

## ORIGINAL RESEARCH

# More than just a child: dental students' perceptions of children using a mixed-method approach

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**Abstract**

It is important to understand perceptions of dental students towards children to better design relationship. This study aimed to determine and conceptualize dental students' perceptions of children. The study group consisted of 514 dental students who were asked to complete the statement "A child is like..., because...". The metaphors were sorted into conceptual categories and examined for any significant differences between gender, education level and occupational preference. Quantitative (metaphor analysis) and qualitative (chi-square) analyses were used. Participants produced 421 metaphors under 33 general metaphors. The metaphors were collected under five conceptual categories: children as (1) requiring care, attention and sensitivity; (2) raw material; (3) developing and changing; (4) unpredictable and surprisingly; and (5) hazard. The metaphors were mostly under the "developing and changing" category. There were no significant differences between the groups in terms of gender, education level and occupational preference. Female and clinical dental students mostly produced metaphors in the "requiring care, attention and sensitivity" and "developing and changing" categories, respectively. Metaphor analysis is a useful tool in determining dental students' perceptions. Understanding dental students' perceptions of children can be an important part of fostering positive perceptions in their professional life.

**Keywords**

Children; Dental students; Metaphor; Pediatric dental patients; Perceptions

## 1. Introduction

Dental students are trained to diagnose and treat early childhood caries and oral-dental diseases of children as part of the dental education curriculum [1]. Dental students are expected to acquire the necessary theoretical knowledge, and sufficient clinical and social skills during their dental education [2].

Pediatric dentistry is perceived to be more challenging than other departments [3]. In order to treat a child, technical skills as well as knowledge and experience in the use of behavioral guidance techniques and stress management are required. Dentists may be exposed to children's anger and crying behaviors. Trying to prevent or overcome these behaviors can be very wearisome for the dentist [4]. Establishing healthy communication with a child at a young age is important [5] and trying to maintain the patient's calm during treatment increases the stress level of the dentists; therefore, dentists may avoid treating pediatric patients [3]. The dentist needs to convince the child to cooperate for treatment, and in some cases, dealing with parents may also increase the dentist's stress [6]. The dentist, child patient and parent are considered three main factors that can affect each other positively and negatively and thus determine the psychological environment and quality of the treatment in the pediatric dentistry clinic [7]. Many dentists

find that young children's ability to cope with treatment limits their ability to provide dental care [8], and that providing care to young children is stressful and demanding and takes more time than an adult patient [9].

Dental students are generally inexperienced and insecure in communicating with children and guardians [10], causing a very high level of stress in the pediatric dentistry clinic [11]. Many students find it difficult to treat children because of their dental anxiety, cooperation problems and psychological immaturity [3]. All these difficulties and stress factors affect the attitudes and perceptions of dental students towards children [12].

Metaphor is defined as the meaning of that concept which changes when an object or event is named with the name of another object or event according to the similarity of its symptoms [13]. Simply put, a metaphor is an implicit comparison between two different things that actually have an important point in common. Metaphor analysis may be used as a tool for exploring dental students' attitudes and perceptions about children to identify a conceptual framework that defines and categorizes a child [3]. It can be used as an innovative qualitative analysis method in the field of dentistry.

The main aim of this study was to determine dental students' perceptions towards children. Within this framework, the re-

search questions were (a) What metaphorical images do dental students use to conceptualize a child? (b) What rationales do they present to explain their choice of metaphors? (c) Which conceptual categories can be identified in respect to common features? (d) Do gender, education level and occupational preference affect participants' perceptions?

## 2. Materials and methods

### 2.1 Research model

This study was designed in a cross-sectional and mixed method. This study adhered to the strengthening the reporting of observational studies in epidemiology (STROBE) guidelines and applicable requirements.

### 2.2 Participants

The study group consisted of 514 dental students studying at Sivas Cumhuriyet University, Faculty of Dentistry in the 2021–2022 academic year. Data collection was conducted between 10 September–10 November 2021. According to the inclusion criteria of the study, dental students who were able to speak local language and were mentally and physically healthy were included in the study on a voluntary basis. Students who did not want to participate in the study or who had difficulty expressing themselves in local language were excluded. The sample size was calculated by assuming a desired power ( $1-\beta$  error of probability) of 0.90, a significance level at 0.05, a confidence interval of 95%, and an effect size of 0.15. The sample size calculated was 448. In order to account for possible exclusions and dropouts, the sample size was increased to 514 students.

