items with loadings above 0.50 were included in the analysis. As anticipated, given the item selection process, both questionnaires exhibited a clear two-factor structure. One factor related to the patient's overall experience and personal rapport with the dentist, while the other encompassed communicative aspects such as language usage. The study's dependent variables were aligned with the first factor. The Cronbach's alpha values were calculated at 0.75 for the patient questionnaire and 0.79 for the dentist questionnaire, indicating satisfactory internal consistency.

Upon completion of the study sample dataset, a reassessment of the questionnaires' psychometric properties was carried out. Both questionnaires retained the same two underlying factors observed in the pilot phase. In the final analysis, the patient questionnaire (N=1121) exhibited the following characteristics: Bartlett's test for sphericity was significant (χ^2 =10544, df =300, p< 0.01), the Kaiser-Meyer-Olkin (KMO) test for sampling adequacy yielded an overall value of 0.904 (0.720-0.944), and Cronbach's alpha was calculated at 0.84, indicating excellent internal consistency.

Similarly, the analysis of the dentist questionnaire (N=77) revealed significant results for Bartlett's test (χ^2 =290, df =120, p< 0.01), an overall KMO value of 0.608 (0.464-0.805), and a Cronbach's alpha of 0.71, indicating satisfactory internal consistency. The slightly lower values for the dentist questionnaire were expected, given its supportive role as a descriptive complement to the patient questionnaire, rather than being designed as a standalone instrument.

The questionnaires were administered in Hungarian. To ensure their applicability to Hungarian patients and practitioners, the questionnaires were translated following accepted international standards (89).

3.1.4. Statistical analysis

3.1.4.1. 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.

3.1.4.2. 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.

3.1.5. Ethical considerations and consent to participate

This study was conducted in conformity with the Helsinki Declaration and was approved by the Hungarian Medical Research Council's Scientific and Research Ethical Committee (Approval number: IV/4834-2/2020/EKU).

3.2. Communication, decision making and "the compromise effect"

3.2.1. Participants, study procedures and data processing

A total of 676 volunteers took part in the study. All participants were patients at the Faculty of Dentistry, University of Szeged, Hungary. The number of participants was determined as the maximal number of volunteers available in a one-year timeframe. Participation in the study was voluntary and contingent upon informed consent.

3.2.2. The questionnaire

An anonymous questionnaire, designed by our research team, 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 (27, 91-95). 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. For an overview of the questionnaire's structure, refer to Table 1.

Table 1. The variables as they appeared in the different versions of the questionnaire. In all versions of the questionnaire, all treatment types were given, but with differing available options (x,y,z; x,y; y,z; x,z) and with or without the additional information. Uppercase letters indicate the category of the additional information as follows: a- technical term; b- durability; c- the possibility of keeping teeth intact; d- modernity; e- esthetics. The numbers 1 to 4 indicate

the versions of the questionnaire Prices are shown in EUR for international comparability (the questionnaires contained this information in Hungarian Forints). The EUR to HUF conversion rate was 1 to 308.

Treatment	Price	Additional information	1	2	3	4
root canal	20 EUR	single-point[a]	x	x		x
	40 EUR	lateralcondensational	x	x	x	
	60 EUR	thermafil	x		x	x
caries with no inflammation	30 EUR	filling (2-4 years' lifespan)[b]	x	x		x
	60 EUR	composite inlay (6-8 years' lifespan)	x	x	x	
	90 EUR	ceramic inlay (10-12 years' lifespan)	x		x	x
treatment of inflamed tooth	40 EUR	keep one's tooth with filling[c]	x	x		x
	80 EUR	crown preparation	x	x	x	
	120 EUR	bridge preparation	x		x	x
crown	85 EUR	traditional[d]	x	x		x
	170 EUR	modern	x	x	x	
	255 EUR	innovative	x		x	x
dentures	104 EUR	well visible clips[e]	x	x		x
	208 EUR	slightly visible clips	x	x	x	
	312 EUR	invisible clips	x		x	x

3.2.3. Statistical analysis

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.

3.2.4. Ethical considerations and consent to participate

The study protocol conformed to the Helsinki Declaration and was approved by the by the Human Ethics Review Board of the University of Szeged (Approval number: 39/2011)

3.3. Implementing student-centered career counseling into a teacher-centered dental curriculum

Our course was designed with multifaceted objectives. These objectives were formulated based on Donald Super's career development theory, providing a structured framework (96, 97). 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 objectives associated with these phases encompass career planning, specialized training, and the initiation of a career. Technically speaking, fifth-year dental students (aged 22–23 years) fall within the implementation substage. However, Super's linear model of career

development, built upon consecutive stages, assumes active support for the completion of each stage, which does not always align with the complex realities students face.

Hur and colleagues demonstrated the varying readiness levels of medical students for their careers, highlighting the nuanced nature of students' preparedness (98). We encountered similar situations, prompting our decision to expand the scope of our objectives to encompass the entire exploration stage, including the crystallization substage (15 to 17 years as per the original model). The rationale for including this early substage was rooted in the diverse career paths dentistry offers, beyond the conventional chairside work mentioned earlier. We presumed that our students lacked this crucial information during their initial crystallization stage in high school. By revisiting this substage armed with newfound insights, students could engage in essential self-assessment of their needs, values, competencies, and opportunities. This self-reflection is pivotal, as it lays the foundation for making well-informed career decisions.

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 (99). Second, activities related to the secondary objective complement and enhance the attainment of our primary goal.

3.3.1. Course Design

The course is structured into three consecutive phases, each designed to target specific substages within Super's exploration stage, as previously outlined. Table 2 illustrates the phases and corresponding tasks related to these substages.

Table 2. Legend- TP/C: theoretical preparation/contemplation; PP: practical preparation; TO: task to be completed outside the class IP: implementation practice; CR: crystallization; SP: specification; IMP: implementation (Career development substages from Super's model, see 3.3).

Addressed career development substage	Topic/Activity	Study goal	Allocated time	Course phase
CR	Opportunities as a fresh graduate	the student knows about his or her opportunities as a fresh graduate (including dental work)	1 hour	TP/C
CR	Career options as a dentist	the student knows about his or her opportunities specifically linked to the dental degree	1 hours	TP/C
CR	Assessment of personal character traits, strengths and weaknesses	the student has a fundamental career-related concept of himself or herself as a person	2 hours	TP/C
IMP	Study sample CVs to demonstrate main points of CV writing	the student knows the formal and stylistic requirements of a professionally written CV	2 hours	TP/C
SP	Coaching in career planning (optional, by appointment)	The student has personalized feedback on his or her actual career dilemmas	1 hour/student	TP/C
IMP	Preparation of own CVs (extra-class)	the student has a formally and content-wise correct CV	NA	PP
IMP	Motivation letter and professional portfolio samples	the student knows what (not) to include in a motivation letter and portfolio	1 hour	PP
IMP	Preparation of own motivation letter (extra-class)	the student has a motivation letter	NA	PP
IMP	Evaluation of CVs in group, suggestions, corrections	the student can critically analyze a CV and use this knowledge to enhance his or her own CV	1 hour	PP
IMP	Evaluation of motivation letter in group, suggestions, corrections	the student can critically analyze motivation letter and use this knowledge to enhance his or her own motivation letter	1 hour	PP
CR/SP	Making career decisions	the student can identify short- and long-term goals (vs. consequences) and think consciously about a career decision	1 hour	PP
SP	Establishment of short- and long- term goals	the student can set well-defined career goals and expectations for himself or herself	2 hours	PP
IMP	Simulated interview (individual)	the student has prepared for a job interview-like situation and tried what it feels like to be interviewed for a job	4 hours	IP
SP	Assessment of possible workplaces/jobs	the student knows how to gather information about a potential workplace/position and how to assess that information	1 hour	IP
IMP	Job fair	The student meets real employers, has a chance to apply for jobs	4 hours	IP

The course is conducted by a team comprising two instructors: a seasoned dental educator (who also practices dentistry) and a specialist in health and marketing communication. Student assessment is based on active participation, classroom engagement, and the quality of the

materials prepared. The grading system employs a scale of five points, where 1 signifies failure and 5 signifies excellence. The course accommodates a maximum of 15 students per semester for each language option (English and Hungarian, as indicated below). Importantly, although the course is optional, it carries academic credit; successful completion of the course contributes toward the fulfillment of dental studies requirements. The various components of the course and their contributions to the course objectives are summarized in Figure 1.
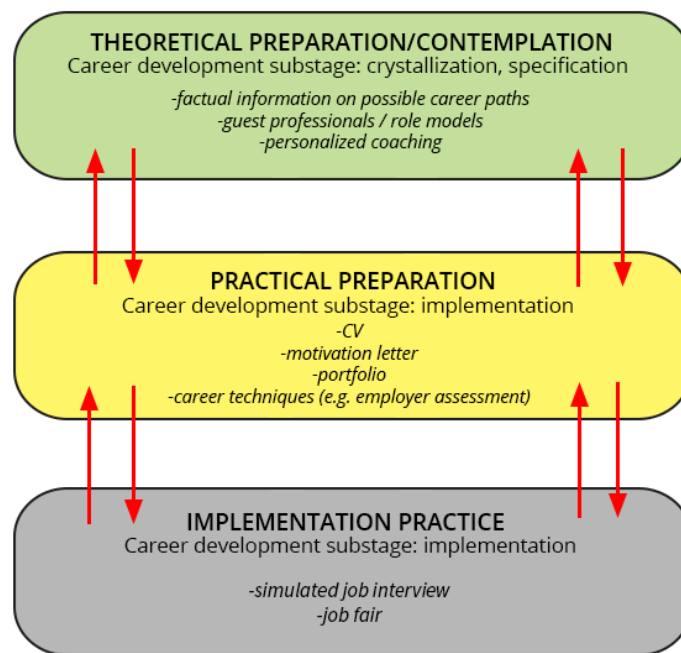

Figure 1. Components of the course and their interaction. The theoretical preparation/contemplation phase supports the crystallization and specification substages. By offering factual information, showing models and reflecting on the student as a professional who is about to enter the job market, the phase aims at helping students find a job they can identify with. The practical preparation and implementation practice phases both support the implementation substage. The motivation letter and CV have dual purpose: they help the student identify the path he or she wishes to take, but later these can also be used for actual job applications. The mock job interview (with feedback) help students reflect on their self-promotion skills in an interview situation and offers starting points for enhancement if necessary. The portfolio is a material means of self-promotion that the students can use for job application, just like the CV and motivation letter prepared in the course. The arrows indicate that the phases can influence each other in both ways.

3.3.1.1. The theoretical preparatory phase

The initial phase comprises introductory lectures that explore various career options and opportunities for newly graduated dentists. These lectures offer in-depth insights into specialization paths and the distinctions between working as a private practitioner, a state

employee, or a combination of both. Special emphasis is placed on the essential personal attitudes, skills, and abilities necessary for students to find their niche within the discussed settings. Although the primary focus is on acquainting students with local (Hungarian) aspects, the lectures also provide an overview of key distinctions between EU member states and select overseas countries, such as the United States and Australia. Despite their targeted subject matter, these lectures are interactive and adaptable in multiple ways. First, students actively engage in discussions, enabling them to ask questions at any point or even guide the direction of the lecture within the defined topic boundaries. Second, students are encouraged to request specific information about particular settings or countries of interest, which the lecturer incorporates into subsequent lectures. This flexibility allows each student group to tailor the lectures according to their unique requirements and interests. Third, dental professionals are frequently invited as guest speakers, either in person or online, providing participants with firsthand experiences and insights. The overarching objective of this theoretical preparatory phase is to facilitate "re-crystallization," assisting students in forming realistic career expectations by offering comprehensive information and presenting suitable role models.

3.3.1.2. The phase of practical preparation

The second phase, practical preparation, focuses on CV and motivation letter writing as key skills necessary for a successful job application. The characteristics of the genres are explained, and samples are provided. As part of an extracurricular assignment, students are tasked with creating their own CVs and motivation letters. The instructor actively participates in this writing process, offering constructive feedback on draft versions and suggesting revisions as necessary. It is crucial to note that the primary objective of this phase isn't merely to instruct students on these writing forms but to provide an opportunity for self-reflection. By engaging in this exercise, students are encouraged to contemplate their character, aspirations, strengths, and weaknesses. The resulting "inventory" not only aids individuals in considering what to convey during their initial job applications but also serves as a valuable tool for identifying an optimal starting point for their careers. Given that the course is designed for students in their final year, the CVs and motivation letters prepared here are directly applicable for immediate use.

3.3.1.3. The crystallization phase

In the third phase, students refine their CVs and motivation letters, engaging in individual mock job interviews that are recorded on video. Subsequently, both students and teachers

collaboratively assess these recorded interviews. The choice of interview simulation is deliberate, as interviews stand out as the most frequently employed and heavily weighted method for employee selection. Research indicates that coaching and feedback can significantly enhance interview performance (100-102).

Simultaneously, during this phase, the course culminates in a job fair, a real-life, semi-formal interaction between course participants and various local employers. Employers are extended invitations to participate if they are interested in hiring newly graduated dentists. Typically held at the end of the semester in a popular local venue, this event allows personal interactions between students and employer representatives within a neutral setting. Employers are provided with the CVs and motivation letters of the students in advance, enabling them to engage with those individuals whose profiles align with their interests. The session operates without strict regulations, allowing students the freedom to initiate conversations with employers of their choice. This event spans 3 to 5 hours and can be best described as a social gathering with a well-defined purpose.

3.3.1.4. Counseling

An optional, individual, sixty-minute coaching session is also part of the course. This is done by appointment. Although this session is optional, no student has missed this opportunity so far.

3.3.2. Participants

For this pilot study, we have reviewed two completed semesters and 39 students who have finished the course (12 men and 27 women). The mean age of the participants was 24.6 ($\pm$2.3) years. All students were in their fifth (final) year at the Faculty of Dentistry, University of Szeged. As the Faculty offers dental education in two languages (Hungarian and English), this course was also held in these two languages. Of the 39 students, 28 attended the Hungarian course (mean age: 23.9 $\pm$1.3 years) and 11 attended the English course (mean age: 26.4$\pm$3.2 years). Participants of the English course came from 7 different countries (both EU and non-EU countries).

3.3.3. Student feedback

Our primary emphasis was on gathering student feedback about the course, a vital indicator of its effectiveness and alignment with the curriculum. When students perceive a course as

valuable, engaging, and well-structured, it enhances the course's effectiveness in knowledge transfer.

A brief anonymous questionnaire evaluating the course and its methodology was administered to all participants to gauge their feedback. Ethical approval for the questionnaire was obtained from the Institutional Review Board at the University of Szeged. The questionnaire comprised 20 items, with the first two items focusing on demographics (gender and age). The remaining items consisted of statements that students were required to assess using a 5-point Likert scale (ranging from 1 - strongly disagree, 2 - disagree, 3 - neither agree nor disagree, 4 - agree, to 5 - strongly agree). Two of the 18 statements served as negative controls to validate responses. The statements were designed to evaluate five key aspects: overall impression, course satisfaction (2 items); personal development (4 items); CV/motivation letter/portfolio (5 items); career development techniques (e.g., assessment of potential employers, 4 items); and the job fair (3 items). Each statement was characterized by a mean score, accompanied by its standard deviation.

3.3.4. Statistical analysis

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).

3.3.5. Ethical considerations and consent to participate

The study protocol conformed to the Helsinki Declaration and was approved by the Human Ethics Review Board of the University of Szeged (approval No. 41/2018).

4. RESULTS

4.1. Patient satisfaction and loyalty

4.1.1. The study population

A total of 77 dentists and 1,121 patients participated in the survey. Among the dentists, 44 were male (51.9%) and 33 were female (48.1%), with an average age of 40.57 years (± 15.23, ranging from 23 to 72 years). At the time of the study, they had, on average, 17.60 years of experience in the profession (± 12.16 years). The majority of their practices were located in county seats (48 dentists, 62.3%), followed by other towns (19 dentists, 24.7%), and 10 practices were situated in the capital (13.0%).

Regarding the patients, 444 were male (39.6%) and 677 were female (60.4%). Their average age was 43.60 years (± 13.97, ranging from 18 to 90 years). Most of the patients resided in either a county seat (394 patients, 35.1%) or a town (425 patients, 37.9%). The remaining patients were distributed among the capital (147 patients, 13.1%), townships (12 patients, 1.1%), and villages (143 patients, 12.8%). A majority of the patients held a high school diploma (559 patients, 49.9%) or a university degree (509 patients, 45.4%). Twenty-two patients (2.0%) possessed a postgraduate degree, while for 31 patients (2.8%), completing elementary studies was their highest level of education.

Regarding dental visits, 651 patients (58.1%) had seen their dentist fewer than 10 times before the study, while the remaining 470 patients had attended more than 10 visits. The mean age difference between dentists and their patients was 0.71 years (± 15.71), with a 95% confidence interval (CI) of -0.20 to 1.61 years (negative values indicated cases where the patient was younger). The location of the dental practice matched the patient's residence in 706 cases (63.0%). Gender concordance between patients and dentists was observed in 598 cases (53.3%).

4.1.2. "I would recommend my dentist to others" – satisfaction

The mean score for this statement among the patients was 4.92 (± 0.31) with a 95% CI of 4.91-4.94. In contrast, among the dentists, the corresponding statement received a slightly lower score of 4.53 (± 0.55) with a 95% CI of 4.41-4.66.

Results from the linear regression analysis revealed the significant impact of the independent variables within the regression model on the overall variance of patients' responses ($F_{(32,1088)}$ = 27.59, $p < 0.001$, R^2 = 0.43). Seven variables (questionnaire items) were identified as

significant predictors of the score assigned to this statement. These variables included the match between the practice and the patient's residence (β= -0.060, $p < 0.05$); the dentist's expression of interest in the patient's symptoms (β= 0.217, $p < 0.001$); the patient's satisfaction with the appointment frequency (β= 0.088, $p < 0.01$); the patient's contentment with the quality of treatment (β= 0.146, $p < 0.001$); the patient's trust in the dentist's decisions about treatment (β= 0.270, $p < 0.001$); the patient's perception that the dentist knew them (β= 0.079, $p < 0.05$); and the patient's feeling that the dentist was familiar with their medical records (β= 0.085, $p < 0.01$). For four of these variables, a comparison between the patient's experience and the dentist's opinion on the specific aspect of the patient-dentist relationship was feasible. The mean scores comparison is detailed in Table 3.

Table 3. Comparison of the responses of the dentists and the patients. D: dentist questionnaire, P: patient questionnaire; the numbers next to the letters indicate the number of the item in the given questionnaire.

Item pair		Topic	Dentist mean ($\pm$SD)	Patient mean ($\pm$SD)
D5	P8	The patient trusts the dentist's medical decisions according to the dentist/patient	4.08 ($\pm$0.68)	4.91 ($\pm$0.33)
D9	P18	The dentist should show/ showed interest in the patient's symptoms	4.94 ($\pm$0.25)	4.90 ($\pm$0.38)
D15	P26	Frequency of appointments important to patient/satisfactory according to patient	3.81 ($\pm$0.90)	4.81 ($\pm$0.50)
D16	P27	The quality of treatment is important to the patient/satisfactory according to patient	4.70 ($\pm$0.59)	4.94 ($\pm$0.27)

4.1.3. "I am very committed to continuing a relationship with my dentist"- loyalty

The mean score for this statement among the patients was 4.78 ($\pm$ 0.71) with a 95% CI of 4.74-4.82. In comparison, among the dentists, the corresponding statement received a slightly lower score of 4.45 ($\pm$ 0.62) with a 95% CI of 4.31-4.59.

Results from the linear regression analysis highlighted the significant influence of the independent variables within the regression model on the overall variance of patients' responses ($F_{(32,1088)}$ = 7.67, $p < 0.001$, R^2 = 0.16). Six variables (questionnaire items) emerged as significant predictors of the score assigned to this statement. These variables included the dentist's use of clear language when explaining the treatment (β= 0.126, $p < 0.01$); the dentist's

provision of explanations about the procedure before initiating treatment (β= -0.101, p < 0.01); the patient's satisfaction with the appointment frequency (β= 0.125, p < 0.01); the dentist offering multiple treatment plans (β= 0.085, p < 0.05); the patient's subjective perception that the staff at their current dental care provider cared about them (β= 0.098, p < 0.01); and the patient's trust in the dentist's decisions about their treatment (β= 0.091, p < 0.01). For five of these variables, a comparison between the patient's experience and the dentist's opinion on the specific aspect of the patient-dentist relationship was possible. The mean score comparison is detailed in Table 4.

Table 4. Comparison of the responses of the dentists and the patients. D: dentist questionnaire, P: patient questionnaire; the numbers next to the letters indicate the number of the item in the given questionnaire.

Item pair		Topic	Dentist mean (±SD)	Patient mean (±SD)
D5	P8	The patient trusts the dentist's medical decisions according to the dentist/patient	4.08 (±0.68)	4.91 (±0.33)
D12	P23	The dentist should use/used clear language when talking about the treatment	4.88 (±0.32)	4.83 (±0.46)
D13	P24	The dentist should explain/explained the procedure before starting	4.66 (±0.50)	4.90 (±0.34)
D15	P26	The frequency of appointments important to the patient/satisfactory according to the patient	3.81 (±0.90)	4.81 (±0.50)
D17	P29	The dentist should offer/offered alternative treatment plan(s)	4.44 (±0.87)	4.57 (±0.80)

4.1.4. Agreement/disagreement between the dentists' and their patients' responses

The statements with the highest and lowest scores in both groups are summarized in Table 5. For the patient group, the 25th percentile limit was 4.42, and the 75th percentile limit was 4.9. In the dentist group, the 25th percentile limit was 4.05, and the 75th percentile limit was 4.77.

Table 5. The highest- and lowest-scoring statements about patient experience according to the patients and their dentists. A higher score indicates a higher level of agreement with the statement. The statements are arranged in descending order by their mean score.

Item No.	Item	Mean score	
PATIENTS			
27	I am satisfied with the quality of the treatment.	4.94	
11	I would recommend my dentist to others.	4.92	
8	I trust this dentist's judgments about my medical care.	4.91	
20	The dentist explained clearly what the problem was.	4.91	75th percentile
28	I am satisfied with the explanation given by the dentist.	4.91	
18	The dentist was interested when I spoke about my symptoms.	4.90	
24	The dentist told me what s/he was going to do before starting the procedure.	4.90	
7	I have developed a personal relationship with my current dentist	4.27	
9	I'm confident that my dentist knows me.	4.22	
14	I possess good knowledge of health care services.	4.00	25th percentile
19	The dentist was interested in the effects of the problem on my family or private life.	3.91	
13	For me, the costs in time / money / effort to switch dentists are high.	3.59	
15	I am quite experienced in the health care area.	3.47	
DENTISTS			
9	It matters to the patients that their dentist shows interest when they speak about their symptoms.	4.94	
12	It matters to the patients that their dentist uses words that are understandable in talking about their dental care.	4.88	75th percentile
10	It matters to the patients that their dentist explains clearly what the problem is.	4.87	
18	It matters to the patients that their dentist discusses the treatment plan with them.	4.77	
12	It matters to the patients that the dentist encourages them to ask questions about their treatment.	4.05	
13	The duration of an appointment matters to the patients.	4.05	25th percentile
14	The frequency of appointments matters to the patients.	3.81	
15	Most of the patients possess good knowledge of health care services.	3.48	

The results concerning the level of disagreement are summarized in Table 6. The data in the table have been organized based on the percentages of complete agreement, indicating instances where the dentist and the patient attributed the same level of importance to a particular issue or found a statement to be true to the same degree. This arrangement was chosen for its ease of interpretation and its reflection of the overall alignment of opinions.