### 2.3 Data collection

A semi-structured questionnaire was used as a qualitative data collection tool. The literature was reviewed and similar studies [3, 14, 15] on using metaphors to reveal people's perceptions of events or phenomena and the data collection tools used were examined. It was observed that data were collected by asking semi-structured questions (for example, "*Teacher is like...because...*") [15] and it was decided to use this phrase to obtain the study data.

In the first part of the form, general sociodemographic information about metaphors, some examples from other fields were presented and the demographic characteristics of the participants (age, gender, occupational preference, education level) were asked. In the second part, in order to reveal the mental images of the participants regarding their perceptions on pediatric patients, they were asked to complete the sentence "*A child is like...; because...*".

In order to evoke the connection between the "subject of the metaphor" and the "source of the metaphor" more clearly, the concept of "because" was also included and the participants were asked to provide a justification for their metaphors. Before distributing the questionnaire to the included students, the researcher (SE) informed them about the metaphor technique. After the distribution of the questionnaire forms, the participants were asked "*A child is like... because...*". They

were asked to fill in the data collection forms, including the sentence. It was explained that similes can be made by imitating anything (living, inanimate, special, general, abstract and concrete *etc.*). Participants were given a blank sheet of paper with this phrase at the top of the page and asked to submit their thoughts, at the earliest, one day later, using this phrase and concentrating on only one metaphor.

### 2.4 Statistical analysis

Data were analyzed using the mixed-method method; both qualitative (metaphor analysis) and quantitative (chi-square). Qualitative analysis (metaphor analysis) was done in six stages as stated in the literature [15]. These stages are as follows; 1. Naming and labeling, 2. Coding and sorting, 3. Identifying analysis variables, 4. Compiling and categorizing sample metaphors, 5. Ensuring validity and reliability, and 6. Transforming into quantitative data.

#### 2.4.1 Naming and labeling

At the first stage, a preliminary (temporary) alphabetical list of all metaphors provided by the participants was made using the Microsoft Word program. In this step, the name of the metaphor (such as flower or bomb) was coded. For each questionnaire, a sequence number was given and personal information about who produced the metaphor was coded in parentheses immediately after the metaphor. Their classes were indicated as P (preclinical) and C (clinical), while their gender was indicated using the letters F (female) and M (male). (For example, 1PF22 = indicates questionnaire form number 1 that was answered by a 22-year-old female preclinical student).

#### 2.4.2 Coding and sorting

In the second step, the raw data were reviewed and each metaphor was reanalyzed to characterize its' elements. Metaphors and sentences were analyzed under three elements: (1) subject, (2) tool, and (3) ground. The subject is the subject of the metaphor (*i.e.*, in this study, the child). The tool is the term with which the subject is compared, while the ground expresses the nature of the relationship between the subject and the tool. Using this approach, salient features/images, common elements, and similarities between various metaphors could be determined, and each metaphor could be analyzed and disassembled.

A total of 93 forms were excluded from participants who could not produce a valid metaphor and/or appropriate justification based on the following criteria:

A. No clear definition or mention of a metaphor. For example: "Caring for a pediatric patient is torture."

B. Mentioning a metaphor but not providing a rationale. For example: "A child is like an angel."

C. Difficulty placing the metaphor under a clearly recognizable conceptual theme. For example: "A child is like heels. It is very difficult to wear."

#### 2.4.3 Identifying analysis variables

In this stage, a total of 65 metaphors called "well-expressed metaphors" were determined. Before organizing these metaphors into specific conceptual themes, a focus group

discussion with 20 dental students was conducted on the minimum number of metaphors required to create a category. Therefore, in line with the requirements for statistical analysis regarding gender, education level and occupational preference, the following criteria were considered: categories should be based on metaphors stated by (a) more than one participant, (b) participants from at least two different classes, and (c) both male and female participants. Thirty-two forms were eliminated. It should also be noted that each eliminated metaphor corresponds well to one or more of the features that make up the conceptual categories derived from the remaining 33 metaphors. Thus, all the views and ideas of the participants whose metaphors were excluded were represented in the conceptual categories that were ultimately adopted.