The highest rates of full agreement (over 80%) were observed for the pairs D9-P26 (The dentist should show/ showed interest in the patient's symptoms) and D10-P28 (The dentist should explain/ explained the problem with the teeth in an understandable way). In contrast, the rates of full agreement were notably low (below 30%) for three item pairs: D5-P8 (The patient trusts the dentist's medical decisions according to the dentist/patient), D8-P14 (The patient is informed about healthcare according to the dentist/patient), and D15-P34 (The frequency of visits is important to the patient/satisfactory according to the patient). Relatively high levels of complete disagreement were observed for two item pairs: D7-P12 (The patient is strongly committed according to the dentist/patient) and D17-P37 (The dentist should offer/offered alternative treatment plan(s)).

The table demonstrates that although the percentages of full agreement varied, the responses of both patients and dentists were relatively close. The average level of disagreement was consistently below 1 point, except for the pair D15-P34 (The frequency of visits is important to the patient/satisfactory according to the patient), with an average disagreement of 1.03 points. Additionally, most of the mean disagreement scores are positive, indicating that patients were somewhat more content with the given aspect of their patient experience than their dentist deemed it important. Two exceptions to this trend are D9-P26 (The dentist should show/ showed interest in the patient's symptoms) and D12-P31 (The duration of visits is important to the patient/satisfactory according to the patient), but the disagreement in these cases is marginal.

Table 6. Agreement/disagreement between the dentists' and their patients' responses to all matched item pairs arranged in ascending order of full agreement. Results from 1121 matched responses. The numbering of the items follows the convention of Tables 3 and 4. FA: full agreement, FD: full disagreement, DD: degree of disagreement. For the calculation of degree of disagreement, see the statistical analysis section.

Item pair		Topic	FA N (%)	FD N (%)	DD (mean)	SD	95% CI lower limit	95% CI upper limit
D5	P8	The patient trusts the dentist's medical decisions according to the dentist/patient	291 (25.9%)	0 (0%)	0.90	0.80	0.85	0.95
D8	P14	The patient is informed about healthcare according to the dentist/patient	300 (26.7%)	4 (0.4%)	0.48	1.23	0.41	0.55
D15	P34	The frequency of visits is important to the patient/satisfactory according to the patient	305 (27.2%)	0 (0%)	1.03	1.02	0.97	1.09
D14	P33	The duration of visits is important to the patient/satisfactory according to the patient	398 (35.5%)	0 (0%)	0.86	0.86	0.80	0.92
D11	P30	The dentist should encourage/ encouraged questions about treatment	407 (36.3%)	0 (0%)	0.59	0.57	0.53	0.66
D6	P11	The patient would recommend the dentist to others according to the dentist/patient	570 (50.8%)	0 (0%)	0.41	0.64	0.37	0.44
D7	P12	The patient is strongly committed according to the dentist/patient	582 (51.9%)	14 (1.2%)	0.24	0.96	0.18	0.29
D17	P37	The dentist should offer/offered alternative treatment plan(s)	590 (52.6%)	17 (1.5%)	0.04	1.11	-0.02	0.11
D19	P39	The dentist and the patient should agree/agreed on the treatment plan	722 (64.3%)	2 (0.2%)	0.23	0.66	0.19	0.27
D13	P32	The dentist should explain/explained the procedure before starting	728 (64.9%)	0 (0%)	0.26	0.55	0.23	0.30
D16	P35	The quality of treatment is important to the patient/satisfactory according to the patient	770 (68.6%)	0 (0%)	0.31	0.77	0.27	0.36
D18	P38	The dentist should discuss/discussed treatment plan with the patient	824 (73.4%)	0 (0%)	0.14	0.59	0.11	0.17
D12	P31	The dentist should use/used clear language when talking about the treatment	863 (76.9%)	0 (0%)	-0.06	0.57	-0.09	-0.02
D10	P28	The dentist should explain/ explained the problem with the teeth in an intelligible way	935 (83.3%)	1 (0.1%)	0.03	0.47	0.00	0.05
D9	P26	The dentist should show/ showed interest in the patient's symptoms	958 (85.4%)	1 (0.1%)	-0.03	0.47	-0.05	0.00

4.2. Decision making and the compromise effect

In the one-year timeframe altogether 385 female and 291 male participants completed the questionnaire. Demographic characteristics are given in Table 7.

Table 7. The demographic characteristics of the participants (N=676). A non-representative sample was collected in which males were under-represented by 3.5 percentage points as compared to the entire population of Hungary, while those with a degree of higher education were over-represented by 2 percentage points. As for the highest level of education, the sample was dominated by participants who had a certificate of secondary education (65.6%).

Sex	Frequency (N)	Rate (%)
Male	385	56.9
Female	291	43.1
Age	**Frequency (N)**	**Rate (%)**
18-20 yrs	178	26.57
21-30 yrs	239	35.67
31-40 yrs	103	15.37
41-50 yrs	100	14.93
50+ yrs	50	7.46
Education	**Frequency (N)**	**Rate (%)**
Elementary	78	11.5
Secondary	444	65.6
Higher	145	21.1

The results are summarized in Table 8. For the exact treatments and additional information see also Table 1. Percentages indicate the ratio of respondents opting for the given item throughout this section.

Table 8. The frequency of choosing the medium-priced (middle) option with only price information and with additional information in three different price combinations. The ordinals indicate the price categories in an increasing order. PO - price only, AI- with additional information; x- low price, y- medium price z- high price; INFO: TT- technical term, LS- expectable life span, OT- the possibility of keeping one's own teeth with filling, MO- information on how modern the given method is, ES- information on esthetics (see also Table 2). Please note that this table contains data only on the medium-priced options. Data on the rest of the options are given in the text.

	PO	AI	PO	AI	PO	AI
Price (EUR)/INFO	(x,y,z)		(x,y)		(y,z)	
1st 20-40-60 / TT	37.3%	47.0%	46.2%	48.1%	60.8%	57.8%
2nd 30-60-90 / LS	27.5%	45.0%	21.8%	46.8%	47.9%	62.7%
3rd 40-80-120 / OT	36.3%	40.0%	25.6%	42.9%	57.4%	68.7%
4th 85-170-255 / MO	43.1%	55.0%	29.9%	48.1%	54.3%	71.7%
5th 104-208-312 / ES	45.1%	28.0%	42.3%	72.7%	36.2%	41.0%

4.2.1. Results according to price category

In the category of the lowest price range and under the $[x,y,z]_{PO}$ arrangement (N=100), [x] emerged as the preferred choice (42%), followed by [y] with 37%, and [z] with only 21%. When AI was introduced (N=100), [x] remained the dominant choice at 42%. Meanwhile, [z] decreased significantly to 11%, and [y] gained a substantial 10 percentage points, reaching 47%. When limited to two options, the introduction of AI had minimal impact: in the $[x,y]_{PO}$ scenario, [x] remained the predominant choice at 54%, only slightly decreasing to 51% with AI. In the $[y,z]_{PO}$ arrangement, [y] held the lead with 61%, which decreased marginally to 58% with AI. In the $[x,z]_{PO}$ configuration (N=92), [x] held a strong majority at 64%, dropping to 53% in the AI setting (N=70). Preference for [y] was observed exclusively in the $[x,y,z]_{AI}$ arrangement. However, even in this scenario, the chi-square test did not reveal a significant association between the choices and the availability of information in any of the test versions.

In the price category one level higher, the distribution for $[x,y,z]_{PO}$ was as follows: [x]: 53%, [y]: 27%, [z]: 20%. With the introduction of AI, the pattern shifted: [x]: 33%, [y]: 45%, [z]: 22%. The chi-square test highlighted a significant association between the choices and the availability of information (χ^2= 9.25, 2, p< 0.05). When considering only two options, a similar trend was observed. In the $[x,y]_{PO}$ configuration: [x]: 79%, [y]: 21%, and with AI, the percentages changed to [x]: 53%, [y]: 47%. Fisher's exact test indicated a significant association with the availability of information (p< 0.01). In the $[y,z]_{PO}$ arrangement, the proportions were as follows: with AI, [y]: 63%, [z]: 37%. Fisher's exact test indicated a significant association with the availability of information (p< 0.05). Finally, in the $[x,z]_{PO}$ arrangement, [x] (66%) was favored over [z] (34%). In the $[x,z]_{AI}$ setup, the results were: [x]: 51%, [z]: 49%. Here, no significant association was found. Remarkably, in this price category, the additional information seemed to guide respondents' choices toward the middle option in all cases.

In the third price category, the $[x,y,z]_{PO}$ arrangement yielded the following outcomes: [x]: 52%, [y]: 36%, [z]: 12%. The results remained consistent in the $[x,y,z]_{AI}$ setup: [x]: 50%, [y]: 40%, [z]: 10%. When considering only two options, the $[x,y]_{PO}$ configuration demonstrated a preference for [x] (75%) over [y] (25%). With AI, the choices were more evenly distributed: [x]: 57%, [y]: 43%. Notably, in this price category, a significant association with the availability of information was found (p< 0.05, Fisher's exact test). In the $[y,z]_{PO}$ arrangement, [y] was favored (58%) over [z] (42%). This preference for [y] became even more pronounced (69%) in

the [y,z]$_{AI}$ arrangement. Lastly, in the [x,z] comparison, both in the PO and AI setups, [x] emerged as the preferred choice (72% and 64%, respectively).

In the fourth price category, the compromise effect was evident in the [x,y,z]$_{PO}$ arrangement: [x]: 32%, [y]: 43%, [z]: 25%. With AI, the same trend was found: [x]: 34%, [y]: 55%, [z]: 11%. The association with the availability of additional information was significant ($\chi2= 7.12$, df= 2, $p< 0.05$). In the [x,y]$_{PO}$ configuration, [x] was the most frequent choice (70%). AI shifted the balance towards [y] (52%, $p< 0.05$, Fisher's exact test). Concerning [y,z]$_{PO}$, [y] was slightly more favored (51%). However, with AI, the dynamics changed significantly: [y]: 71%, [z]: 29% ($p< 0.05$, Fisher's exact test). The [x,z] pairing exhibited a similar trend: [x] was preferred both with and without AI (71% and 57%, respectively). In this case, the association was not significant.

In the highest price category, a marked difference was observed compared to the other categories. In the [x,y,z]$_{PO}$ arrangement, the results were as follows: [x]: 15%, [y]: 45%, [z]: 40%. Interestingly, even though the prices were high in this category, the low-priced option was chosen by only 15%. Even more intriguingly, with AI, both [x] and [y] were chosen less frequently (by 4% and 17%, respectively), while [z] was chosen more frequently (61%). The association with the availability of information was significant ($\chi^2= 8.94$, df= 2, $p< 0.05$). Similar trends were observed in the [x,y] and [y,z] arrangements. Without AI, [x] was chosen by 54% and [y] by 46% in the [x,y] arrangement. In the [y,z] arrangement: [y]: 61%, [z]: 39%. In both cases, the cheaper option was chosen more frequently. However, with AI, a shift was observed toward the more expensive option (27% vs. 73% [x] vs. [y]; 59% vs. 41% [z] vs. [y]). The association with the availability of additional information was significant only in the former case ($p< 0.001$, Fisher's exact test). Finally, in the [x,z]$_{PO}$ arrangement, [x] was slightly dominant (55%), but [x,z]$_{AI}$ showed a different pattern: [x] was chosen by only 34%, making [z] the dominant choice (66%). The association was significant ($p< 0.05$, Fisher's exact test).

4.3. The student-centered career counseling course

The results are shown in Table 9 and Figure 2. As for the item-wise results (Table 9), most statements received a mean score above 4 (agree or strongly agree), which indicates a high level of general satisfaction with the course. These results confirmed our main hypothesis. Standard deviations were low with two notable exceptions, item #10 (4.03± 1.197) and item # 16 (3.77 ± 1.459). These items ask the respondent about the perceived effect of feedback on

the simulated interview and if he/she has found a potential employer during the job fair, respectively.

Negative statements #3 and #9 received a mean score below 2, indicating that participants did not find having to think and talk about their own personality excessively uncomfortable, and they did not consider knowledge about how to assess a potential employer useless (the latter was control question for item #6). The results, therefore, did not confirm our hypothesis regarding the personal/psychological aspect, but standard deviation of the mean of item #3 (1.77) was almost 1.0, which is the third highest standard deviation. Results of the aspect-wise analysis are shown in Figure 2.

Table 9. Student feedback on the course. Groups of questions: CV/P/M: CV, portfolio, motivation letter; PERS: personality and self-knowledge; TECH: career-related techniques; JF: Job fair; GEN: general impressions. *: negative control question

STATEMENT	Mean	+/- SD	Group
1. Guidance on how to create a professionally written CV will help me get the job I want.	4.85	.366	CV/P/M
2. The assessment of my personal character traits, strengths and weaknesses helped me to clarify what career fits me best.	4.13	.767	PERS
3. I found it uncomfortable or embarrassing to explore my personal characteristics, strengths and weaknesses.	1.77	.959	PERS*
4. Learning about what jobs I can have and what they mean in terms of career made me more confident about looking for a job.	4.46	.600	TECH
5. Individualized career advice received in this course did help me plan my career.	4.62	.747	TECH
6. Guidance on how to assess a potential employer/position helped me create short and long-term goals.	4.41	.751	TECH
7. Studying sample CVs helped me create a CV that accurately reflects the skills I can bring to a job.	4.64	.668	CV/P/M
8. The evaluation of a professionally made portfolio sample gave me a clear idea of how to develop my own professional portfolio.	4.49	.601	CV/P/M
9. Guidance on how to assess a potential employer/position did not me create short and long-term goals.	1.31	.569	TECH*
10. The feedback I received following the simulated interview allowed me to identify areas that need improvement before an actual interview.	4.03	1.197	PERS
11. The interaction, suggestions and feedback received during the group discussion helped me improve my own CV.	4.49	.644	PERS
12. The feedback I received on my motivation letter gave me clear guidance on how to improve it.	4.62	.544	CV/P/M
13. The feedback I received on the materials I created in this course made me more confident about applying for an actual job.	4.69	.521	CV/P/M
14. I think that the Job Fair has been a useful experience in terms of finding my future workplace.	4.64	.628	JF
15. The Job Fair gave me an increased sense of self-confidence for future job interviews.	4.46	.720	JF
16. I found workplaces at the Job Fair that I can imagine as my first workplace after graduation.	3.77	1.459	JF
17. I feel that the personalized/interactive format was a more effective way to learn in this course than a lecture format would have been.	4.82	.451	GEN
18. Overall, this course gave me the knowledge, confidence, and motivation to seek employment after graduation.	4.69	.731	GEN

The aspect-wise analysis results are depicted in Figure 2, in an ascending order of grand means. Although all studied aspects received scores ranging between 4 and 5, a discernible hierarchy emerges. General satisfaction emerged with the highest grand mean, affirming our primary hypothesis. Practical aspects, including CV writing, crafting motivation letters, and other career techniques, secured the second and third highest grand means. The job fair aspect ranked fourth, albeit with a high standard deviation, indicating variability in responses. Activities and tasks linked to personal development garnered the lowest grand means in this analysis.
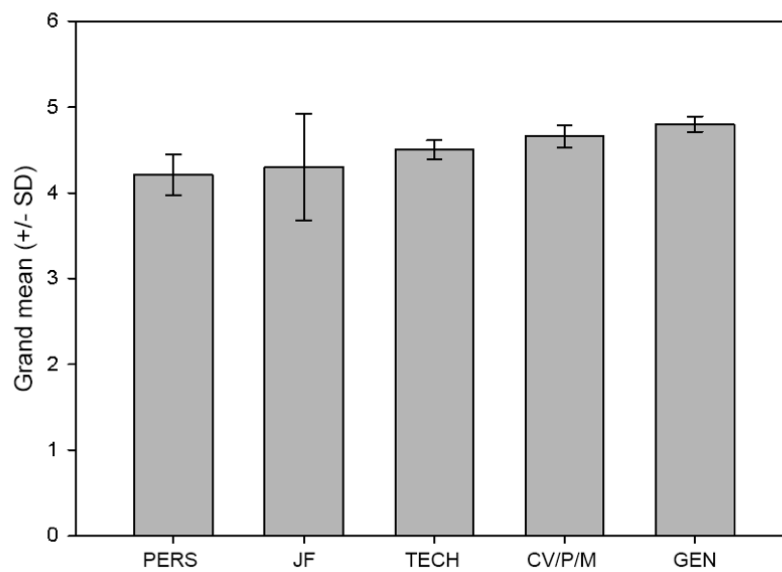

Figure 2. Results of the aspect-wise analysis. Bars represent grand means, error bars represent ±SD. The abbreviations are the same as in Table 9.

5. DISCUSSION

In the course of our study, our aim was to explore the key elements shaping communication between dentists and their patients. We sought to delve deeper into the prevalent factors that could impact the loyalty, contentment, and decision-making processes of dental patients. Additionally, we introduced a novel, student-focused career counseling program tailored for undergraduate dental students. This initiative marked a departure from the conventional teacher-centered and exclusively clinically oriented dental curriculum.

5.1. Patient satisfaction and loyalty

In this 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. 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.

It is crucial to emphasize that the concepts of satisfaction and loyalty are intricately connected. When we discuss factors that influence satisfaction and others that impact loyalty, it is not in an exclusive sense. Instead, these factors contribute to patients' positive attitudes toward their dentists, manifesting as both satisfaction and loyalty. The study aimed to explore patients' and dentists' perspectives rather than comprehensively mapping all the complex relationships among the explanatory variables. Furthermore, it is essential to note that the fit of our regression models is limited, indicating a significant amount of unexplained variance. In simpler terms, this study only uncovers a fraction of the factors that determine patient satisfaction and loyalty.

Studies from various regions worldwide have explored patient satisfaction and loyalty, particularly within the realm of general medicine (10, 22, 24, 25). Although there are a few dentistry-specific studies available (26-29, 50), we will draw upon these studies to support our analysis of the results.

Our findings align with the existing literature in two crucial aspects. First and foremost is the pivotal role of trust (21, 24). Patients' trust in their dentist's decisions concerning their dental care emerged as a significant predictor of both satisfaction and loyalty. As mentioned earlier,

the relationship between these two concepts is a topic of discussion in the literature, especially concerning the role of trust. Platonova and colleagues argued that patient satisfaction influences patient loyalty, both significantly impacted by trust (24). In contrast, AlOmari and Hamid suggested that repeated satisfactory experiences with the care provider cultivate trust, leading to loyalty. Consequently, satisfaction precedes and builds loyalty through trust (21). In our view, this latter explanation seems more plausible. While it is possible that established trust influences satisfaction in a self-fulfilling manner, we believe that initial satisfaction creates the foundation for trust and subsequent loyalty. In our patient population, trust in the dentist was generally high, marked as the third highest-scoring item with a mean of 4.91 points. Intriguingly, dentists tended to underestimate their patients' trust in them (mean of 4.08 points). Consequently, the matched item pair regarding trust had the lowest percentage of full patient-dentist agreement (25.9%). This phenomenon suggests a somewhat pessimistic view of patients held by dentists, although our data cannot provide a definitive explanation. As we have not found similar phenomena described in other studies, we consider this a population-specific observation. Nonetheless, based on our results, we concur with the literature that establishing patient loyalty necessitates the establishment of trust, ideally achieved by enhancing patient satisfaction. The best approach to increasing satisfaction, thus leading to greater loyalty, remains a subject open to exploration.

Across diverse cultural contexts, a consistent finding emerges: effective communication from the care provider significantly contributes to patient satisfaction and loyalty. This trend has been observed not only in Malta (26), the USA (29), Saudi Arabia (50), and the UK (27), but also in our results from Hungary, reinforcing the universality of this observation. Within the realm of dentistry, a key communicative strategy involves delivering thorough yet comprehensible descriptions of procedures, particularly right before initiating them. This practice has a significant impact on reducing patient anxiety, a crucial factor in dentistry (103). Additionally, providing professional explanations in simple language serves as the initial step in engaging patients, transforming them into active participants in their own care, a practice proven to heighten satisfaction levels (104). In our sample, dentists in Hungary demonstrated a keen understanding of these principles, evident in the highest-scoring items within the dentist group. These dentists emphasized the importance of displaying genuine interest in their patients' symptoms (4.94 points), employing easily understandable language (4.88 points), clearly elucidating dental issues (4.87 points), and involving patients in discussions about their

treatment plans (4.77 points). These priorities underscore the dentists' recognition of the pivotal role effective communication plays in fostering positive patient experiences and loyalty.

Even more significantly, several of these key items resurfaced among the highest-rated aspects in the patient group, signifying that patients did indeed encounter this patient-centered communication during their recent visits. Patients reported that their dentists provided clear explanations of their dental issues (4.91 points), expressed satisfaction with these explanations (4.91 points), exhibited genuine interest in their symptoms (4.90 points), and informed them about the specific procedure before commencing (4.90 points). Moreover, the item pairs with the highest full agreement percentages between dentists and patients were all linked to communication and explanation. This alignment revealed that dentists not only recognized the paramount importance of these aspects but also met their patients' expectations at an exceptionally high level.

It is hardly surprising that effective communication emerged as a significant predictor of both satisfaction and loyalty. Specifically, a dentist's perceived interest in a patient's symptoms significantly influenced satisfaction, while clear explanations about dental care using "understandable" language, descriptions of forthcoming procedures, and the presentation of multiple treatment plans significantly impacted loyalty. It is crucial to reiterate here that satisfaction and loyalty are intricately connected concepts. Thus, these findings indicate that the mentioned independent variables markedly contributed to a positive patient experience, translating into higher levels of both satisfaction and loyalty.

In summary, these outcomes affirm our prior understanding that tailoring the language of explanations regarding dental conditions and procedures to individual patients is paramount. Equally crucial is the provision of comprehensive explanations before all procedures, underlining the vital role of communication in enhancing patient satisfaction and loyalty.

Another intriguing aspect of our investigation concerns the personal bond between dentists and patients. Little and colleagues (22) underscored the significance of establishing a personal connection between healthcare providers and their patients. Platonova and her team similarly concluded that a strong personal relationship with the healthcare provider plays a pivotal role in patient satisfaction (24). Our findings echo these assertions: patients' subjective sense that their dentist truly understood them significantly influenced their satisfaction. Additionally, feelings of attachment and appreciation, as expressed through statements like "The people where I currently get my dental service matter to me," emerged as substantial contributors to

patient loyalty. However, what makes these results particularly interesting is that these specific items received relatively low scores among patients. Three out of the six items related to the personal rapport with the dentist fell into the lowest percentile. Although this does not necessarily imply that these relationships were perceived as definitively poor or weak (averaging between 3.91-4.27 points out of five, depending on the specific item), these aspects didn't come close to matching the significance attributed to communication items. In essence, while patients viewed their dentists as excellent communicators, the personal relationship with the dentist didn't stand out as a similarly noteworthy aspect of their dental experience. We regard this as a locally significant discovery, shedding light on the nuanced dynamics of patient-dentist relationships within our context. In Hungary, and likely throughout the entire post-Soviet bloc of Central Europe, the doctor-patient relationship is often perceived through a distinctly paternalistic lens (105). In this perspective, the medical care provider is viewed as an authoritative figure, someone with whom establishing a personal connection is deemed inconceivable. Their sole responsibility is seen as curing the physical ailment, essentially 'fixing' the patient. Additionally, Thompson and colleagues note that this form of medical paternalism is occasionally culturally accepted and even expected (106). In our experience with Hungarian patient populations, we have observed that patients often consider it impolite to initiate a personal connection with their healthcare provider. Simultaneously, healthcare providers tend to believe that forming such connections with patients is unwelcome or even ethically risky. This mutual cautiousness is palpable, despite both literature and our research indicating that a strong personal connection significantly contributes to a positive patient experience. Addressing this phenomenon in our geographical region requires a shift in mindset. We propose that incorporating a greater emphasis on this issue in courses related to medical/dental communication and medical ethics, which are already offered in all medical universities, could serve as a proactive approach. By highlighting the importance of fostering personal connections within the doctor-patient relationship, we can work toward transforming the prevailing paternalistic attitudes and fostering a more patient-centered healthcare environment.

A related matter is the dentist's familiarity with the patient's medical records, which significantly impacted satisfaction levels. Unlike personal relationships, this aspect delves into the realms of professionalism and competence. The corresponding item ("I'm confident that my dentist knows my medical records.") ranked 17th out of 25 items, with a score of 4.65, indicating that patients were not uniformly convinced of this aspect. However, it's crucial to

note the nuanced nature of this measure: unless dentists explicitly communicate their awareness of a patient's medical history, patients have limited ways to gauge this, let alone develop confidence in it. Some interactions might necessitate explicit signals of this knowledge, while others may not. Consequently, this item evaluates the patient's perception based on limited information. A mean score of 4.65 out of 5 is relatively high; however, the item's ambiguous wording raises questions in retrospect. Unless dentists explicitly convey their awareness of a patient's medical records, patients may find it challenging to be confident about this aspect. Therefore, while we acknowledge that a patient's impression of the dentist's knowledge about their medical data can enhance satisfaction, we hesitate to conclude that the dentists in this sample were unaware of their patients' medical history. The item's relatively low ranking (17th) likely stems from its vague phrasing, highlighting the need for clarity in future assessments of this nature.

While it was entirely expected that the perceived quality of treatment significantly influenced satisfaction, an unexpected revelation emerged regarding the impact of visit frequency on both satisfaction and loyalty. To our knowledge, this particular finding has not been previously reported in the literature. Although Lamprecht and colleagues briefly mentioned the importance of convenient appointments, they did not delve into the aspect of visit frequency explicitly (51). Surprisingly, dentists themselves seemed unaware of this factor's significance. Visit frequency received the second lowest mean score in the dentist group (3.81 points), indicating that dentists did not consider it highly important. Patients' responses echoed this sentiment: satisfaction with visit frequency ranked 15th among patients and exhibited the highest level of patient-dentist disagreement and the third lowest percentage of full agreement (27.2%). This disparity aligns with the observations made by Riley III et al. (29), indicating that visit frequency could potentially be a source of dissatisfaction for patients, even though dentists were not fully cognizant of its importance. While previous studies have not specifically highlighted this issue, it intuitively follows that tailoring visit frequency to meet individual patient needs would enhance satisfaction. Consequently, we propose that dentists should be mindful of this phenomenon and prioritize determining an optimal recall schedule tailored to each patient, thereby bolstering patient satisfaction and loyalty.

Research findings indicate that female healthcare providers often engage in longer consultations, offer more information, and provide explicit reassurance and encouragement, contrasting with their male counterparts (46, 49, 107). Studies have shown that patients tend to adjust their responses based on their clinician's gender, irrespective of their own gender (48,

108). Moreover, the gender composition of the patient-provider relationship can influence overall patient satisfaction (109). Given these observations, we anticipated a significant impact on the overall patient experience based on the gender of the patient, physician, or their concordance. Surprisingly, neither the patient's gender, the dentist's gender, nor their concordance had a significant effect on satisfaction or loyalty. Explaining this discrepancy is challenging, especially considering the consistent findings on gender effects reported in various studies across cultures and healthcare contexts. Our results diverge from the existing literature in this regard. One plausible explanation could be the potential mediating role of the personal connection between the dentist and the patient. Although not explicitly studied before, our results raise the possibility that the level of personal connection, which was suboptimal in our sample, might act as a permissive factor. Below a certain threshold of personal connection, the effects of gender might not be evident, or they might manifest to a much lesser extent. It is important to note that this is a hypothesis based on our findings, lacking empirical data or supporting references. However, exploring this assumption from a psychological perspective could be a valuable avenue for future research.

Regarding demographic factors, the only significant influence on patient satisfaction was the alignment between the patient's residence and the dental office location. This finding likely stems from the convenience of visiting a nearby dental office rather than one situated farther away. Lamprecht and colleagues also arrived at a similar conclusion in their research (51).

Our research findings provide compelling evidence for the positive influence of effective communication, trust, and personalized rapport between patients and dentists in enhancing patient satisfaction and nurturing loyalty. Our study has corroborated well-established factors such as using patient-friendly language in professional explanations and the dentist's explicit attention to patient symptoms, transcending cultural boundaries and offering valuable guidelines for improving the patient experience. However, our results also highlight the importance of understanding local patient preferences. Particularly noteworthy is our study's pioneering identification of the potential role of recall frequency in shaping the patient experience, offering a context-specific insight.

This underscores the necessity of continuous assessment of patient experiences, actively seeking feedback on practice strengths and weaknesses, and creating channels for patients to contribute ideas for improvement. Implementing a concise and anonymous patient satisfaction survey, prominently displayed within waiting rooms, could serve as an effective method for collecting invaluable insights. In terms of future research, our study raises intriguing questions

and only scratches the surface in identifying factors influencing patient satisfaction and loyalty. The limited model fit in our regression models suggests the existence of other influential variables. This limitation may stem from our use of questionnaire items already explored in the literature, which naturally restricted the scope of our research. To delve deeper, investigating patients' own narratives (through open-ended questions) about what contributes to their satisfaction with their dentist or influences their loyalty could prove a fruitful avenue for further exploration.

Considering the study's strengths and limitations, certain aspects merit attention. The substantial size of the patient sample stands as a notable strength, coupled with the comprehensive integration of both patient and dentist perspectives. However, it is crucial to acknowledge specific limitations. While the patient sample is substantial, its lack of representativeness across the broader Hungarian population must be acknowledged, a limitation further exacerbated by the relatively modest dentist sample. Moreover, the sampling process introduced a degree of self-selection bias. Finally, it is pertinent to emphasize that the regression models exhibit limitations in model fit, characterized by significant unexplained variance. This demands cautious interpretation of the results.

5.2. Decision making and the compromise effect

Our initial hypothesis regarding the price-only arrangement suggested the presence of the compromise effect across all price categories. However, this hypothesis was only partially supported by the findings. Additionally, we hypothesized that the introduction of additional information would modify these effects in a manner dependent way on both the arrangement and price category, a notion that received validation from our results. Overall, our findings indicate that the studied population did not consistently apply the compromise heuristic.

In the first price category, without the additional information, respondents consistently favored the low- or lower-priced option. While consumers often use price as a proxy for quality (110), this phenomenon did not hold true in this context. It appeared that respondents predominantly opted for the most economical choice. However, when provided with the extra information, indicating an expected lifespan, 10% fewer respondents chose the expensive option, with the middle option gaining preference. This observation aligns with the longstanding understanding that technical terms may lack information value for non-professionals.

Moving to the second price category with a price-only approach, respondents continued to favor the low- or lower-priced option. The introduction of additional information, specifically the

expected lifespan, led to a different pattern: 20% fewer respondents chose the low-priced option, and the high-priced option saw a 2% increase in preference, making the middle option the most popular choice. This shift indicates a genuine informed compromise. It appears that the inclusion of expected lifespan as information facilitated a more informed decision-making process, enabling a genuine cost-benefit assessment for the respondents.

In the third price category, we anticipated a significant impact from the additional information, given the literature's emphasis on the importance of preserving one's teeth among patients (91, 92). Surprisingly, this effect was not observed in our sample. The choices based solely on price followed the usual pattern, with a preference for the lower price. Interestingly, even with the additional information, the choice pattern remained largely unchanged. This discrepancy might indicate cultural differences, as the aforementioned studies were conducted in countries with distinct cultural contexts. Another possibility is that respondents felt uncertain about making decisions regarding treatment approaches. In Hungary, a paternalistic model of the patient-doctor relationship prevailed until recently (105). While the situation has definitely improved, there still remains a belief in certain matters that "the doctor knows best."

In the fourth price category, the compromise effect was evident when only prices were provided. Upon introducing information about the modernity of the treatment, the preference for the middle-priced option became even stronger. One interpretation could be that respondents struggled to differentiate between "modern" and "innovative," causing confusion. Additionally, for some respondents, the term "innovative" might imply limited experience with the proposed method, diminishing the sense of safety.

The results from the fifth price category are particularly intriguing. In the three-choice, price-only scenario, 85% of respondents chose the two more expensive options, with the middle option being slightly dominant by 5%. More fascinatingly, in the high-middle pairing, 63% of respondents favored the high-priced option. With the additional information, the high-priced option became significantly dominant (61%) in the three-choice arrangement. This unique pattern was not observed in any other category, suggesting that our respondents prioritized aesthetics to such an extent that it outweighed cost considerations even in the most expensive category.

Based on these findings, and considering the limitations discussed below, we can conclude that people's dental treatment choices may not be inherently guided by the compromise heuristic, even when they have limited information available, such as the treatment name and prices of

different options. This divergence could stem from the unique nature of dental and medical decisions, which fall under a category known as a limited decision scenario (111). Unlike everyday consumer decisions, these choices involve not just a product or service quality but, fundamentally, the patient's health and health-related quality of life.

The additional information provided varied in its effectiveness in aiding respondents' informed choices. Technical terms were found to be unhelpful, aligning with the well-established understanding of their unsuitability in doctor-patient communication. In contrast, the study revealed that expected lifespan emerged as a crucial piece of information supporting informed decisions. The impact of minimal invasiveness on choices remained inconclusive and requires cautious interpretation. A vague reference to the novelty of the planned intervention did not significantly influence informed decisions. The most surprising finding was the overwhelming impact of aesthetics; respondents were unexpectedly inclined to choose the high-priced option in the highest price category, indicating the remarkable influence of aesthetic considerations on decision-making.

What do these findings indicate in a broader context? To begin with, 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 of these 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.

Undoubtedly, this study comes with its set of constraints. Primarily, the limited existing literature on the topic necessitated this study to function as a pilot, primarily descriptive in nature, aiming to initiate discussions rather than definitive conclusions. Secondly, the study did not involve real-life decision-making scenarios. Completing a questionnaire significantly differs from making decisions about one's own treatment, a considerably more complex and high-stakes situation. Additionally, there was an overrepresentation of respondents with a high school education in the sample. Despite these limitations, 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.

5.3. The student-centered career counseling course

By designing a career skills course for dental students, our intention was to tackle a fundamental yet crucial issue: within our education system, centered around teachers and academic knowledge, newly graduated dentists often discover that while they have learned the entirety of the profession at the university, they have received little guidance on how to perceive themselves as professionals or individuals embarking on a career. This lack of self-assurance and clarity can exacerbate the already limited communication skills of recent dental graduates. Consequently, transitioning into a job after obtaining the diploma becomes challenging, potentially leading to heightened uncertainty, disillusionment, and even departure from the profession. Insufficient career skills and a lack of professional self-concept may result in misguided career choices and subsequent job dissatisfaction, culminating in burnout. Individuals find themselves trapped in a situation that significantly deteriorates their quality of life. Although not unique to dentistry, as highlighted in the introduction, dentistry stands out as an exceptionally stressful profession. This stress is not limited to chairside work; even roles such as dental teaching (112) or dental leadership (113) can be equally stressful. We contend that cultivating self-awareness about one's professional identity, making deliberate career choices, and possessing a thorough understanding of the opportunities available with a dentistry degree (such as mobility) can serve as vital coping resources.

We deemed it essential to incorporate this course into the curriculum with a credit value, and there are two primary reasons for this choice. First, even if the course is not mandatory, being part of the curriculum sends a strong message that the faculty considers its content integral to the profession. Second, assigning credit value implies that students are acknowledged for their participation in terms of academic progress. This aspect holds significance because students in our dental school, particularly in their final year, operate on a tightly packed schedule. They meticulously evaluate the cost-benefit ratio of every subject they choose to undertake. Consequently, they might forgo an optional course, even if they find it interesting or beneficial. Through this format (an optional course within the curriculum for credit), we managed to attract an above-average number of participants for a final-year optional course in the Hungarian group and an average level of participation in the English-speaking group. The reason for the latter could be that only a fraction of our English-speaking students are interested in Hungarian career

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options, specifically those planning to practice or specialize in Hungary after graduation. This insight highlights the need to refine the English component of the course to cater to a broader spectrum of our English-speaking students.

Our hypotheses, as outlined previously, found support in the results. 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 (item #17; 4.82 ± .451) and the opportunity to learn effective CV writing (item #1; 4.85 ± .366) 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. Interestingly, the item with the lowest score was #16 ("I found workplaces at the Job Fair that I can imagine as my first workplace after graduation."). This outcome was anticipated, as the job fair offers a limited, primarily local sample of employment options. It functions more as a training ground where students can practice interacting with potential employers, albeit with minimal real-life job risks. Despite this, the job fair received a high score overall, with item #14 ("I think that the Job Fair has been a useful experience in terms of finding my future workplace.") receiving a rating of 4.64 ± .628. 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, as mentioned earlier. Hence, the scores do not necessarily signify dissatisfaction but rather the novelty of the situation. 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. Another possibility is that statements like "The assessment of my personal character traits, strengths, and weaknesses helped me to clarify what career fits me best." (item #2) might be too complex to rate accurately immediately after the course, given that such changes likely require more time. In this regard, the results may simply highlight the imprecise wording of the corresponding item, prompting us to reconsider these statements before future use. This interpretation finds support in the results of the aspect-wise analysis (Figure 2), which reinforce these conclusions.

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. This contrasts with findings from studies describing the challenges of incorporating student-centered elements into teacher-centered curricula (114, 115). We

propose that the course's success can be attributed to several key factors. Firstly, the course's subject matter and its position in the curriculum are significant. It is well-established that the opportunity to articulate meaningful personal learning objectives engages students in profound learning processes (83, 116, 117). For senior students, embarking on a career is an immediate and tangible personal goal, making it a logical and meaningful objective. Lower-grade students might have found the course less captivating. Secondly, the course's credit value played a vital role. By offering academic credits, the course not only equipped students with crucial and personally relevant skills but also contributed to their academic progress. Lastly, the course was developed and delivered by faculty members committed to the concept of student-centered education, eliminating any issues related to faculty reluctance.

Undoubtedly, a limitation of this study lies in its ability to evaluate only short-term effects and impressions. To enhance accuracy and reduce subjectivity, we intend to incorporate tests measuring diverse aspects of career readiness, akin to the approach adopted by Hur and colleagues in their study of medical students (98). Additionally, the lasting impact of the course remains undetermined at this juncture. Addressing this query necessitates organizing follow-up assessments.

6. SUMMARY AND CONCLUSIONS

In summary, based on the results of the studies covered in this thesis, we draw the following conclusions, which we also 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.

7. ACKNOWLEDGEMENTS

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APPENDIX

Factors of patient satisfaction in dental care

The purpose of this research questionnaire is to gather information on patient-dentist relationship and explore what influences patients' satisfaction with their dentist and dental visits/treatments. Although we would be grateful if you could fully complete the questionnaire, you can skip any question you do not wish to answer. The questionnaire is anonymous. Please do not provide any information that could identify you. However, you may leave comments on the backside if you feel that you would like to share something with us. Thank you for your help and cooperation.

Answer the following questions by circling the **number that best reflects your feelings**.
Options: 1= Strongly disagree, 2= Disagree, 3= Neither agree nor disagree, 4= Agree, 5= Completely agree.

1. **Sex:**
    Female
    Male

2. **Age:** ………… (years)

3. **Highest level of education:**
    Primary school
    Secondary school
    University/High school
    Postgraduate (PhD)

4. **Type of residence:**
    Capital
    County seat
    Other city/town
    Village
    Farm, hamlet

5. **Name the dental office you regularly attend:**

    ……

6. **The people where I currently get my dental service matter to me (1).**
Strongly disagree   1   2   3   4   5   Completely agree

7. **I have developed a personal relationship with my current dentist (2).**
Strongly disagree   1   2   3   4   5   Completely agree

8. **I trust this dentist's judgments about my medical care (2).**
Strongly disagree   1   2   3   4   5   Completely agree

9.   I'm confident that my dentist knows me (3).
Strongly disagree   1   2   3   4   5   Completely agree

10. I'm confident that my dentist knows my medical records (3).
Strongly disagree   1   2   3   4   5   Completely agree

11. I would recommend my dentist to others (2).
Strongly disagree   1   2   3   4   5   Completely agree

12. I am very committed to continuing a relationship with my dentist (4).

Strongly disagree   1   2   3   4   5   Completely agree

13. For me, the costs in time / money / effort to switch dentists are high (2).
Strongly disagree   1   2   3   4   5   Completely agree

14. I possess good knowledge of health care services (5).
Strongly disagree   1   2   3   4   5   Completely agree

15. I am quite experienced in the health care area (5).
Strongly disagree   1   2   3   4   5   Completely agree

The questions below refer to your last visit at your dentist

16. How many times have you been to your current dentist? < 10 times / > 10 times

17. The dentist was interested in my worries about my problem (3).
Strongly disagree   1   2   3   4   5   Completely agree

18. The dentist was interested when I spoke about my symptoms (3).
Strongly disagree   1   2   3   4   5   Completely agree

19. The dentist was interested in the effects of the problem on my family or private life (3).
Strongly disagree   1   2   3   4   5   Completely agree

20. The dentist explained clearly what the problem was (3).
Strongly disagree   1   2   3   4   5   Completely agree

21. The dentist was careful to explain the treatment plan (3).
Strongly disagree   1   2   3   4   5   Completely agree

22. The dentist encouraged me to ask questions about my treatment (6).
Strongly disagree   1   2   3   4   5   Completely agree

23. The dentist used words that were understandable in talking about my dental care (6).
Strongly disagree   1   2   3   4   5   Completely agree

24. The dentist told me what s/he was going to do before starting the procedure (6).
Strongly disagree   1   2   3   4   5   Completely agree

25. I am satisfied with the duration of the appointments (6).
Strongly disagree   1   2   3   4   5   Completely agree

26. I am satisfied with the frequency of the appointments (6).
Strongly disagree   1   2   3   4   5   Completely agree

27. I am satisfied with the quality of the treatment (6).
Strongly disagree   1   2   3   4   5   Completely agree

28. I am satisfied with the explanation given by the dentist (6).
Strongly disagree   1   2   3   4   5   Completely agree

29. The dentist offered me the choice between more than one treatment plan (3).
Strongly disagree   1   2   3   4   5   Completely agree

30. The dentist discussed the treatment plan with me (3).
Strongly disagree   1   2   3   4   5   Completely agree

31. The dentist reached agreement with me on the treatment plan (3).
Strongly disagree   1   2   3   4   5   Completely agree

The sources of the items (see in brackets after the items)

1.   Burnham T, Frels J, Mahajan V. Consumer switching costs: A typology, antecedents, and consequences. *J Acad Mark Sci*. 2003;31:109-26.

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6.   Al-Mobeeriek A. Dentist-patient communication as perceived by patients in Riyadh, Saudi Arabia. *Int J Occup Med Environ Health*. 2012;25(1):89-96.

Factors of patient satisfaction in dental care

The purpose of this research questionnaire is to gather information on patient-dentist relationship and identify those factors that, in your opinion, influence your patients' satisfaction with their dental treatments. Although we would be grateful if you could fully complete the questionnaire, you can skip any question you do not wish to answer. The questionnaire is anonymous. Please do not provide any information that could identify you. However, you may leave comments on the backside if you feel that you would like to share something with us. Thank you for your help and cooperation.

Answer the following questions by circling the **number that best reflects your feelings**.
Options: 1= Strongly disagree, 2= Disagree, 3= Neither agree or disagree, 4= Agree, 5= Completely agree.

1. **Sex:**
   Female
   Male

2. **Age:** ………… (years)

3. **For how many years have you been working as a dentist?** ………… (years)

4. **Where is the dental office you work for located?**
   Capital
   County seat
   Other city/town
   Village
   Farm, hamlet

5. **I think patients trust their dentist's judgments about their medical care.**
   Strongly disagree   1   2   3   4   5   Completely agree

6. **I think my patients would recommend me to others.**
   Strongly disagree   1   2   3   4   5   Completely agree

7. **I think my patients are very committed to continuing a relationship with me.**
   Strongly disagree   1   2   3   4   5   Completely agree

8. **Most of the patients possess good knowledge of health care services.**
   Strongly disagree   1   2   3   4   5   Completely agree

9. **The most important characteristic(s) influencing satisfaction with the dentist's care for patients is/are:**
   ....

....

10. It matters to the patients that their dentist shows interest when they speak about their symptoms.
Strongly disagree   1   2   3   4   5   Completely agree

11. It matters to the patients that their dentist explains clearly what the problem is.
Strongly disagree   1   2   3   4   5   Completely agree

12. It matters to the patients that the dentist is careful to explain the treatment plan.
Strongly disagree   1   2   3   4   5   Completely agree

13. It matters to the patients that the dentist encourages them to ask questions about their treatment.
Strongly disagree   1   2   3   4   5   Completely agree

14. It matters to the patients that their dentist uses words that are understandable in talking about their dental care.
Strongly disagree   1   2   3   4   5   Completely agree

15. It matters to the patients that their dentist tells them what s/he is going to do before starting the procedure.
Strongly disagree   1   2   3   4   5   Completely agree

16. The duration of an appointment matters to the patients.
Strongly disagree   1   2   3   4   5   Completely agree

17. The frequency of appointments matters to the patients.
Strongly disagree   1   2   3   4   5   Completely agree

18. The quality of the treatment matters to the patients.
Strongly disagree   1   2   3   4   5   Completely agree

19. I think it is important to offer my patients the choice between more than one treatment plan.
Strongly disagree   1   2   3   4   5   Completely agree

20. It matters to the patients that their dentist discusses the treatment plan with them.
Strongly disagree   1   2   3   4   5   Completely agree

21. It matters to the patients that their dentist reaches agreement with them on the treatment plan.
Strongly disagree   1   2   3   4   5   Completely agree

Article

Factors Influencing Patient Satisfaction and Loyalty as Perceived by Dentists and Their Patients

Réka Magdolna Szabó [1], Norbert Buzás [1], Gábor Braunitzer [2], Michele Goldzieher Shedlin [3] and Mark Ádám Antal [4,*]

1 Department of Health Economics, Faculty of Medicine, University of Szeged, 6720 Szeged, Hungary; antal-szabo.reka@med.u-szeged.hu (R.M.S.); buzas.norbert@med.u-szeged.hu (N.B.)
2 dicomLAB Dental, Ltd., 6726 Szeged, Hungary; braunitzer.gabor@gmail.com
3 Rory Meyers College of Nursing, New York University, New York, NY 10012, USA; mshedlin@aol.com
4 Department of Operative and Esthetic Dentistry, Faculty of Dentistry, University of Szeged, 6720 Szeged, Hungary
* Correspondence: antal.mark@szte.hu; Tel.: +36-62-645-299

Abstract: Objective: This study aimed to identify the key aspects of patients' dental care experience that influenced their self-perceived satisfaction and loyalty. Also examined was the agreement between patients and dentists regarding these factors. Methods: Questionnaires were administered to 1121 patients and 77 dentists, focusing on demographic information and 15 selected items related to the patients' last dental visit. Descriptive and linear regression analyses were conducted. Results: The study included participants from 41 practices. Factors significantly influencing satisfaction and loyalty included location convenience, treatment quality, trust in dentists' decisions, visit frequency satisfaction, clear treatment explanations, dentist's interest in symptoms, patient-dental personnel attachment, and dentist's knowledge of the patient and their medical records. While overall agreement between patients and dentists was high, some areas exhibited notable disagreement. Conclusions: The findings mostly align with existing literature, underscoring the importance of communication, trust, and a personal patient-dentist relationship in promoting satisfaction and loyalty. However, they also show that local, generally not reported factors might be at play, which necessitates dentists' awareness and consideration of the local context for optimal outcomes.

Keywords: loyalty; dental communication; dentist-patient communication; patient satisfaction

1. Introduction

Patient experience and practitioner communication as part of the overall patient experience are key factors of patient adherence [1,2], which means that these factors significantly contribute to therapeutic success or failure. It holds particularly true in the case of dentistry. While there exist numerous recognized medical phobias [3–6], odontophobia or dental fear ranks among the five most prevalent fears [7–9]. This interferes with attendance [10,11], and complete avoidance of the dentist may well be regarded as the ultimate therapeutic failure (with profound effects on the oral health of the public). Therefore, in dentistry, it is of utmost importance to provide a patient experience that leads to satisfaction, positive attitudes toward the dentist and the practice, and, in turn, a willingness to regularly attend. This has been frequently studied in the context of general practice [1,12–16], but less frequently regarding dentistry [17–19].

Patient satisfaction has been reported to be a multi-factorial phenomenon, with a complex set of objective and subjective elements [20]. Studies have reported that the quality of dentist-patient communication is related to patient satisfaction [20–22]. In the field of general medicine, studies have pointed out that patients prefer to be involved in the decision-making [23–25], and the few studies that are available on this specific question in dentistry, show the same [26,27]. It is also known that the perceived service quality

influences patient loyalty through the effect of patient satisfaction which plays a key role in promoting patient loyalty [28].

Numerous studies have stressed the importance of communication in dentistry [29–31] and a few important conclusions have already been drawn regarding the success of dental communication. It has been shown that verbal communication in itself can influence patients' satisfaction with treatment outcomes [32]. However, some studies indicate that dentists do not exploit this potential. For instance, Rozier and colleagues, in a large-sample, national-level survey, showed that US dentists utilized a narrow range of communication strategies and recommended more professional education in this area [33]. The quality of communication between the medical professional and the patient might be influenced by certain demographic and personal factors and concordances [34]. In a general medical setting, race concordance between the physician and the patient was found to result in longer visits characterized by more patient-positive affect [35]. Similar conclusions were drawn in connection with shared personal beliefs and values [36]. It is interesting that the gender of the dentist or physician also appears to be a key factor. Riley III et al. found that a male dentist was less likely to be aware of the importance of sharing information about the procedure to be performed than a female dentist [20]. The authors also reference Hall et al. [37], suggesting that healthcare providers may offer additional information and support to female patients. This is not necessarily due to assumptions about the health needs of women, but rather because female patients tend to openly express their feelings, concerns, questions, and preferences during discussions about medical choices. In addition, Thornton et al. suggest that sex concordance and age concordance can influence the quality of communication between the physician and the patient [38]. While the sex effect is well-known and studied [37,39,40], the effect of age and age discordance has been studied less often [17]. Several specific characteristics that determine good dentist-patient communication and lead to greater patient satisfaction have also been identified. To mention just a few: Most of the studies dealing with this topic found that a good explanation of the condition and its treatment is of utmost importance [16,20,41]. The treatment plan should be formulated through discussion and agreement [16]. It is similarly important that the dentist should explain what is going to happen before starting the procedure [41] and that the dentist should show interest when the patient is talking about his or her problems [16]. Finally, the importance of communication in dentistry is shown by the results of Lamprecht et al., who, in their study of patients' criteria for choosing a dentist, found that dentists' psychosocial skills appear to be the most important criteria for choosing a dentist [42].

Extra-communicative factors that may contribute to patient satisfaction and loyalty include trust in the physician's judgments regarding one's care and a good personal relationship between the patient and the care provider [12] or the patient's level of knowledge about the healthcare services [43]. These factors and many others have been identified in different social and cultural settings, so they do not necessarily apply to any patient population.

An additional problem is that the opinions of the patient and the dentist regarding optimal and desirable dentist-patient communication may differ. Riley III et al. asked 197 dentists and their 5879 patients about patient satisfaction, seeking to identify concordance patterns [20]. Most of the patients were highly satisfied and the dentists correctly predicted this. However, among patients who were less than satisfied, there was a substantial subset of cases where the dentist was not aware of the patient's dissatisfaction. It follows that to have a realistic picture of dentist-patient communication that can inform practice, the perspectives of both parties should be examined and compared [44–46].

In this study, our primary aim was to explore which aspects of the patients' experience of their dental care influenced their self-perceived satisfaction and loyalty the most. To this end, we developed a questionnaire based on the literature [1,12,16,41,43,47], in which the patients were asked about their last visit to their dentist. A significant portion of the selected items characterized the patient experience and the communication of the dentist, but a

few items raised general issues like the frequency, length, quality of the visits, satisfaction, and loyalty.

Our secondary aim was to examine the agreement between the patients' experience and their dentists' opinion about the importance of the same satisfaction- and loyalty-influencing aspects that the patients were asked about. This was achieved by a questionnaire created especially for dentists. This shorter questionnaire contained demographic items and 15 selected items that mirrored the corresponding items in the patient questionnaire, rephrased from the dentist's perspective.

We formulated our hypotheses based on results published in the literature. Regarding the primary aim, we hypothesized that the dentist's communication would be a major contributing factor to satisfaction and loyalty, especially clear language and good explanations. Regarding the secondary aim, we expected a generally high level of agreement over most of the items, with a few areas of disagreement.

2. Materials and Methods

2.1. Participants, Study Procedures, and Data Processing

Altogether 85 private dental practices from all over Hungary were contacted by email and invited to participate in this cross-sectional study. Our selection of practices for participation was not based on specific criteria; rather, we reached out to all 85 private dental practices for which we possessed contact information.

Sample size was calculated using G*Power 3.1 (Universität Düsseldorf, Düsseldorf, Germany). Assuming a multiple linear regression analysis, a significance level of $p < 0.05$, a medium effect size ($f^2 = 0.15$), and the inclusion of 32 independent variables, the necessary sample size was projected to be $N = 214$. However, in the final analysis, we had a sample size of $N = 1121$, resulting in an achieved power of 1.0 ($\lambda = 168.15$, critical F = 1.45).

Of the contacted 85 practices, 41 agreed to participate. These practices were sent the electronic version of both the patient and the dentist questionnaires for printing and on-site administering, with instructions on how to administer the questionnaire. Consultation with the researchers was available at any time online or in person. In each practice, a dental assistant was tasked with administering the questionnaire to the participating dentists and their patients. The questionnaire was always administered in a quiet room, where the participant (either a dentist or a patient) was left alone to fill it in, after having received brief instructions that also appeared on the questionnaire itself in writing. Once all questionnaires in a practice had been filled in, they were sent back to the researchers who entered the responses into an Excel sheet. The responses were entered in a way that a patient's response to a given item was always matched with that of his or her dentist so that agreement could be calculated between a dentist and his or her patients. When all questionnaires from all participating dentists had been received, the dataset was cleaned (data from dentists with less than 5 patients were removed, as well as the data of their patients), and the questions were coded for the blinded analysis. The coded datasheet was then sent to the independent evaluator for analysis (see Statistical analysis).

Participation was voluntary and anonymous for both the dentists and their patients. All dentists of all participating practices were invited to complete the questionnaire and to invite their patients to do so (i.e., recruitment took place on a self-selection basis). The inclusion and exclusion criteria for participant selection in this study encompassed active dental practitioners from the participating dental practices and patients who voluntarily agreed to participate, were native Hungarian speakers, and possessed the requisite cognitive capacity to comprehend the study's objectives and questionnaire content. Exclusion criteria applied to individuals unable to provide informed consent or with limited cognitive ability to understand the study materials. Both the dentists and the patients signed an informed consent form. The informed consent forms were stored separately and did not contain any identifier that could allow making a connection between the questionnaires and the forms. The manager of the practice invited the dentists to participate, and those who agreed and filled in their questionnaire invited their patients. Patients and dentists

were assigned a number on the site for the statistical analysis, but this number was never associated with any identifier. In this way, personal data were not processed in the study.

The study was approved by the Hungarian Medical Research Council's Scientific and Research Ethical Committee (Approval number: IV/4834-2/2020/EKU).

2.2. The Questionnaires

2.2.1. The Patient Questionnaires

First, the patient questionnaire of 31 items was developed (Supplementary File S1). This contains six demographic items (Nos. 1 to 5 and 16), and the remaining 25 items were adapted from the literature on patient experience, satisfaction, loyalty, and practitioner-patient communication or used in their original form [1,12,16,41,43,47]. Adapting an item was necessary when it was originally used in the context of general medicine and worded accordingly. In these cases, the word "doctor" or "physician" was replaced with "dentist". An example is item No. 12 ("I am very committed to continuing a relationship with my physician") taken from Wang et al. [1], which appears as "I am very committed to continuing a relationship with my dentist" in our questionnaire.

Regarding satisfaction, we accepted the argument of Reichheld who proposed that the single most important measure of customer satisfaction is whether the customer would recommend a product or service to others [48]. As for loyalty, we accepted the definition by Oliver, who defines loyalty as "a deeply held commitment to re-buy or re-patronize a preferred product or service consistently in the future, despite situational influences and marketing efforts having the potential to cause switching behaviour" [49]. Two items specifically referred to satisfaction (I would recommend my dentist to others) and loyalty (I am very committed to continuing a relationship with my dentist). Because of their unambiguous phrasing and as they fit the concepts described in our definitions, we considered these the most suitable for the assessment of satisfaction and loyalty.

2.2.2. The Dentist Questionnaires

Having decided on the questions to include in the patient questionnaire, we developed the dentist questionnaire of 19 items (Supplementary File S2). Of these 19 items, 4 are demographic items, and 15 are the matched pairs of 15 items of the patient questionnaire. These 15 items were selected because they both covered important issues and were capable of being rephrased from the dentist's perspective in a meaningful way so that the agreement between the opinion of the dentist and the experience of the patient could be assessed. In these cases, the dentists were asked about their opinion on a specific issue, and their patients were asked about the same issue regarding their last visit to their dentist. In this respect, we modeled our study on that of Riley and colleagues [20]. An example of such a matched pair is item No. 18 in the patient questionnaire ("The dentist was interested when I spoke about my symptoms.") and item No. 9 in the dentist questionnaire ("It matters to the patients that their dentist shows interest when they speak about their symptoms."). The aim of the dentist questionnaire was primarily to allow comparison with the patients' perspective. Therefore, the dentist questionnaire contained fewer items than the patient questionnaire, where we considered a wider range of factors that could potentially influence satisfaction and loyalty. The dentist questionnaire was not developed as a standalone instrument, it was meant as a descriptive complement to the patient questionnaire.

All items in both questionnaires were 5-grade Likert-type statements, except for the demographic items, and one binary item where patients were asked to tell if they had visited their dentist more or less than 10 times by the time of the study (item No. 16).

2.2.3. Pre-Testing and Psychometric Characteristics

Before administering the questionnaires to the study sample, a pilot test was conducted involving 25 dentists and 100 patients. The aim of this test was to assess the questionnaire's reliability, internal consistency, and underlying factor structure. It's important to note that the dentists and patients from the pilot sample were excluded from the final study sample.

For evaluating the factor structure of both questionnaires, an exploratory factor analysis (EFA) with principal component analysis was utilized, employing varimax rotation to ascertain item loadings within factors. Determining the number of factors to retain in the final model involved using the Kaiser factor retention method, assessing eigenvalues above 1, and employing a screen test. Item factor loadings were scrutinized, with a threshold of 0.50 used for item inclusion. As anticipated based on item selection, both questionnaires exhibited a clear two-factor arrangement. One factor pertained to the patient's overall experience and personal rapport with the dentist, while the other encompassed communicative aspects like language usage. The study's dependent variables aligned with the first factor. The Cronbach's alpha values were calculated at 0.75 for the patient questionnaire and 0.79 for the dentist questionnaire.

Upon completion of the study sample dataset, a reevaluation of the questionnaires' psychometric properties was undertaken. Both questionnaires maintained the same two underlying factors observed in the pilot phase. The patient questionnaire (N = 1121) exhibited the following characteristics in the final analysis: Bartlett's test for sphericity yielded significance (χ^2 = 10,544, df = 300, $p < 0.01$), the Kaiser-Meyer-Olkin (KMO) test for sampling adequacy produced an overall value of 0.904 (0.720–0.944), and Cronbach's alpha was calculated at 0.84. Similarly, the dentist questionnaire analysis (N = 77) revealed significant results for Bartlett's test (χ^2 = 290, df = 120, $p < 0.01$), an overall KMO value of 0.608 (0.464–0.805), and a Cronbach's alpha of 0.71. The somewhat lower values for the dentist questionnaire were to be expected, considering its auxiliary role as a descriptive complement to the patient questionnaire, rather than a standalone instrument.

The questionnaires were administered in Hungarian. To enable the use of the questionnaire with Hungarian patients and practitioners, the questionnaires were translated according to accepted international standards [50].

The questionnaires are attached as supporting documents in English with an indication of the sources of the items.

2.3. Statistical Analysis

2.3.1. Descriptive Statistics and Hypothesis Tests

For the statistical analyses, SPSS 26.0 (IBM, Armonk, NY, USA) was used. For the descriptive characterization of the continuous variables, means, standard deviations, and the 95% confidence interval were used. The Likert-type responses were treated as continuous variables for all purposes as they represent degrees, not discrete choices. Categorical variables were described with frequencies. For hypothesis testing regarding the influencing factors of satisfaction and loyalty, regression analysis was used. In these regression models, Items 11 (regarding overall satisfaction) and 12 (regarding loyalty) from the patient questionnaire were the dependent variables, and the independent variables independent variables were the rest of the items. Note that items 25 to 28 in the patient questionnaire also explicitly refer to satisfaction, but in relation to specific aspects rather overall satisfaction, and were therefore used as independent variables. The practitioners' demographic items (age, sex, location, and professional experience in years) were also included in these analyses. As the literature suggests that various demographic concordances between the practitioner and the patient (such as being of the same sex or being close in age) may influence the overall patient experience [36,51], we calculated three additional variables (location concordance, sex concordance, and age difference), and these were also added as independent variables.

2.3.2. Dentist-Patient Comparisons

Agreement between dentists' and patients' responses was characterized in two ways. On the one hand, we determined which statements (items) the respondents agreed with the least and the most. This was done by calculating 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 with and items scoring ≥the 75th percentile limit were considered the

most agreed with. On the other hand, we introduced the variable "degree of disagreement" (DD), which was calculated for all 1121 dentist-patient response pairs, for all 15 matched item pairs, regardless of whether they appeared as significant factors in the satisfaction and loyalty analyses. DD was calculated as follows: if the patient's score (PS) was lower than the dentist's (DS), then PS was subtracted from DS and the result was multiplied by −1 (to express the direction of disagreement). On the contrary, if PS was higher than DS, then DS was simply subtracted from PS. This way, a negative value means that a certain item was given a higher score by the dentist, and a positive value indicates a higher score given by the patient. The value of full agreement is 0 and the value of full disagreement is either −4 or +4. Regardless of the sign, the higher the value, the higher the disagreement. At the level of an item pair, DD was expressed as the mean of all DD values for the given item pair, with SD and 95% CI. Besides DD, for each matched item pair, the percentages of dentist-patient responses in full agreement and full disagreement were also calculated.

3. Results

3.1. The Study Population

77 dentists and 1121 patients completed the questionnaire.

Of the responding dentists, 44 were male (51.9%) and 33 were female (48.1%). Their mean age was 40.57 (±15.23) years (23 to 72 years). By the time of the study, they had spent a mean of 17.60 (±12.16) years in the profession. Their practices were predominantly located in county seats (48 dentists, 62.3%), or other towns (19 dentists, 24.7%), and 10 practices were located in the capital (13.0%).

Among the respondents, 444 were male (39.6%) and 677 were female (60.4%). Their mean age was 43.60 (±13.97) years (18 to 90 years). Most of them lived in either a county seat (394 patients, 35.1%) or a town (425 patients, 37.9%). The rest of the patients lived in the capital (147 patients, 13.1%), in a township (12 patients, 1.1%), or a village (143 patients, 12.8%). Most of the patients had either a high school diploma (559 patients, 49.9%) or a university degree (509 patients, 45.4%). Twenty-two patients (2.0%) had a postgraduate degree (Ph.D.), while in the case of 31 patients (2.8%), finishing elementary studies was the highest level of education. 651 patients (58.1%), had visited their dentist less than 10 times by the time study, and the remaining 470 patients had had more than 10 visits.

The mean age difference between the dentists and their patients was 0.71 (±15.71) years, with a 95% confidence interval (CI) of −0.20 to 1.61 years (the values were negative when the patient was younger). The location of the dental practice and the patient's residence matched in 706 cases (63.0%). The patient and the dentist were of the same gender in 598 cases (53.3%).

3.2. "I Would Recommend My Dentist to Others"—Satisfaction

The mean score of this statement among the patients was 4.92 (±0.31) with a 95% CI of 4.91–4.94. Among the dentists, the corresponding statement scored somewhat lower, 4.53 (±0.55) with a 95% CI of 4.41–4.66.

The results of the linear regression analysis indicated a significant contribution of the independent variables of the regression model to the overall variance of the patients' responses ($F_{(32,1088)} = 27.59$, $p < 0.001$, $R^2 = 0.43$). Seven variables (questionnaire items) were found to significantly predict the score given to this statement. These were as follows: the match between the practice and the patient's residence ($\beta = -0.060$, $p < 0.05$); the dentist expressed interest in the patient's symptoms ($\beta = 0.217$, $p < 0.001$); the patient was content with the frequency of the appointments ($\beta = 0.088$, $p < 0.01$); the patient was content with the quality of the treatment ($\beta = 0.146$, $p < 0.001$); the patient felt that he or she could trust the dentist's decisions about his or her treatment ($\beta = 0.270$, $p < 0.001$); the patient felt that the dentist knew him or her ($\beta = 0.079$, $p < 0.05$); and the patient felt that the dentist knew his or her medical records ($\beta = 0.085$, $p < 0.01$). In the case of 4 of the variables, it was possible to compare the patient's experience and the dentist's opinion on the given aspect of the patient-dentist relationship. The comparison of the mean scores is given in Table 1.

Table 1. Comparison of the responses of the dentists and the patients regarding the significant factors of patient satisfaction. D: dentist questionnaire, P: patient questionnaire; the numbers next to the letters indicate the number of the item in the given questionnaire.

Item Pair		Topic	Dentist Mean (±SD)	Patient Mean (±SD)
D5	P8	The patient trusts the dentist's medical decisions according to the dentist/patient	4.08 (±0.68)	4.91 (±0.33)
D9	P18	The dentist should show/showed interest in the patient's symptoms	4.94 (±0.25)	4.90 (±0.38)
D15	P26	Frequency of appointments important to patient/satisfactory according to patient	3.81 (±0.90)	4.81 (±0.50)
D16	P27	The quality of treatment is important to the patient/satisfactory according to patient	4.70 (±0.59)	4.94 (±0.27)

3.3. "I Am Very Committed to Continuing a Relationship with My Dentist"—Loyalty

The mean score of this statement among the patients was 4.78 (±0.71) with a 95% CI of 4.74–4.82. Among the dentists, the corresponding statement scored slightly lower, 4.45 (±0.62) with a 95% CI of 4.31–4.59.

The results of the linear regression analysis indicated a significant contribution of the independent variables of the regression model to the overall variance of the patients' responses (F (32,1088) = 7.67, $p < 0.001$, $R^2 = 0.16$). Six variables (questionnaire items) were found to significantly predict the score given to this statement. These were as follows: the dentist used clear language when explaining the treatment ($\beta = 0.126$, $p < 0.01$); the dentist explained what was going to happen before starting treatment ($\beta = -0.101$, $p < 0.01$); the patient was content with the frequency of the appointments ($\beta = 0.125$, $p < 0.01$); the dentist offered more than one treatment plans ($\beta = 0.085$, $p < 0.05$); the patient had the subjective feeling that the staff at his or her present dental care provider mattered to him or her ($\beta = 0.098$, $p < 0.01$); and the patient felt that he or she could trust the dentist's decisions about his or her treatment ($\beta = 0.091$, $p < 0.01$). The dentist-patient comparison was possible in the case of 5 items. The comparison of the mean scores is given in Table 2.

Table 2. Comparison of the responses of the dentists and the patients regarding the significant factors of patient loyalty. D: dentist questionnaire, P: patient questionnaire; the numbers next to the letters indicate the number of the item in the given questionnaire.

Item Pair		Topic	Dentist Mean (±SD)	Patient Mean (±SD)
D5	P8	The patient trusts the dentist's medical decisions according to the dentist/patient	4.08 (±0.68)	4.91 (±0.33)
D12	P23	The dentist should use/used clear language when talking about the treatment	4.88 (±0.32)	4.83 (±0.46)
D13	P24	The dentist should explain/explained the procedure before starting	4.66 (±0.50)	4.90 (±0.34)
D15	P26	The frequency of appointments important to the patient/satisfactory according to the patient	3.81 (±0.90)	4.81 (±0.50)
D17	P29	The dentist should offer/offered alternative treatment plan(s)	4.44 (±0.87)	4.57 (±0.80)

3.4. Agreement/Disagreement between the Dentists' and Their Patients' Responses

The highest- and lowest-scoring statements (items) in both groups are summarized in Table 3. In the patient group, the limit of the 25th percentile was 4.42 and the limit of the 75th percentile was 4.9. In the dentist group, the limit of the 25th percentile was 4.05 and the limit of the 75th percentile was 4.77.

Table 3. The highest- and lowest-scoring statements about patient experience according to the patients and their dentists. A higher score indicates a higher level of agreement with the statement. The statements are arranged in descending order by their mean score.

Item No.	Item	Mean Score	
PATIENTS			
27	I am satisfied with the quality of the treatment.	4.94	
11	I would recommend my dentist to others.	4.92	
8	I trust this dentist's judgments about my medical care.	4.91	
20	The dentist explained clearly what the problem was.	4.91	75th percentile
28	I am satisfied with the explanation given by the dentist.	4.91	
18	The dentist was interested when I spoke about my symptoms.	4.90	
24	The dentist told me what s/he was going to do before starting the procedure.	4.90	
7	I have developed a personal relationship with my current dentist	4.27	
9	I'm confident that my dentist knows me.	4.22	
14	I possess good knowledge of health care services.	4.00	25th percentile
19	The dentist was interested in the effects of the problem on my family or private life.	3.91	
13	For me, the costs in time/money/effort to switch dentists are high.	3.59	
15	I am quite experienced in the health care area.	3.47	
DENTISTS			
9	It matters to the patients that their dentist shows interest when they speak about their symptoms.	4.94	
12	It matters to the patients that their dentist uses words that are understandable in talking about their dental care.	4.88	75th percentile
10	It matters to the patients that their dentist explains clearly what the problem is.	4.87	
18	It matters to the patients that their dentist discusses the treatment plan with them.	4.77	
12	It matters to the patients that the dentist encourages them to ask questions about their treatment.	4.05	
13	The duration of an appointment matters to the patients.	4.05	25th percentile
14	The frequency of appointments matters to the patients.	3.81	
15	Most of the patients possess good knowledge of health care services.	3.48	

The results regarding the degree of disagreement are summarized in Table 4. The data in the table have been arranged according to the percentages of full agreement (i.e., when the dentist and the patient attributed the same level of importance to a given issue or found a statement to be true exactly to the same degree). This arrangement was chosen because this index is easy to interpret, and it reflects the general closeness of opinions very well.

The highest percentages of full agreement (>80%) were observed regarding the pairs D9-P26 (The dentist should show/showed interest in the patient's symptoms) and D10-P28 (The dentist should explain/explained the problem with the teeth in an intelligible way). In contrast, the percentages of the full agreement were remarkably low (<30%) for three item pairs: D5-P8 (The patient trusts the dentist's medical decisions according to the dentist/patient), D8-P14 (The patient is informed about healthcare according to the dentist/patient), and D15-P34 (The frequency of visits is important to the patient/satisfactory according to the patient). Relatively high rates of full disagreement were observed in the case of two item pairs: D7-P12 (The patient is strongly committed according to the dentist/patient) and D17-P37 (The dentist should offer/offered alternative treatment plan(s)).

Table 4. Agreement/disagreement between the dentists' and their patients' responses to all matched item pairs arranged in ascending order of full agreement. Results from 1121 matched responses. The numbering of the items follows the convention of Tables 1 and 2. For the calculation of Degree of Disagreement, see the Statistical Analysis section.

Item Pair		Topic	Full Agreement N (%)	Full Dis-agreement N (%)	Degree of Disagreement (Mean)	SD	95% CI Lower Limit	95% CI Upper Limit
D5	P8	The patient trusts the dentist's medical decisions according to the dentist/patient	291 (25.9%)	0 (0%)	0.90	0.80	0.85	0.95
D8	P14	The patient is informed about healthcare according to the dentist/patient	300 (26.7%)	4 (0.4%)	0.48	1.23	0.41	0.55
D15	P34	The frequency of visits is important to the patient/satisfactory according to the patient	305 (27.2%)	0 (0%)	1.03	1.02	0.97	1.09
D14	P33	The duration of visits is important to the patient/satisfactory according to the patient	398 (35.5%)	0 (0%)	0.86	0.86	0.80	0.92
D11	P30	The dentist should encourage/encouraged questions about treatment	407 (36.3%)	0 (0%)	0.59	0.57	0.53	0.66
D6	P11	The patient would recommend the dentist to others according to the dentist/patient	570 (50.8%)	0 (0%)	0.41	0.64	0.37	0.44
D7	P12	The patient is strongly committed according to the dentist/patient	582 (51.9%)	14 (1.2%)	0.24	0.96	0.18	0.29
D17	P37	The dentist should offer/offered alternative treatment plan(s)	590 (52.6%)	17 (1.5%)	0.04	1.11	−0.02	0.11
D19	P39	The dentist and the patient should agree/agreed on the treatment plan	722 (64.3%)	2(0.2%)	0.23	0.66	0.19	0.27
D13	P32	The dentist should explain/explained the procedure before starting	728 (64.9%)	0 (0%)	0.26	0.55	0.23	0.30
D16	P35	The quality of treatment is important to the patient/satisfactory according to the patient	770 (68.6%)	0 (0%)	0.31	0.77	0.27	0.36
D18	P38	The dentist should discuss/discussed treatment plan with the patient	824 (73.4%)	0 (0%)	0.14	0.59	0.11	0.17
D12	P31	The dentist should use/used clear language when talking about the treatment	863 (76.9%)	0 (0%)	−0.06	0.57	−0.09	−0.02
D10	P28	The dentist should explain/explained the problem with the teeth in an intelligible way	935 (83.3%)	1 (0.1%)	0.03	0.47	0.00	0.05
D9	P26	The dentist should show/showed interest in the patient's symptoms	958 (85.4%)	1 (0.1%)	−0.03	0.47	−0.05	0.00

The table shows that, even though the percentages of the full agreement were quite variable, the responses of the patients and dentists were still quite close. The mean disagreement was always below 1 point, except for the pair D15-P34 (The frequency of visits is important to the patient/satisfactory according to the patient), with a mean disagreement of 1.03 points. It is also clear from the table that most of the mean disagreement scores are positive, which indicates that the patients were somewhat more satisfied with the given aspect of patient experience than how important their dentist considered it. The two ex-

ceptions are D9-P26 (The dentist should show/showed interest in the patient's symptoms) and D12-P31 (The duration of visits is important to the patient/satisfactory according to the patient), but the disagreement is marginal.

4. Discussion

In this study, our primary aim was to explore which aspects of the patients' experiences of their dental care influenced their self-perceived satisfaction and loyalty the most. We also sought to compare patients' and dentists' perspectives on a variety of issues related to patient experience and the relationship between the patient and his or her dentist. All our hypotheses have been confirmed: good communication was indeed a major contributor to patient satisfaction and loyalty (with an emphasis on language use and good explanations) and there was generally a high degree of agreement between what the dentists considered important regarding the dental experience and what the patients expected. Yet, there were readily recognizable areas of disagreement.

In advance, it is important to stress that the concepts of satisfaction and loyalty are deeply intertwined, so when in our discussion we say that one factor influenced satisfaction and another one loyalty, it should not be understood exclusively. Rather, one had better understand it in a way that these factors contribute to the patients' positive attitudes toward the dentist, expressed both as satisfaction and loyalty. The aim of this study was to get to know the patients' and their dentist's perspectives rather than to map all the complex relationships between the explanatory variables. Furthermore, it is important to stress that the model fit of our regression models is limited. This means there is a considerable amount of unexplained variance. In other words, this study identifies only a small portion of the factors that determine patient satisfaction and loyalty.

Studies from all over the world have dealt with patient satisfaction and loyalty, especially in connection with the field of general medicine [1,12,13,16], but a few dentistry-specific studies are also available [17–20,41]. To support our analysis of the results, we will be drawing upon these studies.

Our results are in line with the literature in at least two very important respects. The first one is the role of the trust [12,15]. The patients' trust in their dentist's decisions regarding their dental care turned out to be a significant predictor of both satisfaction and loyalty. As mentioned earlier, the two concepts are intertwined, and their exact relationship is a matter of discussion in the literature, especially regarding the role of trust. Platonova and co-workers argued that patient satisfaction bears patient loyalty, but at the same time, they are both significantly influenced by the trust [12]. In contrast, AlOmari and Hamid suggested that repeated satisfactory experience with the care provider builds trust, and the resulting trust leads to loyalty, so satisfaction comes first, and it builds loyalty through the trust [15]. In our opinion, this latter explanation is more plausible, while it cannot be excluded that established trust acts back on satisfaction (i.e., if one trusts one's care provider, one will tend to be more satisfied with the care provider, in a self-fulfilling manner). In our patient population, trust in the dentist was generally high (the third highest-scoring item with a mean of 4.91 points). It is interesting that the dentists tended to underestimate their patients' trust in them (a mean of 4.08 points), so much so that the matched item pair regarding trust turned out to be the one with the lowest percentage of full patient-dentist agreement (25.9%). It seems that the dentists had a somewhat pessimistic view of their patients in this respect, but the data gathered in this study do not allow an explanation. As we have found no other study to describe a similar phenomenon, we believe that this is a population-specific finding. In any way, based on our results, we agree with the literature that to establish patient loyalty, trust must be established first, which is best done by increasing patient satisfaction. What is the best approach to increasing satisfaction, which in turn leads to greater loyalty?

Regardless of the cultural context, it is an unequivocal finding that good communication on the care provider side is a major contributor to patient satisfaction and loyalty. This was found in Malta [18], the USA [20], Saudi Arabia [41], and the UK [19] alike, and

our results from Hungary corroborate that observation. The apparently most important communicative strategy in dentistry in this respect is a thorough yet intelligible description of the procedures (especially directly before starting a procedure). This has an anxiety-reducing effect, which is of great importance in the dentistry [52]. Delivering professional explanations in simple language is also the first step to engage patients and make them partners in their own care, which has been shown to increase satisfaction [53]. The dentist in our sample seems to understand this well: all four highest-scoring items in the dentist group were related to good communication. That is, the dentists considered it especially important to show interest in their patients' symptoms (4.94 points), use language that is easy to understand (4.88 points), explain the (dental) problem clearly (4.87 points), and discuss the treatment plan with their patients (4.77 points). Even more importantly, some of the same items showed up among the highest-scoring items of the patient group. It means that the patients did experience this patient-centered communication during their last visit. The patients reported that their dentist explained the (dental) problem clearly (4.91 points), they were satisfied with the explanation (4.91 points), their dentist showed interest in their symptoms (4.90 points), and their dentist told them what he or she was going to do before starting a specific procedure (4.90 points). In addition, the matched item pairs with the highest percentage of the full dentist-patient agreement were all related to communication/explanation, which means that the dentists did not only consider these issues highly important, but they could also meet their patient's expectations at the same high level. It comes as no surprise that good communication appeared as a significant predictor of both satisfaction and loyalty. The dentist's patient-perceived interest in the patient's symptoms turned out to be a significant predictor of satisfaction, while explanations about one's dental care in an "understandable" language, an explanation about the procedure that the dentist was about to start, and being offered more than one treatment plans had a significant effect on loyalty. Here we must point out again that the concepts of satisfaction and loyalty are intertwined, so these results are best understood as indicating that the named independent variables significantly contributed to a positive patient experience, which is reflected in a higher level of satisfaction and loyalty. All in all, these results corroborate our previous knowledge that it is of utmost importance that the language of the explanations regarding dental conditions and procedures be tailored to the patient and that explanations should be offered before all procedures.

Another question of interest is that of the personal relationship between the dentist and the patient. Little and colleagues [16] emphasized the importance of a personal relationship between the care provider and the patient. Platonova and co-workers also found that a good personal relationship with the care provider is important for patients to feel satisfied with the care provider. Our findings support this indeed: the subjective feeling of the patient that his or her dentist knew him or her contributed significantly to patient satisfaction, while a feeling of attachment and appreciation ("The people where I currently get my dental service matter to me") contributed significantly to loyalty. The interesting finding regarding this is that these items scored low among the patients: three of the six items in the lowest percentile were related to the personal relationship with the dentist. Even if this does not mean that the relationship was perceived as definitely bad or weak (3.91–4.27 points of the five on average, depending on the particular item), these items did not rank even close to the communication items. That is, while the dentists were perceived as excellent communicators by their patients, their relationship with the dentist on a personal level was not seen by patients as a similarly remarkable aspect of the dental experience. We consider this a locally important finding. In Hungary (and probably in the entire post-Soviet bloc of Central Europe) the doctor-patient relationship is still often thought of in quite paternalistic terms [54]: the medical care provider is seen as an authority figure with whom connection at a personal level is inconceivable and whose sole task is to cure the physical ailment, to "fix" the patient, so to speak. In addition, Thompson and co-workers point out that medical paternalism is sometimes culturally accepted and expected [55]. Our experience with Hungarian patient populations is that the patients often think that it is rude to initiate

a personal connection with the provider, while the providers often think that connecting to a patient is unwanted or even ethically risky. There is an awkward cautiousness on both sides, while both the literature and our results suggest that a good personal connection does contribute to the positive experience of the patient. We believe that putting more emphasis on this issue in courses of medical/dental communication and medical ethics (which all medical universities offer now) could be a good way to address this phenomenon in our geographical region.

A related issue is that of the dentist's knowledge of the patient's medical records. This had a significant effect on satisfaction. Of course, this has nothing to do with a dentist-patient relationship on a personal level, this is rather an indicator of professionalism and competence. The related item ("I'm confident that my dentist knows my medical records.") ranked only 17 of 25 (4.65 points), which shows that the patients were not always completely convinced about this. Yet, on the one hand, a mean score of 4.65 of 5 is still quite high, and, on the other hand, this item is questionable in retrospect: unless the dentist makes it known to the patient in some explicit way that he or she knows the patient's medical records, the patient has limited means to know about this, not to mention being confident. Some encounters do necessitate explicit signaling of such knowledge, but others do not. That is, this item measures the patient's impression that is based on limited information. Thus, while we accept that the impression that the dentist knows about one's medical data can foster satisfaction, we are reluctant to conclude that this result shows that the dentists in this sample were not aware of their patient's medical data. All in all, the fact that this item ranked only 17th is probably due to its vague wording.

While it came as no surprise at all that the patient-perceived quality of the treatment had a significant effect on satisfaction, it was an unexpected finding that satisfaction with the frequency of the visits contributed significantly to both satisfaction and loyalty. To our knowledge, no previous study reported this. Lamprecht and colleagues do mention that the appointments should be convenient [42], but they do not mention frequency per se. From the results it seems that the dentists did not expect this result either: this item got the second lowest mean score in the dentist group (3.81 points), which means that the dentists did not consider this something highly important. The patients' responses support this: satisfaction with the frequency of the visits ranked 15th among the patients, and this item was also characterized by the highest degree of patient-dentist disagreement and the third lowest percentage of full agreement (27.2%). Similarly to the findings of Riley III et al. [20], this aspect of dental care was a potential source of dissatisfaction for patients, yet dentists were not fully aware of its importance. While no study before has reported this specific issue, it is intuitive that if the frequency of the visits is tailored to the patient's needs, the patient will be more satisfied. Therefore, we suggest that to increase patient satisfaction and loyalty, dentists should be aware of this phenomenon and put more emphasis on finding the optimal recall schedule for their patients.

Research suggests that female healthcare providers typically engage in longer consultations, provide more information, and express more explicit reassurance and encouragement compared to male clinicians [37,39,56]. In addition, studies have demonstrated that patients tend to adjust their responses based on the gender of their clinician, regardless of their gender [40,57]. Furthermore, the gender composition of the patient-provider relationship may impact overall patient satisfaction [58]. Based on this, we expected that the gender of the patient or the physician or their concordance would have a significant effect on the overall patient experience. Neither the patient's nor the dentist's gender nor the concordance of the two turned out to have a significant effect on either satisfaction or loyalty. It is difficult to give a good explanation for this, especially because the gender effect is reported in several studies from a variety of cultures and healthcare settings. In this respect, our results are not in line with the literature. While it is difficult to give a good explanation, it does not seem far-fetched to assume that the level of the personal connection between the dentist and the patient might play a mediating role here. While, to our knowledge, it has not been explicitly studied before, the results raise the possibility that the level of personal

connection (which was suboptimal in our sample) acts as a permissive factor, and below a given level of personal connection, the effects of gender may not show (or to a much more limited extent). However, we would like to stress once again that this is just an assumption based on the results, we have no data or literary references to support this. At the same time, we consider this an assumption that would be worth testing from the standpoint of psychology.

As for the demographic factors, the single factor that had a significant effect on patient satisfaction was a match between the patient's residence and the location of the dental office. We do not think that this has any special explanation other than that it is more convenient to visit a nearby dental office than one that is further away. Lamprecht and colleagues came to a similar conclusion [42].

Our findings provide support for the positive impact of effective communication, trust, and personalized rapport between patients and dentists on enhancing patient satisfaction and fostering loyalty. Our study has successfully reproduced the effects of well-documented factors, such as using patient-friendly language in professional explanations and the dentist's explicit attention to patient symptoms. These recurring observations, transcending cultural boundaries, can be regarded as valuable guidelines for enhancing the patient experience. Yet, our results also underscore the significance of understanding local patient preferences. Notably, our study is the first to highlight the potential role of recall frequency in shaping the patient experience, suggesting a context-specific insight. This underscores the need to regularly assess patient experiences, solicit feedback on practice strengths and weaknesses, and create avenues for patients to contribute ideas for improvement. A succinct and anonymous patient satisfaction survey placed in a prominently visible location within the waiting room can serve as an effective means to collect such valuable insights.

In terms of future research directions, our study has left several questions unanswered and only scratched the surface in identifying factors that affect patient satisfaction and loyalty. The limited model fit in our regression models suggests that there are other factors at play. This limitation may be due to using questionnaire items that were already studied in the literature, which naturally narrowed down the scope of our research. Exploring patients' own descriptions (through open-ended questions) of what contributes to their satisfaction with their dentist or influences their loyalty could be a productive avenue for further research.

With regards to the study's strengths and limitations, there are several aspects to consider. The large size of the patient sample constitutes a pronounced strength, alongside the comprehensive incorporation of both patient and dentist perspectives. However, it is essential to acknowledge certain limitations. The study's primary objective pertained to the exploration of patient and dentist viewpoints, rather than the establishment of intricate relationships among explanatory variables. While the patient sample is of a substantial size, its lack of representativeness across the broader Hungarian population must be recognized, a limitation further accentuated in the relatively modest dentist sample. Additionally, the sampling process inevitably introduced a measure of self-selection bias. Lastly, it is pertinent to underscore that the model fit of the regression models exhibits limitations, characterized by notable unexplained variance, a factor demanding careful consideration during result interpretation.

5. Conclusions

Most of the results of this study are in line with the published literature: the results corroborate that good communication, trust and a personal relationship between the patient and the dentist promote patient satisfaction and loyalty. We have managed to replicate the effect of widely reported factors like patient-friendly wording of professional explanations or the explicit interest of the dentist in the patient's symptoms. Similarly to other studies, we have found that the perspectives of the dentist and the patient might differ on some key issues. It is important to know about these issues, as they offer points of intervention to improve the patient experience. For instance, optimizing the recall schedule to the

individual patient's needs is not difficult, but it appears that it might have a significant impact. At the same time, the results show that the well-known principles of patient satisfaction and loyalty can be modified by local factors. Therefore, we suggest that it is not enough to know the general principles, but to achieve the best possible outcome, the dentist should always be aware of and consider the preferences of the patient population they attend to.

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A „kompromisszumos választás" szerepe a fogászati kezeléssel kapcsolatos döntések során

676 magyar önkéntes részvételével végzett vizsgálat

Szabó Réka[1] ▪ **Farkas Gergely**[2] ▪ **Keszeg Mária**[2]
Eördegh Gabriella dr.[3] ▪ **Buzás Norbert dr.**[4] ▪ **Antal Márk dr.**[1]

[1]Szegedi Tudományegyetem, Fogorvostudományi Kar, Konzerváló és Esztétikai Fogászati Tanszék, Szeged
[2]Szegedi Tudományegyetem, Gazdaságtudományi Kar, Üzleti Tudományok Intézete, Szeged
[3]Szegedi Tudományegyetem, Fogorvostudományi Kar, Orálbiológiai és Kísérletes Fogorvostudományi Tanszék, Szeged
[4]Szegedi Tudományegyetem, Általános Orvostudományi Kar, Egészség-gazdaságtani Intézet, Szeged

Bevezetés: A kompromisszumos választás („compromise effect") a marketing világában jól ismert, ám egészségügyi vonatkozásban ritkán vizsgált jelenség. Fogászati szempontból a betegeknek sok esetben az egyetlen könnyen értelmezhető információ az ár, ezért kizárólag erre alapozzák döntésüket.
Célkitűzés: A jelen vizsgálat célja annak meghatározása, hogy a kompromisszumos választás szerepet játszik-e a fogászati kezeléssel kapcsolatos döntések meghozatalában, és ha igen, hogyan befolyásolják az olyan tényezők, mint az észlelt minőség, a tájékoztatás során használt szakzsargon vagy a saját fog megőrzésének igénye.
Módszer: A kérdőívalapú vizsgálatot 676 önkéntes részvételével végeztük. A kérdőívek kitöltése anonim módon történt. Ugyanannak a kérdőívnek összesen 8 változatát készítettük el, melyek a következő információkat tartalmazták változó kombinációban: öt különböző fogászati kezelés neve az olcsótól a drágáig, a lehetséges költségek, valamint a kezeléssel kapcsolatos kiegészítő információk. A betegeket megkértük, hogy a kérdőíven jelezzék preferenciáikat.
Statisztikai analízis: A válaszok relatív gyakorisága és a rendelkezésre álló kiegészítő információk közötti összefüggés szignifikanciáját khi-négyzet-próbával és Fisher-féle egzakt próbával határoztuk meg.
Eredmények: A válaszadók alapvetően nem heurisztikus alapon hozták meg kezelésükkel kapcsolatos döntéseiket, aminek oka valószínűleg a fogászati kezeléssel kapcsolatos előítéleteikben és korábbi tapasztalataikban keresendő. A legfontosabb tényezőnek az esztétikum bizonyult, és a várható tartósság is jelentősen befolyásolta a betegek választását.
Következtetés: A kiegészítő információk befolyásolhatják és befolyásolják a betegek fogászati kezeléssel kapcsolatos tájékozott döntéseit, feltéve, hogy az információk átadása világos, megfelelő és érthető formában történik. Mindez a professzionális kommunikáció fontosságát mutatja.
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Kulcsszavak: fogászat, egészség-gazdaságtan, heurisztika, döntésmechanizmus

The role of the "compromise effect" in dental treatment choice

A pilot study in 676 Hungarian volunteers

Introduction: The compromise effect is a well-known phenomenon in the world of marketing, but it is rarely examined in medical settings. In dental setting, the patient often has to make treatment-related decisions with price as the only available and comprehensible information to help informed choice.
Aim: We sought to determine if the compromise effect plays a role in dental treatment choices, and if yes, how the effect is modified by factors such as perceived quality, professional jargon in the explanations, or the importance of keeping one's own teeth intact.
Method: 676 volunteers participated in this questionnaire-based study. The questionnaires were filled in anonymously. Altogether 8 versions of the same questionnaire were generated, in which the following information was given in

varying combinations: the names of five different dental treatments from cheap to expensive, their possible prices, and additional information about the treatment.

Statistical analysis: The significance of the relationship between the relative frequency of responses and the available additional information was determined by chi-square test and Fisher's exact test.

Results: The respondents did not approach dental treatment-related decisions on a heuristic basis by default, most probably because of their preconceptions and previous experiences in connection with dental treatments. Esthetics turned out to be of utmost importance and expectable lifespan was also information that significantly influenced the choices.

Conclusion: Extra 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 points out the importance of professional communication.

Keywords: dentistry, health-economy, heuristic, decision making

Rövidítések

AI = (additional information) kiegészítő információ; PO = (price-only) csak ár; x = alacsony ár; y = közepes ár; z = magas ár

A fogorvostudomány alapvetően ugyan egészségügyi szakma, napjainkban számos egészség-gazdaságtani vetülete is van. A páciensek döntési mechanizmusának ismerete kiemelten fontos, mivel számos alternatív kezelési eljárás áll rendelkezésre, amelyek több szempont szerint különbözhetnek egymástól, így a hatékonyság és a költség mellett sokszor az esztétikum is fontos szerepet játszhat a páciensek döntéshozatalában. Egy fogorvos mindennapjaiban az alkalmazott (és alkalmazható) kezelések közötti választást a szakmai felkészültségen, a rendelkezésre álló technológiákon és eszközökön túl a páciensek döntései is nagymértékben befolyásolják. Sok esetben ugyan több terápiás módszer is számításba jöhet, s ezek előnyeit, kockázatait, illetve a kezelés várható kimeneteleit a fogorvosok képesek felmérni, a páciensek számára ezen információk nem állnak automatikusan rendelkezésre. A páciensek előzetes ismeretei inkább korábbi tapasztalataikon, illetve hiedelmeken alapulnak, így a fogorvos feladata az is, hogy segítse pácienseit a valós információkon, tudáson alapuló döntés meghozatalában. Egy kezelés során a fogorvosnak általában mindössze néhány perc áll rendelkezésére, hogy felmérje a páciens igényeit, ugyanakkor a kezelési lehetőségeket bemutatva általában már döntést is kell hoznia a legmegfelelőbb kezelés vonatkozásában. Bár ehhez a fogorvosin kívül számos egyéb tudományterületen való jártasságra is szükség van, egyelőre sem a kognitív pszichológia, sem a közgazdaságtan oktatása nem képezi szerves részét a fogorvosi képzésnek. Ezzel szemben a páciens számára a választást befolyásolhatják olyan gazdasági és egyéb tényezők, melyek a végleges döntést nagyban meghatározzák.

A döntés a cselekvés alternatívái közötti választás valamilyen cél érdekében. Ideális esetben a döntéshozatal során az ember képes az összes létező alternatívát és lehetséges kimenetelt átlátni és mérlegelni, és ezek alapján céljai érdekében kiválasztani a legmegfelelőbbet. A mindennapokban azonban a döntéshozatal folyamatát több olyan külső tényező is befolyásolja, amelyről a döntéshozónak nincs tudomása [1]. Nagyon sokszor az összes információ, szempont és kimenetel mentális feldolgozása túl nagy energiákat igényelne, ezért az emberek a döntéshozatal során a döntés hatékonyabb és gyorsabb meghozatala érdekében gyakran az ún. heurisztikus stratégiát alkalmazzák. A heurisztika a nehezen megoldható problémák közelítő megoldásának kognitív lerövidítése, azaz tulajdonképpen minden olyan addig jól bevált stratégia vagy tapasztalati szabály, amely bizonyos lépések szisztematikus kihagyásával lerövidíti a megoldáshoz vezető utat egy problémamegoldó folyamat során [2]. Az ilyen technikák lehetővé teszik a döntést olyan helyzetekben is, amikor csupán korlátozott mennyiségű információ áll rendelkezésre.

A kompromisszumos választás olyan heurisztikus technika, mely révén az alternatívák vonzereje és kiválasztási valószínűsége jelentősen nő, ha középutat képviselnek [3]. Más vizsgálatok eredményei alapján ez általában a középső lehetőség választását jelenti, ha van ilyen. Ez a jelenség jól dokumentált a termékmegjelenítés esetében [4, 5], de *Rodway és mtsai* vizsgálata szerint ez a hatás annyira erőteljes, hogy kérdőíven is befolyásolhatja a válaszadást [6].

A kompromisszumos választás bizonyításához feltételezzük, hogy az [a, b, c] lehetőségek két dimenzió mentén leírhatók, és [a] az egyik, [c] a másik dimenzióban domináns. A középső lehetőség, a [b] egyik dimenzióban sem domináns, és a másik két lehetőség egyikéhez sem hasonló. A kompromisszumos választás szerint a [b] jobban preferált, ha [a, b, c] is bemutatásra kerül, ahhoz képest, ha csak [a, b] vagy [b, c] ismert. A kompromisz-

Nem	Gyakoriság (fő)	Arány (%)
Férfi	385	56,9
Nő	291	43,1
Életkor	Gyakoriság (fő)	Arány (%)
18–20 év	178	26,57
21–30 év	239	35,67
31–40 év	103	15,37
41–50 év	100	14,93
50+ év	50	7,46
Iskolai végzettség	Gyakoriság (fő)	Arány (%)
Általános iskola	78	11,5
Középiskola	444	65,6
Felsőoktatás	145	21,1

A nem reprezentatív mintában (n = 676) a teljes magyar populációhoz viszonyítva a férfiak 3,5 százalékpontos alulreprezentáltsága volt megfigyelhető, míg a magas iskolázottságú személyek 2 százalékponttal felülreprezentáltak voltak. A legmagasabb iskolai végzettség tekintetében a mintában az érettségizett résztvevők voltak túlsúlyban (65,6%).

szumos választás a racionális választás erőteljes megsértése, és amint várható, minél több információ áll rendelkezésre, annál kevésbé valószínű heurisztikus döntéshozatal [7].

A mindennapi életben használt termékek esetében számos különböző forrásból származó információ áll rendelkezésre. A fogászat ugyanakkor erősen specializálódott terület. Még ha a fogorvos megfelelő tájékoztatást nyújt is, az információk laikusok számára is érthető módon történő átadása gyakran nehézkes. Előfordulhat, hogy a beteg számára csak a heurisztikus technika marad a döntés meghozásához, ami később nemkívánatos következményekkel járhat (például nem a várt tartósság, esztétikai megjelenés vagy ár, esetleg figyelmen kívül hagyott kellemetlenségek).

A jelen vizsgálat célja annak meghatározása, hogy a kompromisszumos választás megjelenik-e a fogászati kezeléssel kapcsolatos döntéshozatal során, és ha igen, hogyan befolyásolják azt az esetleges kiegészítő információk.

Módszer

A vizsgálatban 676 önkéntes vett részt. A demográfiai jellemzőket az *1. táblázatban* ismertetjük. Az önkéntesek mindegyike a Szegedi Tudományegyetem Fogorvostudományi Karának betege volt. A résztvevők számát az egyéves időszak alatt rendelkezésre álló önkéntesek maximális számában határoztuk meg. Az adatok feldolgozása és az eredmények értékelése 2017-ben történt.

A vizsgálati terv összhangban volt a helsinki nyilatkozattal, jóváhagyását a Szegedi Tudományegyetem Inté-

zeti Kutatásetikai Bizottsága végezte. A részvétel a beleegyező nyilatkozat aláírását követően önkéntes volt.

A betegek választási szokásait saját tervezésű anonim kérdőív segítségével vizsgáltuk. Ugyanannak a kérdőívnek összesen 8 változatát készítettük el, melyek az alábbi információkat tartalmazták változó kombinációban: öt különböző fogászati kezelés neve (melyek árban is különböztek egymástól) és lehetséges költségeik, valamint a kezeléssel kapcsolatos kiegészítő információk. A kiegészítő információk kategóriáit a szakirodalom alapján határoztuk meg [8–13]. A kezelések neve és ára (a továbbiakban: price-only, PO) mind a nyolc változatban megjelent, míg a kiegészítő információkat (additional information, AI) csak négy kérdőív tartalmazta. Az egyes elemeket [x, y, z], [x, y], [y, z] vagy [x, z] kombinációban mutattuk be, ahol [x] az olcsó, [y] a közepes árú, [z] a drága lehetőséget jelölte. Az árakat a magyarországi

Kezelés	Ár	Kiegészítő információk	1.	2.	3.	4.
Gyökérkezelés	20 euró	Single-point[a]	x	x		x
	40 euró	Laterálkondenzációs	x	x	x	
	60 euró	Thermafil	x		x	x
Szuvasodás gyulladás nélkül	30 euró	Tömés (2–4 év élettartam)[b]	x	x		x
	60 euró	Kompozit inlay (6–8 év élettartam)	x	x	x	
	90 euró	Kerámia inlay (10–12 év élettartam)	x		x	x
Gyulladt fog kezelése	40 euró	Fogmegtartás töméssel[c]	x	x		x
	80 euró	Korona készítése	x	x	x	
	120 euró	Híd készítése	x		x	x
Korona	85 euró	Hagyományos[d]	x	x		x
	170 euró	Modern	x	x	x	
	255 euró	Innovatív	x		x	x
Műfogsor	104 euró	Jól látható kapcsok[e]	x	x		x
	208 euró	Alig látható kapcsok	x	x	x	
	312 euró	Láthatatlan kapcsok	x		x	x

A kérdőív minden verziójában felsoroltunk minden kezeléstípust különböző, rendelkezésre álló lehetőségekkel (x, y, z; x, y; y, z; x, z), kiegészítő információkkal vagy kiegészítő információk nélkül. A felső indexben található betűk a kiegészítő információk kategóriáit jelzik a következők szerint: a) szakkifejezés; b) tartósság; c) a fogmegőrzés lehetősége; d) modernitás; e) esztétikum. Az 1–4. számok a kérdőív verzióját jelölik. Az 1. kérdőívben az ár vonatkozásában minden esetben három (alacsony-közepes-magas), a 2. kérdőívben kettő (alacsony-közepes), a 3. kérdőívben kettő (közepes-magas), a 4. kérdőívben szintén kettő (alacsony-magas) választási lehetőséget adtunk. E lehetőségek megegyeztek a „csak ár" (PO-) és a kiegészítő információt tartalmazó (AI-) verzióban. A nemzetközi összehasonlíthatóság érdekében az árakat euróban tüntettük fel (a kérdőíveken magyar forint szerepelt). A vizsgálat készítésekor 1 euró 308 magyar forintnak felelt meg.

piaci ár figyelembevételével határoztuk meg oly módon, hogy a közepes ár a kétszerese, a magas ár a háromszorosa volt az alacsony árnak. A kérdőív minden változatát 84–102 résztvevő töltötte ki. A beavatkozások összefoglalását a *2. táblázat* tartalmazza.

A PO-elrendezésekkel kapcsolatos hipotézisünk az volt, hogy a kompromisszumos választás minden árkategóriában megfigyelhető. Feltételeztük továbbá, hogy a kiegészítő információk ezt elrendezés- és árkategóriafüggő módon befolyásolják.

A statisztikai elemzéseket SPSS 21.0 szoftverrel végeztük (IBM, Armonk, NY, USA). Kiszámítottuk a választások relatív gyakoriságát. A gyakoriságok és a rendelkezésre álló kiegészítő információk közötti összefüggés szignifikanciáját khi-négyzet-próbával és Fisher-féle egzakt próbával határoztuk meg.

Eredmények

Az eredmények összefoglalását a *3. és 4. táblázat* tartalmazza. A pontos kezeléseket és a kiegészítő információkat a *2. táblázatban* ismertettük. A százalékos értékek az adott eszközt választó betegek arányát jelzik.

A legalacsonyabb árkategóriájú kezelés esetén és az [x, y, z] PO-elrendezésben (N = 100)[1] [x] volt a domináns választás (42%); az [y]-t a válaszadók 37%-a, a [z]-t 21%-a választotta. Kiegészítő információ birtokában az [x] választási gyakorisága változatlan maradt (42%), ugyanakkor a [z]-t választók aránya 11%-ra esett vissza, míg az [y] lehetőséget választók aránya 10 százalékponttal nőtt (47%-ra). Két lehetőség esetén[2] a kiegészítő információknak nem volt valós hatásuk: [x, y] PO-elrendezésben [x] volt a domináns választás (54%), mely kiegészítő információ hatására 51%-ra csökkent. Az [y, z] PO-elrendezésben [y] volt a domináns választás (61%), mely kiegészítő információ hatására 58%-ra módosult. Az [x, z] PO-elrendezésben (N = 92) [x] volt a domináns választás (64%), mely kiegészítő információ hatására 53%-ra változott (N = 70). Így elmondható, hogy az [y] lehetőség preferenciája csak az [x, y, z] AI-elrendezésben volt megfigyelhető, de a khi-négyzet-próba még ebben az esetben sem igazolt szignifikáns összefüggést a betegek választása és az információ elérhetősége között.

Egy árkategóriával magasabb kezeléstípus esetén az [x, y, z] PO-elrendezésben az [x] lehetőséget a válaszadók 53%-a, az [y] lehetőséget 27%-a, a [z] lehetőséget 20%-a választotta. Ezt a kiegészítő információ a következőképpen módosította: az [x] lehetőséget 33%, az [y]-t 45%, a [z]-t 22% részesítette előnyben. A khi-négyzet-próba szignifikáns összefüggést igazolt a betegek választása és az információ elérhetősége között (χ^2 = 9,25, 2, p<0,05). Két lehetőség esetén hasonló hatás volt megfigyelhető.

[1] Az egyes alcsoportok résztvevőinek számát csak az első árkategória leírásában adjuk meg, mivel az alcsoportok minden esetben azonosak voltak.
[2] [x, y]: N_{PO} = 80, N_{AI} = 77; [y, z]: N_{PO} = 74, N_{AI} = 83 vagy [x, z]: N_{PO} = 92, N_{AI} = 70.

3. táblázat | A közepes árú (kompromisszumos) lehetőség választási gyakorisága „csak ár" (PO), illetve kiegészítő információk (AI) birtokában három különböző ár kombinációjában

Ár (euró)/kiegészítő információ	PO	AI	PO	AI	PO	AI
	(x, y, z)		(x, y)		(y, z)	
1. 20–40–60 / TT	37,3%	47,0%	46,2%	48,1%	60,8%	57,8%
2. 30–60–90 / LS	27,5%	45,0%	21,8%	46,8%	47,9%	62,7%
3. 40–80–120 / OT	36,3%	40,0%	25,6%	42,9%	57,4%	68,7%
4. 85–170–255 / MO	43,1%	55,0%	29,9%	48,1%	54,3%	71,7%
5. 104–208–312 / ES	45,1%	28,0%	42,3%	72,7%	36,2%	41,0%

A sorszámok növekvő sorrendben jelzik az árkategóriákat.
AI = kiegészítő információk; PO = csak ár; x = alacsony ár; y = közepes ár; z = magas ár
Kiegészítő információ:
ES = esztétikumra vonatkozó információ (lásd a *2. táblázatot* is); LS = várható élettartam; MO = az adott módszer modernitására vonatkozó információ; OT = a saját fog megtartásának lehetősége tömessel; TT = szakkifejezés

Ez a táblázat csak a közepes árú lehetőségre vonatkozó adatokat tartalmazza. A többi lehetőségre vonatkozó adatokat a szövegben közöltük.

4. táblázat | A különböző árkategóriájú kérdőívek esetén az adott válaszok százalékos megoszlása kérdéscsoportonként

	N_{PO} = 100 N_{AI} = 100			N_{PO} = 80 N_{AI} = 77		N_{PO} = 74 N_{AI} = 83		N_{PO} = 92 N_{AI} = 70	
	x	y	z	x	y	y	z	x	z
1(PO)	42	37	21	54	46	61	39	64	36
1(AI)	42	47	11	51	49	58	42	53	47
2(PO)	53	27	20	79	21	48	52	66	34
2(AI)	33	45	22	53	47	63	37	51	49
3(PO)	52	36	12	75	25	58	42	72	28
3(AI)	50	40	10	57	43	69	31	64	36
4(PO)	32	43	25	70	30	51	49	71	29
4(AI)	34	55	11	48	52	71	29	57	43
5(PO)	15	45	40	54	46	61	39	55	45
5(AI)	11	28	61	27	73	41	59	34	66

A táblázat a kérdőív verzióinak (melynek pontos összetételét a *2. táblázat* tartalmazza) egyre növekvő árkategóriájú kérdéseit párokban sorba rendezve mutatja be, egymás alá helyezve az azonos árkategórián (1–5) belül a „csak ár" (PO) típusú, illetve a kiegészítő információt (AI) tartalmazó kérdésekre adott válaszok százalékos megoszlását. Az egyes kérdőíveket kitöltők számát (N) a legfelső sor mutatja.

Az [x, y] PO-elrendezésben az [x]-et a válaszadók 79%-a, az [y]-t a válaszadók 21%-a választotta; kiegészítő információ birtokában ez az [x] esetében 53%-ra, az [y] esetében 47%-ra módosult. A Fisher-féle egzakt próba szignifikáns összefüggést jelzett az információ elérhetőségével (p<0,01) kapcsolatban. Az [y, z] PO-elrendezésben az [y] lehetőséget a válaszadók 48%-a, a [z] lehetőséget a válaszadók 52%-a választotta. Kiegészítő információ

birtokában az [y] választási gyakorisága 63%-ra, a [z] választási gyakorisága 37%-ra változott. A Fisher-féle egzakt próba szignifikáns összefüggést igazolt az információ elérhetőségével (p<0,05). Végezetül, az [x, z] PO-elrendezésben az [x] (66%) előnye volt megfigyelhető a [z]-vel szemben (34%), míg kiegészítő információ hozzáadása esetén az [x] 51%, a [z] 49% volt. Ebben az esetben szignifikáns összefüggés nem volt megfigyelhető. Ebben az árkategóriában a kiegészítő információ hatására a választás minden esetben a középső lehetőség felé tolódott.

A harmadik árkategóriájú kezelésnél [x, y, z] PO-elrendezés esetén az [x]-et a válaszadók 52%-a, az [y]-t 36%-a, a [z]-t 12%-a választotta. Majdnem ugyanilyen eredményeket kaptunk az [x, y, z] AI-elrendezésben, ahol az [x] gyakorisága 50%, az [y] gyakorisága 40%, a [z] gyakorisága 10% volt. Az [x, y] PO-összehasonlításban az [x] (75%) előnyét figyeltük meg az [y]-nal (25%) szemben. Kiegészítő információ birtokában a választások gyakorisága kiegyensúlyozottabb volt: az [x] választási gyakorisága 57%-ra, az [y] választási gyakorisága 43%-ra változott. Ebben az árkategóriában kizárólag itt mutatkozott szignifikáns összefüggés az információ elérhetőségével (p<0,05, Fisher-féle egzakt próba). Az [y, z] PO-elrendezésben az [y] (58%) népszerűbbnek bizonyult a [z]-nél (42%). Az [y] preferenciája még kifejezettebb volt (69%) az [y, z] AI-elrendezésben. Végezetül, az [x, z] összehasonlításban a PO- és az AI-elrendezésben is [x] volt az előnyben részesített lehetőség (72%, illetve 64%).

A negyedik árkategóriában a kompromisszumos választás egyértelmű volt az [x, y, z] PO-elrendezésben: [x]: 32%, [y]: 43%, [z]: 25%. Kiegészítő információ birtokában ugyanilyen mintázat volt megfigyelhető: [x]: 34%, [y]: 55%, [z]: 11%. A kiegészítő információ elérhetőségével való összefüggés szignifikáns volt (χ^2 = 7,12, 2, p<0,05). Az [x, y] PO-elrendezésben [x] volt a leggyakoribb választás (70%). A kiegészítő információ az egyensúlyt az [y] irányába tolta el (52%, p<0,05, Fisher-féle egzakt próba). Az [y, z] PO-elrendezésben az [y] valamivel gyakoribb választás volt (51%). Kiegészítő információ birtokában jelentős változás mutatkozott: az [y]-t a válaszadók 71%-a, a [z]-t 29%-a választotta (p<0,05, Fisher-féle egzakt próba). Az [x, z] párosítás nagyon hasonló mintázatot mutatott: az [x] előnyét láthattuk kiegészítő információ birtokában és hiányában is (71%, illetve 57%). Ebben az esetben az összefüggés nem volt szignifikáns.

A legmagasabb árkategóriájú kezelések közötti választás jelentősen eltért a többitől. Az [x, y, z] PO-elrendezésben az [x]-et 15%, az [y]-t 45%, a [z]-t 40% választotta. Ez azt jelenti, hogy a magasabb ár ellenére az alacsony árú lehetőséget csupán a válaszadók 15%-a választotta. Még érdekesebb, hogy kiegészítő információ birtokában a betegek az [x]-et és az [y]-t 4, illetve 17%-kal kisebb gyakorisággal, míg a [z]-t gyakrabban (61%) választották. A kiegészítő információ elérhetőségével való össze-

függés szignifikáns volt (χ^2 = 8,94, 2, p<0,05). Majdnem ugyanezt figyeltük meg az [x, y] és [y, z] elrendezések esetében. Kiegészítő információ hiányában az [x, y] elrendezésben az [x]-et a válaszadók 54%-a, az [y]-t 46%-a választotta. Az [y, z] elrendezés esetében az [y]-t a válaszadók 61%-a, a [z]-t 39%-a preferálta. Ez azt jelenti, hogy a betegek mindkét esetben gyakrabban választották az olcsóbb lehetőséget. Ugyanakkor, kiegészítő információ birtokában elmozdulás látszott a drágább lehetőség irányába ([x] *versus* [y]: 27% *versus* 73%; [z] *versus* [y]: 59% *versus* 41%). A kiegészítő információ elérhetőségével való összefüggés csak az előbbi esetben volt szignifikáns (p<0,001, Fisher-féle egzakt próba). Végezetül, az [x, z] PO-elrendezésben az [x] kissé dominánsabb volt (55%), de az [x, z] AI-elrendezés eredményei ettől meglehetősen eltértek: az [x]-et a válaszadók csupán 34%-a választotta, így [z] vált a domináns választássá (66%). Az összefüggés szignifikánsnak bizonyult (p<0,05, Fisher-féle egzakt próba).

Megbeszélés

A „csak ár" (PO-) elrendezésekkel kapcsolatos hipotézisünk az volt, hogy a kompromisszumos választás minden árkategóriában megfigyelhető. Ez a hipotézis csak részben volt helyes. Feltételeztük továbbá, hogy a kiegészítő információk ezt elrendezés- és árkategória-függő módon befolyásolják. Ezt az eredmények alátámasztották. Általánosságban elmondható, hogy az eredmények alapján a vizsgált populáció nem alkalmazta a kompromisszumos heurisztikus technikát.

Az első árkategóriában kiegészítő információ hiányában mindig az alacsony (alacsonyabb) árat részesítették előnyben. A fogyasztók az árat gyakran a minőség jeleként értékelik [14], de ez a jelen esetben nem így történt. A válaszadók valószínűleg egyszerűen a legolcsóbb lehetőséget választották. Kiegészítő információ ismeretében 10%-kal kevesebb válaszadó választotta a drága lehetőséget, mely ugyanennyivel növelte a középső lehetőség választási gyakoriságát. Ez alátámasztja azt a korábbi megfigyelést, hogy a szakkifejezéseknek nincs információs értékük a laikusok számára.

A második árkategóriában a „csak ár" elrendezésben a válaszadók szintén az alacsony (alacsonyabb) árat részesítették előnyben. A kiegészítő információ (hosszabb élettartam) ismeretében más mintázat volt megfigyelhető: az olcsó lehetőséget 20%-kal kevesebben választották, a drága lehetőséget 2%-kal többen (a középső lehetőség lett a legnépszerűbb). Véleményünk szerint ez valódi tájékozott kompromisszumos választás. Úgy tűnik, hogy a hosszabb élettartam olyan információ, mely megkönnyíti a tájékozott választást, valószínűleg azért, mert valós költség-haszon értékelést tesz lehetővé.

A harmadik árkategóriában a kiegészítő információ erőteljes hatását vártuk, mivel szakirodalmi adatok arra engednek következtetni, hogy a saját fog megőrzése fontos kérdés a betegek számára [9, 10]. Ez azonban nem

volt megfigyelhető ebben a mintában. A „csak ár" választási lehetőségek esetében a szokásos mintázatot láttuk (a betegek az alacsonyabb árat részesítették előnyben), és a választás mintázata a kiegészítő információ ismeretében is majdnem változatlan maradt. Lehetséges, hogy ennek oka kulturális különbségekben keresendő, mivel a fentebb említett vizsgálatokat kultúrájukban egymástól eltérő országokban végezték. Az is előfordulhat, hogy a válaszadók nem érezték magukat kompetensnek a kezelés módjával kapcsolatos döntések meghozatalában. Magyarországon a közelmúltig erőteljes paternalista modell volt jellemző az orvos–beteg, fogorvos–beteg kapcsolatra [15]. Bár ez sokat változott, még most is erősen tartja magát az az attitűd, hogy minden döntést az orvosnak kell meghoznia, akár a beteg tájékoztatása nélkül.

A negyedik árkategóriában a kompromisszumos választás már akkor nyilvánvaló volt, amikor még csak az árak voltak ismertek a betegek számára. A kezelés modernségére vonatkozó információ hozzáadása után a középső árkategóriájú lehetőség választási gyakorisága még jobban megerősödött. Ennek lehetséges magyarázata, hogy a válaszadók nem pontosan tudták a különbséget modern és innovatív között, ami összezavarhatta őket. Néhány válaszadó szemében az „innovatív" inkább azt jelenti, hogy kevés a tapasztalat az adott módszerrel, ami miatt az kevéssé tűnik biztonságosnak.

Az ötödik árkategória eredményei a legérdekesebbek. A három választási lehetőséget tartalmazó, „csak ár" elrendezésben a válaszadók 85%-a választotta a két drágább lehetőséget. A középső lehetőség volt a domináns, de csupán 5%-kal. Még érdekesebb, hogy a magas-közepes párosításban a válaszadók 63%-a választotta a drágább lehetőséget. Kiegészítő információ hatására – amely a jelen esetben az esztétikum volt – a drága lehetőség jelentősen dominánssá vált (61%) a három választási lehetőséget tartalmazó elrendezésben. Ez a mintázat a többi kategóriában nem volt megfigyelhető. Véleményünk szerint ez arra utal, hogy a legdrágább kategóriában a válaszadók fontosabbnak találták az esztétikai szempontokat, mint az árat.

Az eredmények alapján, a vizsgálat alább tárgyalt korlátainak figyelembevételével megállapítottuk, hogy a betegek fogászati kezeléssel kapcsolatos döntését alapvetően nem a kompromisszumos választási heurisztika határozza meg még abban az esetben sem, ha a kezelés nevén és a különféle lehetőségek árán kívül nem áll rendelkezésre más információ. Ennek oka, hogy bár a beteg a vizsgált helyzetben fogyasztóként szerepel, fogászati/egészségügyi döntése különbözik mindennapi fogyasztói döntéseitől. Ez úgynevezett korlátozott döntési helyzet [16]. Ebben az esetben nem csupán a termék vagy szolgáltatás minőségéről van szó, hanem végső soron a beteg egészségi állapotáról és egészséggel kapcsolatos életminőségéről.

Segítették a válaszadókat tájékozott döntésük meghozatalában a kiegészítő információk? Ez semmiképpen sem

mondható el a szakkifejezésekről. Ez megerősíti azt az ajánlást, hogy a szakkifejezések használata kerülendő az orvos–beteg kommunikációban, aminek fontosságát a hatékony kommunikáció érdekében nem lehet eléggé hangsúlyozni. Ugyanakkor fontos megállapítás, hogy a várható tartósság a tájékozott döntéshozatalt nagymértékben befolyásoló információ. A minimális invazivitás nem tűnik fontos tényezőnek, de ezt a megállapítást, ahogy említettük, körültekintően kell értelmezni. A tervezett beavatkozás újszerűségének nem elég konkrét meghatározása sem segítette a tájékozott döntéshozatalt. Az esztétikum volt az egyetlen kiegészítő információ, mely erőteljesen befolyásolta a betegek választását. Ez önmagában nem meglepő, de némileg váratlan volt az az erőteljes hatás, mely miatt a válaszadók a legmagasabb árkategóriában a legdrágább lehetőséget választották.

Általánosságban mit jelentenek ezek az eredmények? Először is, a betegek alapvetően nem teljesen heurisztikus alapon döntenek fogászati kezelésükről. Valószínűleg előítéleteik vannak a fogászati kezelésekkel kapcsolatban, és az ár az egyik legfontosabb tényező, amelyet figyelembe vesznek. A kiegészítő információk szerepe nemcsak az, hogy segítik a beteget a heurisztikus döntéshozatal elkerülésében, hanem gazdagítják a döntések hátterét is. Az esztétikum a legfontosabb tényező, és a tartósság is olyan információ, melyet a betegek hatékonyan használhatnak fel. E két tényező laikusok által is könnyen értelmezhető. Ezzel szemben a szakkifejezések nem segítenek, mint ahogyan az újszerűséggel és invazivitással kapcsolatos információk sem. Itt megjegyeznénk, hogy a két utóbbi részletesebb ismeretek meglétét feltételezi. Általánosságban tehát elmondható, hogy a kiegészítő információk befolyásolják a betegek kezeléssel kapcsolatos döntéseit, de csak abban az esetben, ha értelmezésük nem igényel szakmai ismereteket.

Vizsgálatunk korlátjaként fontos kiemelnünk, hogy ebben a témában nagyon kevés szakirodalom áll rendelkezésre. Emiatt ez a vizsgálat próbavizsgálatnak tekinthető, ezért csupán leíró jellegű, melynek célja nem az egyértelmű következtetések levonása, hanem egy eszmecsere elindítása. A vizsgálat másik korlátja, hogy nem valós választási helyzeteket elemeztünk. Egy kérdőív kitöltése közel sem olyan kockázatos, mint tényleges döntést hozni az egyén saját kezeléséről. Végezetül, a magasabb iskolai végzettségű válaszadók túlreprezentáltak voltak a mintában. A korlátoktól függetlenül az eredmények azt mutatják, hogy a kiegészítő információk befolyásolhatják és befolyásolják a betegek fogászati kezeléssel kapcsolatos tájékozott döntéseit, feltéve, hogy az információk átadása világos, megfelelő és érthető formában történik.

tésben és a kérdőív kidolgozásában, A. M. a koncepció kidolgozásában, E. G. a végleges forma kialakításában, B. N. a közlemény struktúrájának kidolgozásában vállalt szerepet. F. G. és K. M. a kérdőívek véglegesítését, szerkesztését, kitöltését és az adatok elemzését végezte. A cikk végleges változatát valamennyi szerző elolvasta és jóváhagyta.

Érdekeltség: A szerzőknek nincsenek érdekeltségeik.

Köszönetnyilvánítás

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(Szabó Réka,
Szeged, Tisza Lajos krt. 64–66., 6720
e-mail: szaboreka@hotmail.com)

„Ubi pus, ibi evacua!"
(Ahol genny van, ott ürítsd ki!)

Introducing career skills for dental students as an undergraduate course at the University of Szeged, Hungary

Réka Magdolna Szabó[1], Joan Mary Davis[2] and Márk Antal[3]*

Abstract

Background: In the last three decades there is a growing recognition in the dental profession that dental education must go beyond teaching the technicalities of dentistry and include professionalism and communication skills that the future dentist may need. Such skills are best taught in a student-centered way. Literature suggests that student-centered elements are difficult to introduce in traditional, teacher-centered curricula. This is especially true in post-communist countries where higher education was under strict state control for decades. The aim of the piece of research presented here was to investigate how difficult it is to introduce a student-centered career skills course in a traditionally teacher-centered dental curriculum.

Methods: Considering the needs of our final-year dental students and Super's model of career development, we created an undergraduate curricular career skills course running for two semesters in two languages (Hungarian and English). The primary aim of the course is to help students with their career expectations and develop their identity as a professional workforce. The secondary aim is to teach skills that students can use when applying for a job. At the end of the semesters, we assessed our students' satisfaction with various aspects of the course by using a questionnaire. Results were analyzed item-wise and according to the main aspects of the course (i.e., groups of items organized around a particular aspect).

Results: General satisfaction with the course was high, and practical skills training (such as CV and motivation letter writing) got the highest scores. From the answers it appears that the students were the least comfortable with having to deal with their personal values and preferences.

Conclusions: While it is common for universities to offer various forms of career intervention, to our knowledge, no other university offers a curricular career skills course specifically for dental students. Our student-centered course designed in a problem-based learning framework worked even in a traditionally teacher-centered educational environment, where university students are rarely encouraged to be active participants in courses. By sharing our experience, we would like to encourage our fellow dental educators working in similar environments to devise and offer such courses.

Keywords: Dentistry, Career development, Problem-based learning, Curriculum

* Correspondence: antal.mark@stoma.szote.u-szeged.hu
[3]Department of Esthetic and Operative Dentistry, University of Szeged,
Faculty of Dentistry, Tisza Lajos körút 64, Szeged 6720, Hungary
Full list of author information is available at the end of the article

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Background

The undergraduate dental curriculum "should prepare graduates to enter practice" [1]. What it means depends on what is considered practice-related by a given curriculum. Literature and most importantly experience tell us, though, that dentistry is a particularly demanding profession that requires a wide range of non-clinical skills. As Myers and Myers summarized, 'It's difficult being a dentist' [2]. This is partly because of the plethora of health hazards [3–7], but also because of the difficulties in balancing work and family [8] and the fact that dentists need to be competent also in non-medical aspects of their practice, such as financial planning, addressing legal issues, personal time management, or practice organization. Studies have found that both dentists and dental students tend to find such practical matters challenging [9]. It should come as no surprise that dentists are exposed to high levels of stress, and none of the specialties seems to be an exception [10]. Constant stress paves the way for alcohol problems [11], burnout [12], and, in the most severe cases, suicide [13]. Accordingly, dental schools around the world have started to address these issues in their curricula. Dealing with the non-strictly professional challenges of dentistry, however, requires certain 'soft' skills (e.g. communication, knowledge of one's self, etc.) that cannot be taught in a teacher-centered framework.

Introduction of a student-centered approach, however, can be difficult. Resistance to change in higher education is a well-known phenomenon [14], toward which both faculty and students contribute. Analyzing the reasons on the faculty side, Brickner differentiated between first-order and second-order barriers to change [15]. The former category includes extrinsic factors, such as insufficient time to plan instruction or inadequate support, and the latter includes intrinsic ones, like beliefs about teaching and learning, strong adherence to established classroom practices or, simply, unwillingness to change [16, 17]. Students, on the other hand, are often socialized to be and used to being passive recipients of academic information [18]. Jain et al. [19] point out that 'teaching in most Asian countries is still dominated by teacher-centered classrooms, in which students passively receive information from the teacher and internalize it through memorization'. The authors add that while such students may find an active role uncomfortable, they often find the passive way of learning unsatisfactory. In summary, the wish for change may well be present together with resistance to it.

Several dental curricula, however, still prepare graduates predominantly in the technical sense, while crucial aspects of dentistry as a job are paid only cursory attention. Cerych, summarizing the situation right after the fall of the Soviet Union, pointed out that the rigid centralization and almost total political control of higher education turned resistance to change into the normal state of affairs in the occupied Central European countries. As the author laconically remarks, "…the majority of people in higher education in Central Europe do not know how to do things differently. They are naturally aware of, and even adhere to, general concepts such as university autonomy or freedom of teaching, but too often these are merely postulates without practical consequences. Worse, they may be postulates leading to problematic simplifications […] a new curriculum meaning just getting rid of the ideological constraints, without moving toward new structures of knowledge." Then he goes on to cite a Czechoslovak specialist: "One of the greatest problems is that the majority of teachers are not interested in curriculum change" [14]. Almost 30 years after the democratic turn, the situation looks quite similar, at least in Hungary. What conserved this attitude of resistance and the old structures as a consequence is a complex issue, the discussion of which is clearly beyond the scope of this paper. Still, its pervasive presence is a fact. At the same time, the literature of medical education and international experience suggest that the introduction of student-centered elements is imperative to enhance the quality of dental education [20–22].

What we present here is a curricular career intervention course for senior (5th -year) students that we introduced into the undergraduate dental curriculum at the Faculty of Dentistry, University of Szeged, Hungary in the academic year 2017/2018. The course was approved by the Faculty Council (Decision No. 4/2017 (2017.01.31.)).

Given the described educational atmosphere, we initially assessed our students' opinion about this more student-centered way of teaching and the contents of the course with the help of a questionnaire (see below). Our hypothesis was that the course would be generally welcome by students, and the practical aspects of it would be the most popular. We also hypothesized that other aspects, especially having to talk about one's strengths and weaknesses, would be less appreciated, as they are unusual for a university course and generally alien from the educational culture our students were socialized in.

The educational context

In Hungary, dentistry is a 10-semester master's program. The four universities that offer dentistry (Budapest, Szeged, Debrecen, and Pécs) have different curricula, but these are all organized around the same main phases or modules: foundations (basic medical sciences and social sciences related to medicine, such as ethics and medical psychology), preclinical studies (laboratory work and the basics of the most frequent dental interventions), and clinical studies (treatment of patients under supervision).

Students obtain their DMD degree after the successful completion of written and oral state board examination. At this point, they are also immediately licensed and registered as general dental practitioners by the National Public Health and Medical Officer Service. Thus, it is possible for the newly graduated dentist to start practice immediately. Those who wish to keep their right to practice must participate in continuing education. Other options include specialty training (3–4 years at university clinics or licensed private practices), PhD studies (4 years), or any job that requires a dental degree. The path to a career in dental education usually starts with specialty training and typically continues with PhD studies, as a PhD in clinical medicine is a requirement for promotion beyond assistant professor. Dental educators in the clinical studies stage of the undergraduate curriculum are always practicing dentists.

Career counseling or support is not part of the curriculum at any level. Such activities are mostly organized in an extracurricular fashion. The University of Szeged, for instance, has a Career Office, which organizes job fairs and provides an online advertising surface for firms offering jobs, but - unfortunately - career counseling is not part of the office's portfolio. Furthermore, this service has no profession-specific elements, so the specific needs of dental students are not addressed at all.

It was in this context that we designed and introduced the course delineated here. Our initiative was that as dental educators, we found that our senior students were often at a loss when faced with the reality of having to choose a career and enter the job market. Some of them did not have any idea about what careers were possible with a dental degree apart from chairside work, but we often met students who had not even thought about their career before the end of their studies. Our goal was to help these students at this critical point. Here we describe the course and our initial experiences with it, with an emphasis on student feedback.

Methods
Aims of the course
In terms of career development, the course sets out aims at multiple levels. To formulate our aims, we used Donald Super's theory of career development as a framework [23, 24]. In Super's career lifespan, university students fall into the specification (18 to 21 years of age) and implementation (22 to 24 years of age) substages of the exploration stage (15 to 24 years of age). The goals linked to these substages are career planning, training for the specific goals, and career initiation. Strictly speaking, fifth year dental students (aged 22–23 years) fall into the implementation substage. However, Super's model of career development as a model of linear development built of consecutive stages could work only in a

system that actively supports the accomplishment of every stage. The real situation is not so clear-cut. Hur and colleagues demonstrated how different medical students can be in terms of how ready they are for a career [25]. We had similar experiences. Therefore, we decided to add aims to address the entire exploration stage, including also the crystallization substage (15 to 17 years in the original model). The main reason for including that early substage was that dentistry opens the way toward various career tracks (as mentioned above), of which chairside work is but one. We assumed that our students did not have that information in high school, when they went through their "first" crystallization stage, and we wished to give them the chance to briefly revisit that substage with the new information in mind. This is of vital importance, as the goal of this substage is the self-assessment of one's needs, values, competencies, and opportunities. Without that, no sound career decision is possible.

The primary aim of the course is to help students with their career expectations and develop their identity as a professional workforce. The secondary aim is to teach skills that students can use when applying for a job. After completing this course, students should be able to write a CV and motivation letter, prepare their own professional portfolio, and assess if a potential workplace meets their character, goals, and expectations. The rationale for this is twofold: first, it has been documented that organizing background materials, practicing answers, and doing one's own research on potential employers could improve the outcomes of a job interview [26]. Second, activities related to the secondary aim also contribute to the primary aim. Detailed study goals are presented in Table 1.

Course design
The course consists of three consecutive phases, and the various activities included address the different substages in Super's exploration stage, as described above. The phases and tasks related to the substages are shown in Table 1.

The first phase consists of introductory lectures about job options and opportunities available for the newly graduated dentist. These lectures provide detailed information about specialization as well as about working as a private dentist versus a state employee (or a combination of the two). Emphasis is placed on the personal attitudes, skills, and abilities that students need to find their place in the settings discussed above. Although the primary goal of these lectures is to familiarize students with local (Hungarian) characteristics, an overview of key differences between EU member states and some overseas countries, such as the United States and Australia is also provided. While focusing on a well-

Table 1 Course structure

Addressed career development substage	Topic/Activity	Study goal	Allocated time	Course phase
CR	Opportunities as a fresh graduate	The student knows about his or her opportunities as a fresh graduate (including dental work)	1 h	TP/C
CR	Career options as a dentist	The student knows about his or her opportunities specifically linked to the dental degree	1 h	TP/C
CR	Assessment of personal character traits, strengths and weaknesses	The student has a fundamental career-related concept of himself or herself as a person	2 h	TP/C
IMP	Study sample CVs to demonstrate main points of CV writing	The student knows the formal and stylistic requirements of a professionally written CV	2 h	TP/C
SP	Coaching in career planning (optional, by appointment)	The student has personalized feedback on his or her actual career dilemmas	1 h/student	TP/C
IMP	Preparation of own CVs (extra-class)	The student has a formally and content-wise correct CV	NA	PP
IMP	Motivation letter and professional portfolio samples	The student knows what (not) to include in a motivation letter and portfolio	1 h	PP
IMP	Preparation of own motivation letter (extra-class)	The student has a motivation letter	NA	PP
IMP	Evaluation of CVs in group, suggestions, corrections	The student can critically analyze a CV and use this knowledge to enhance his or her own CV	1 h	PP
IMP	Evaluation of motivation letter in group, suggestions, corrections	The student can critically analyze motivation letter and use this knowledge to enhance his or her own motivation letter	1 h	PP
CR/SP	Making career decisions	The student can identify short- and long-term goals (vs. consequences) and think consciously about a career decision	1 h	PP
SP	Establishment of short- and long-term goals	The student can set well-defined career goals and expectations for himself or herself	2 h	PP
IMP	Simulated interview (individual)	The student has prepared for a job interview-like situation and tried what it feels like to be interviewed for a job	4 h	IP
SP	Assessment of possible workplaces/jobs	The student knows how to gather information about a potential workplace/position and how to assess that information	1 h	IP
IMP	Job fair	The student meets real employers, has a chance to apply for jobs	4 h	IP

Legend- TP/C: theoretical preparation/contemplation; PP: practical preparation; TO: task to be completed outside the class IP: implementation practice; CR: crystallization; SP: specification; IMP: implementation (Career development substages from Super's model, see Methods)

defined topic, these lectures are also interactive and flexible in many ways. First, the students are actively involved, they can ask tquestions any time, or even change the direction of the lecture within the limits of the topic. Second, students have the chance to ask the lecturer to incorporate information about specific settings, countries, etc. of interest into the lecture that follows. This way, each student group can fine-tune the lectures to their own needs and interests. Third, dental professionals are regularly invited as guests (either in person or via Skype), so participants can gain more personal experience and impressions. The general aim of this theoretical preparatory phase is to support "re-crystallization", that is, to help students set realistic career expectations by providing adequate information and role models.

The second phase, practical preparation, focuses on CV and motivation letter writing as key skills necessary for a successful job application. The characteristics of the genres are explained, and samples are provided. As an extra-class assignment, students must prepare their own CV and motivation letter. The instructor is actively involved in the writing process by giving feedback on the draft versions and recommending changes if necessary. The primary aim of this phase is not to teach these genres but to provide a chance for students to think about their character and goals and to go through their strengths and weaknesses. The resulting "inventory" not only helps the individual student to think about what to communicate when first applying for a job, but also to identify an apparently optimal starting point for his/her career. As the course is announced for students in their

final year, CVs and motivation letters prepared here can directly be used.

In the third phase, students finalize their CV and motivation letter, and individual mock job interviews are video-recorded. The recordings are then evaluated by students and teachers together. We chose interview simulation because interview is the most frequently used and most highly weighted employee selection method, and evidence suggests that interview performance can be efficiently improved via coaching and feedback [27–29]. In the same phase, the course culminates in a job fair, which is a real-life, semi-formal encounter between the participants of the course and various local employers. Employers are invited to register if they are interested in employing newly graduated dentists. The event is organized at the end of the semester, usually at a popular local off-university meeting place, so personal encounters between students and the representatives of employers can take place in a neutral environment. The representatives of the employers have the CVs and motivation letters of the students, and they can talk to those whose introduction they like. The session has no strict rules. The students may also initiate conversation with the employers of their choice. Such a session lasts 3 to 5 h and is best described as a social event with a well-defined purpose.

An optional, individual, sixty-minute coaching session is also part of the course. This is done by appointment. Although this session is optional, every participant has taken the opportunity so far.

The course is taught by a two-person team: an experienced dental educator (who is also a practicing dentist, MA) and a health and marketing communication specialist (RAS).

Student evaluation is based on participation, class activity, and the quality of the prepared materials. A five-point grade system is used, where 1 means failed and 5 means excellent.

The number of participants is limited to 15 students/semester/language (the course is held in English and in Hungarian, see below).

Finally, the course is optional but with a credit value; completion of the course counts toward the completion of dental studies.

The course components and their contribution to the aims of the course are summarized in Fig. 1.

Participants

So far two semesters have been completed and 39 students have finished the course (12 men and 27 women). The mean age of the participants was 24.6 (±2.3) years. All students were in their fifth (final) year at the Faculty of Dentistry, University of Szeged. As the Faculty offers dental education in two languages (Hungarian and

English), this course was also held in these two languages. Of the 39 students, 28 attended the Hungarian course (mean age: 23.9 ± 1.3 years) and 11 attended the English course (mean age: 26.4 ± 3.2 years). Participants of the English course came from 7 different countries (both EU and non-EU countries).
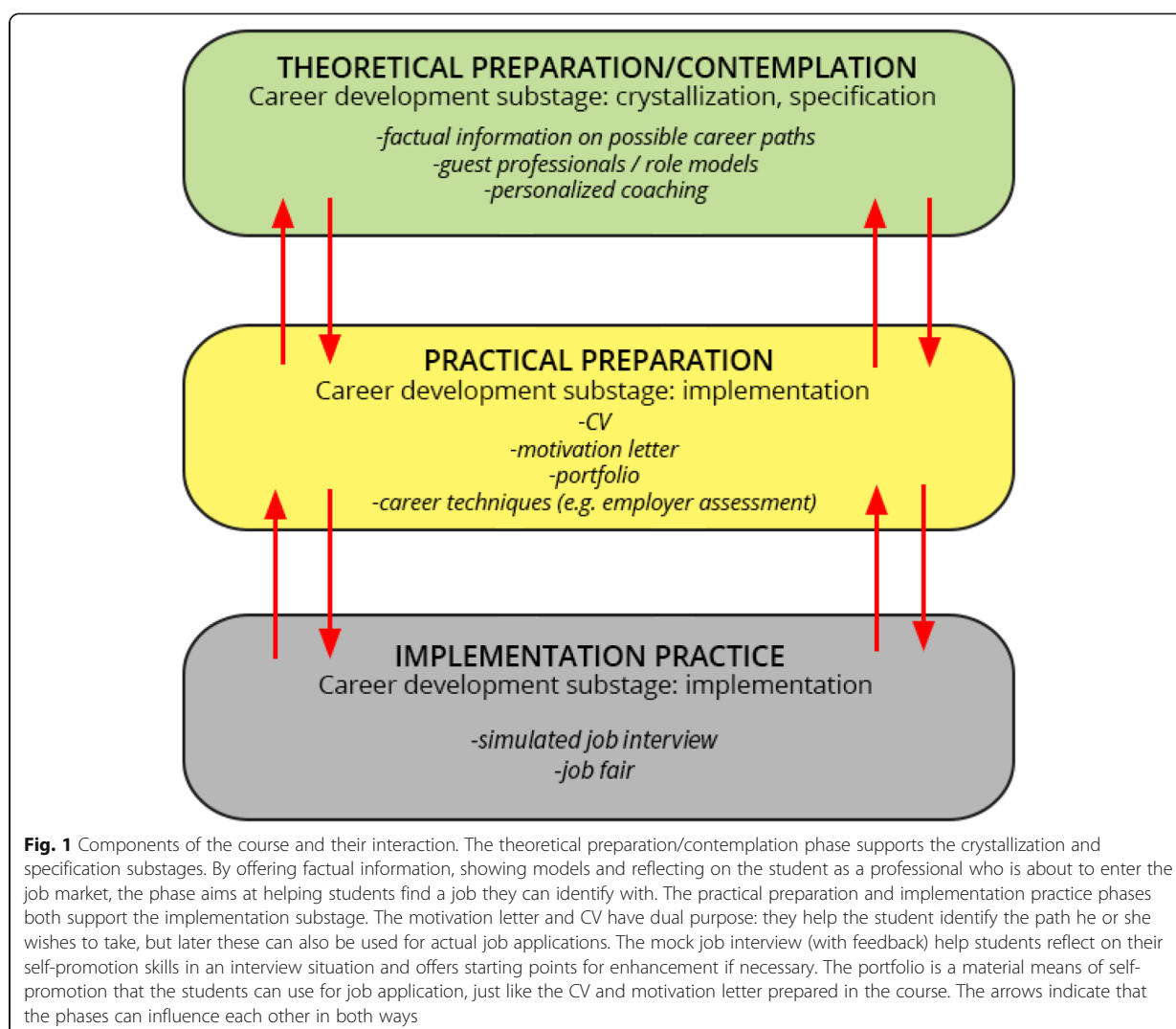
Student feedback

A short anonymous questionnaire about the course and its methodology was administered to all participants to assess the reception of the course. The questionnaire was approved by the Institutional Review Board at the University of Szeged. The questionnaire consisted of 20 items, of which the first two were demographic in nature (gender and age). The rest were statements, which the students had to evaluate on a 5-point Likert scale (1-strongly disagree, 2- disagree, 3- neither agree nor disagree, 4- agree, and 5- strongly agree). Two of the 18 statements were negative controls to check for the validity of answers. The statements aimed to assess five main aspects: general impression, satisfaction with the course (2 items); personal development (4 items); CV/motivation letter/portfolio (5 items); career development techniques (e.g., assessment of potential employers, 4 items); job fair (3 items). Each statement was characterized by a mean score (with standard deviation).

Mean scores were calculated as the simple arithmetic mean of the individual scores given by each student (1 to 5). A higher mean, therefore, represents higher average agreement with the given statement (except for the negative controls). An initial ANOVA indicated no significant difference between Hungarian and English-speaking students in any of the items (at $p < 0.05$), therefore the two groups were analyzed together. This method of data analysis was preferred, as Hungarian students predominated in our sample (~ 72%), which made a separate analysis meaningless. The item-wise summary of the results is presented in Table 2. Results were also evaluated by question sets (i.e., regarding the five main aspects described above) by calculating the grand mean of all items. Results of the aspect-wise analysis are shown in Fig. 2. Calculations were done in SPSS 21.0 (IBM, USA).

As the course is new, it is difficult to assess whether the course influences success in finding a job or job satisfaction. Therefore, we focus on student feedback on the course itself, which is an important indicator of how effective the course is, and how well it fits into the curriculum. Obviously, if students find a course useful, interesting, and well-constructed, the efficacy of that course in terms of knowledge transfer increases.

Our hypothesis was that the course would be generally welcome by students (high mean scores on positive items).

Fig. 1 Components of the course and their interaction. The theoretical preparation/contemplation phase supports the crystallization and specification substages. By offering factual information, showing models and reflecting on the student as a professional who is about to enter the job market, the phase aims at helping students find a job they can identify with. The practical preparation and implementation practice phases both support the implementation substage. The motivation letter and CV have dual purpose: they help the student identify the path he or she wishes to take, but later these can also be used for actual job applications. The mock job interview (with feedback) help students reflect on their self-promotion skills in an interview situation and offers starting points for enhancement if necessary. The portfolio is a material means of self-promotion that the students can use for job application, just like the CV and motivation letter prepared in the course. The arrows indicate that the phases can influence each other in both ways

Results

The results are shown in Table 2 and Fig. 2. As for the item-wise results (Table 2), most statements received a mean score above 4 (agree or strongly agree), which indicates a high level of general satisfaction with the course. These results confirmed our main hypothesis. Standard deviations were low with two notable exceptions, item #10 (4.03 ± 1.197) and item # 16 (3.77 ± 1.459). These items ask the respondent about the perceived effect of feedback on the simulated interview and if he/she has found a potential employer during the job fair, respectively.

Negative statements #3 and #9 received a mean score below 2, indicating that participants did not find having to think and talk about their own personality excessively uncomfortable, and they did not consider knowledge about how to assess a potential employer useless (the latter was control question for item #6). The results, therefore, did not confirm our hypothesis regarding the personal/psychological aspect, but standard deviation of the mean of item #3 (1.77) was almost 1.0, which is the third highest standard deviation.

Results of the aspect-wise analysis are presented in Fig. 2 in an increasing order of grand means. All studied aspects scored between 4 and 5, but an order is clear. The general satisfaction aspect got the highest grand mean, which again supports our main hypothesis. As for the particular aspects, practical matters, such as CV writing, composition of a motivation letter, and other career techniques earned the second and third highest grand means. Job fair ended up fourth (with high standard deviation), and activities/tasks related to personal development were associated with the lowest grand means.
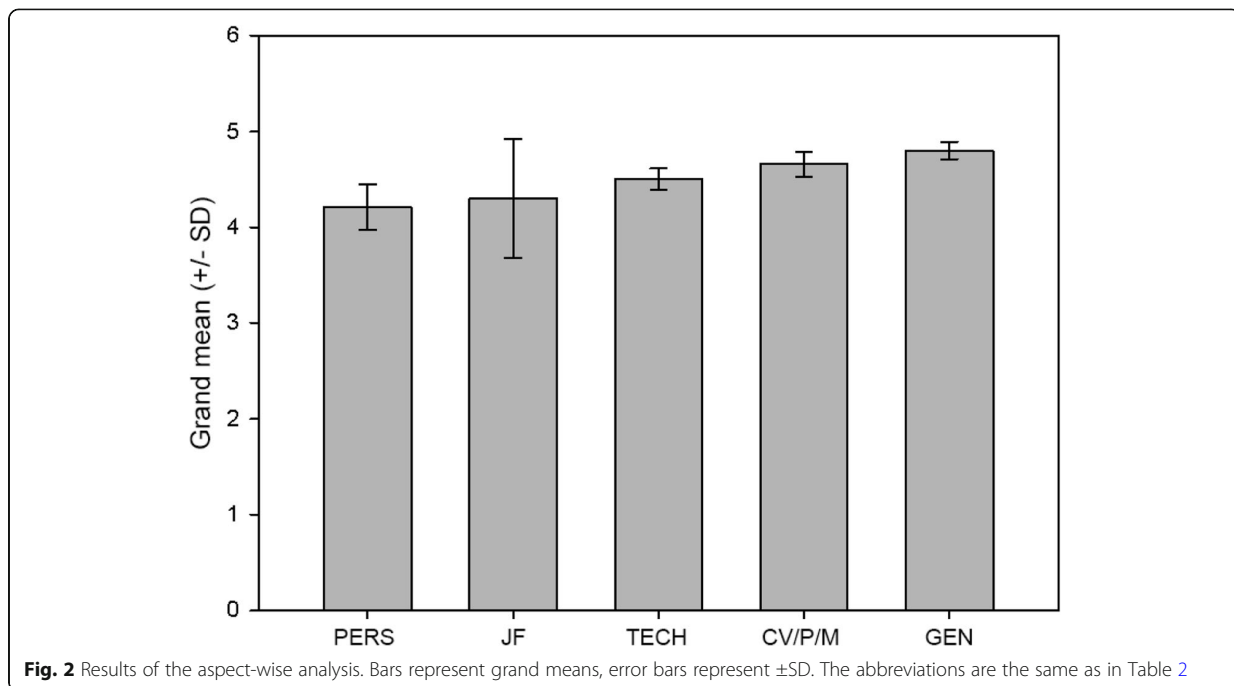
Discussion

By developing a career skills course for dental students, we wished to address a simple but important problem:

Table 2 Student feedback on the course

STATEMENT	Mean	SD +/−	Group
1. Guidance on how to create a professionally written CV will help me get the job I want.	4.85	.366	CV/P/M
2. The assessment of my personal character traits, strengths and weaknesses helped me to clarify what career fits me best.	4.13	.767	PERS
3. I found it uncomfortable or embarrassing to explore my personal characteristics, strengths and weaknesses.	1.77	.959	PERS*
4. Learning about what jobs I can have and what they mean in terms of career made me more confident about looking for a job.	4.46	.600	TECH
5. Individualized career advice received in this course did help me plan my career.	4.62	.747	TECH
6. Guidance on how to assess a potential employer/position helped me create short and long-term goals.	4.41	.751	TECH
7. Studying sample CVs helped me create a CV that accurately reflects the skills I can bring to a job.	4.64	.668	CV/P/M
8. The evaluation of a professionally made portfolio sample gave me a clear idea of how to develop my own professional portfolio.	4.49	.601	CV/P/M
9. Guidance on how to assess a potential employer/position did not me create short and long-term goals.	1.31	.569	TECH*
10. The feedback I received following the simulated interview allowed me to identify areas that need improvement before an actual interview.	4.03	1.197	PERS
11. The interaction, suggestions and feedback received during the group discussion helped me improve my own CV.	4.49	.644	PERS
12. The feedback I received on my motivation letter gave me clear guidance on how to improve it.	4.62	.544	CV/P/M
13. The feedback I received on the materials I created in this course made me more confident about applying for an actual job.	4.69	.521	CV/P/M
14. I think that the Job Fair has been a useful experience in terms of finding my future workplace.	4.64	.628	JF
15. The Job Fair gave me an increased sense of self-confidence for future job interviews.	4.46	.720	JF
16. I found workplaces at the Job Fair that I can imagine as my first workplace after graduation.	3.77	1.459	JF
17. I feel that the personalized/interactive format was a more effective way to learn in this course than a lecture format would have been.	4.82	.451	GEN
18. Overall, this course gave me the knowledge, confidence, and motivation to seek employment after graduation.	4.69	.731	GEN

Legend- Groups of questions: CV/P/M: CV, portfolio, motivation letter; PERS: personality and self-knowledge; TECH: career-related techniques; JF: Job fair; GEN: general impressions. *: negative control question

Fig. 2 Results of the aspect-wise analysis. Bars represent grand means, error bars represent ±SD. The abbreviations are the same as in Table 2

in our teacher- and academic knowledge-centered system of dental education, the newly graduated dentist often finds that at the university, he/she learned the entire profession, but got little knowledge on how to reflect on himself/herself as a professional or as someone who is about to start a career. The lack of career skills and a concept of oneself within the profession may lead to mistaken career choices and secondary job dissatisfaction, which ultimately leads to burnout, and the individual gets stuck in a situation that leads to a severe deterioration of quality of life. This is not unique to dentistry, but - as outlined in the introduction - dentistry is a particularly stressful profession. Unfortunately, this is true not only for chairside work; being a dental teacher [30] or a dental leader [31] can be the source of just as much stress. We propose that being conscious about one's professional self, making conscious career choices, and having a sound knowledge of one's possibilities with a degree in dentistry (i.e., mobility) can serve as important coping resources.

We considered it to be of crucial importance to introduce this course as curricular with a credit value. There are two main reasons for this. First - even if it is not a mandatory course -, if a course is curricular, it carries the message that the faculty considers its contents related to the profession. Second, a credit value means that the student is rewarded for participation also in terms of progress in his/her studies. This latter aspect is important because students in our dental school are on an especially tight schedule in their final year, and they

carefully assess the cost- benefit ratio of any subject they take. Therefore, it is possible that they do not take an optional course they would otherwise consider interesting or useful. With this format (optional curricular course for credit), we reached an above-average number of participants for a final-year optional course in the Hungarian group and average participation in the English-speaking group. The reason for the latter is probably that only a fraction of our English-speaking students are interested in Hungarian career options, those who wish to stay in Hungary for practice or specialization after graduation. This observation tells us that the English part of the course needs to be fine-tuned so that it can address a wider range of our English-speaking students.

Our hypotheses, described above, were mostly supported by the results. Students were highly satisfied with the course, and practical aspects (CV, motivation letter, etc.) were among the highest-rated ones. According to the item-wise analysis, the most appreciated features of the course were its interactivit (item #17; 4.82 ± .451) and the chance to learn how to write a CV properly (item#1; 4.85 ± .366). Of the five items obtained the highest scores, three were related to practical matters and two assessed general satisfaction. The item received the lowest score was #16 ("*I found workplaces at the Job Fair that I can imagine as my first workplace after graduation.*"). This came as no surprise, as the job fair offers a rather narrow, strictly local sample of employment possibilities. Some may find a job here, but it is

more a training site where students can practice meeting employers without the usual real-life risks. Apart from this, the job fair scored high, as item #14 (*"I think that the Job Fair has been a useful experience in terms of finding my future workplace."*) received a score of 4.64 ± .628. Items related to personal characteristics/personal growth, however, tended to obtain 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, as mentioned in the introduction. Therefore, the scores do not reflect dissatisfaction, but rather the unusualness of the situation. This result may also reflect that it is more difficult to assess the use of self-knowledge and various psychological skills than that of a CV or a motivation letter. A further possibility is that statements like *"The assessment of my personal character traits, strengths and weaknesses helped me to clarify what career fits me best."* (item #2) are just too difficult to score shortly after the course, as such changes probably take more time. In this sense, the results may simply reflect the inaccurate wording of the corresponding item, which prompts us to revise these items before further use. The results of the aspect-wise analysis (Fig. 2) corroborate these findings.

Most importantly, our student-centered course worked surprisingly well in a traditionally teacher-centered educational environment, where university students are rarely encouraged to be active participants in courses. This is in contrast with the results of studies describing the difficulties of introducing student-centered elements in teacher-centered curricula [32, 33]. We propose that the success of the course can be traced back to a few key factors. The first of these is the very subject of the course and its place in the curriculum. It is known that the opportunity to formulate meaningful personal learning objectives is a way to engage students in deep learning processes [16, 34, 35]. To senior students, starting a career is indeed an immediate and real personal goal, and working toward that goal is a logical and meaningful objective. Students of the lower grades would probably have found the course less engaging. The second factor is obviously the credit value of the course, through which the course did not only provide the students with important and personally meaningful skills, but also helped them toward finishing their studies. Third, the course was designed and offered by faculty members who were dedicated to the idea of student-centered education, which excluded the problem of faculty reluctance.

It is certainly a weakness of this study that the present instruments allow the assessment of short-term effects and impressions only. For a more accurate and less subjective assessment, we are planning add tests to measure various aspects of career readiness, like Hur and colleagues did in their study of medical students [25]. Finally, we cannot determine at the moment how lasting the effect of the course is. To answer that question, follow-up needs to be organized.

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Conclusions

While it is quite common for universities to offer career skills trainings for undergraduate students, to our knowledge, no other university offers a curricular course of this kind, tailored especially to the needs of dental students. To our knowledge, the closest example is embedded counseling model described by Adams [36], but that model is more focused on students' problems while still at school than their future career.

By sharing our experience, we would like to highlight benefits of formal instruction in career planning skills. Our experience suggests that such a course can be implemented in a teacher-centered educational environment with relative ease, provided that a few conditions are fulfilled. First, the course should be offered toward the end of the curriculum, so that it offers a real, meaningful, personally important goal to the students. To first-year students, for instance, starting a career is a distant issue, and they will probably take the course primarily for its credit value. That way, due to the low level of engagement, little or no transfer happens, and the students will not have the skills and knowledge at their disposal when actually needed. Second, the course must be a curricular one, possibly with a credit value, to encourage enrollment and active participation. Third, it is important that the faculty responsible for such a course have knowledge of and be dedicated to student-centered methods. If such faculty is not available, it is worth considering the findings of Kim and Hwang [37], who identified three main characteristics of medical teachers who use student-centered methods. They found that basic sciences faculty, those with more teaching experience and those who are more knowledgeable about the school's educational objectives show less resistance to these methods and use them more frequently. This also carries the very important message that teaching the faculty about the educational objectives of the school is a way to increase readiness to change and openness to the student-centered approach.

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In summary, the success of our course shows that the often-mentioned difficulty with introducing student-centeredness in a teacher-centered environment can be overcome even in a post-socialist country where the rigidity of higher education is still a problem. The application of such methods, however, requires the careful selection of the subject, the target group and the faculty.

Abbreviations
CV: Curriculum vitae; CV/P/M: Curriculum vitae, portfolio, motivation letter; DMD: Doctor of Dental Medicine; EU: European Union; GEN: general impressions; JF: Job fair; PERS: personality and self-knowledge; PhD: Doctor of Philosophy; TECH: career-related techniques

Authors' contributions
RMS (Réka Magdolna Szabó) and MA (Mark Antal) developed and taught the course and drafted the manuscript; RMS and JMD (Joan Mary Davis). developed the course assessment questionnaire, administered it and analyzed the results; MA prepared the figures and Tables. JMD reviewed, corrected and finalized the manuscript. All authors have read and approved the final manuscript.

Availability of data and materials
The datasets used and/or analyzed in this study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate
The study was approved by the Human Ethics Review Board of the University of Szeged (approval No. 41/2018), and the study design conformed in all respects to the Declaration of Helsinki. Written informed consent was obtained from all participants.

Consent for publication
Not applicable

Competing interests
The authors declare that they have no competing interests.

Author details
[1]Department of Health Economics, University of Szeged, Faculty of Medicine, Tisza Lajos körút 109, Szeged 6725, Hungary. [2]Missouri School of Dentistry & Oral Health, A.T. Still University, 1500 Park, St Louis, Missouri 63501, USA. [3]Department of Esthetic and Operative Dentistry, University of Szeged, Faculty of Dentistry, Tisza Lajos körút 64, Szeged 6720, Hungary.

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