#### 2.4.4 Compiling and categorizing sample metaphors

A fourth meeting was held to select a sample statement representing each metaphor. Participants' metaphors included varying degrees of detail. For example, some participants explained their metaphors in one sentence, while others were detailed. Therefore, a statement that we think best represents the particular metaphor was chosen first. Therefore, a list of 33 metaphors was generated with a valid description (title) for each metaphor to use as a reference point for grouping the metaphorical images into specific categories and to validate the analysis. In this way, it was possible to create a cross-tabulation for examining metaphors according to education level, occupational preference and gender. The main purpose at this stage was to create conceptual themes or categories represented in the form of 33 sample metaphors. At this stage, each metaphor was coded to fit into a conceptual theme. For this purpose, the dominant features of the metaphors were searched to determine which conceptual category or theme the participants' metaphors best represented. As a result of the inductive analysis, five conceptual categories were determined. In general, the metaphorical expressions of the participants in the relevant literature were taken as a guide in the development of these categories.

#### 2.4.5 Ensuring validity and reliability

Inter-rater reliability assesses the consistency of a coding system applied. Since the most important steps of the analysis process were the creation of five conceptual categories and the classification of 33 sample metaphors in five categories, two pediatric dentistry faculty members were asked to rank the metaphors independently according to five categories. For this purpose, each coder was given (a) a list of 33 sample metaphors, arranged in alphabetical order and containing an example expression for each metaphor, and (b) a second list, in which five conceptual categories were developed randomly, including a brief explanation for each category. Each coder was then asked to read each metaphor statement and match it to one of the five conceptual categories that a particular metaphor could fall into. It was stated that each metaphor can be assigned to only one category. It was also requested that no metaphors should be left out. Miles and Huberman's formula was used to estimate the inter-rater reliability ratio (Reliability = [consensus/(Agreement + Disagreement)]

× 100). Accordingly, 33 metaphors were classified by two independent coders, and their individual ratings and agreement levels between the researchers were determined. According to Miles and Huberman formula, a reliability calculation of over 90% ensures that the research is considered reliable. The reliability of this study was calculated by accounting for the formula of consensus and disagreement, and the consistency between expert opinions according to the formula was found to be  $(33/(33 + 3)) \times 100 = 0.91$ . Codes with disagreement were reviewed and a common consensus was reached.

#### 2.4.6 Transforming into quantitative data

Data were transferred to the SPSS 21 (Version 22.0; SPSS Inc., Chicago, IL, USA) (Statistical Package for Social Sciences) program to calculate the numbers, frequencies (f) and percentages (%) of metaphors in each category. Cross tabulation (Pearson  $\chi^2$ ) was used to compare the differences between the five conceptual categories in order of gender, education level and occupational preference, and the statistical significance level was taken as 0.05.

### 3. Results

A total of 421 students (response rate: 82.1%) participated in this study. The participant characteristics were 61.5% (n = 259) of the participants were female and 38.5% (n = 162) were male, 18.6% (n = 78) were first grade, 18.2% (n = 77) were second grade, 16.6% (n = 70) were third grade, 23.1% (n = 97) were in the fourth grade and 23.5% (n = 99) were in the fifth grade. In this way, preclinical students consisting of first, second- and third-year students constituted 53.4% (n = 225) of the total participants, while clinical students consisting of fourth- and fifth-year students constituted 46.6% (n = 196). The mean age of the participants was  $21.3 \pm 2.0$  years of age.

#### 3.1 Quantitative findings

Participants produced 421 valid metaphors under a total of 33 sample metaphors that reflected all of them. The metaphors were collected under five conceptual categories: children as (1) requiring care, attention and sensitivity; (2) raw material; (3) developing and changing; (4) unpredictable and surprising; and (5) hazardous. The majority of metaphors produced by the students were in the "the developing and changing pediatric dental patient" category. The frequencies of the metaphors ranged from four to 50. Table 1 presents the distributions and frequencies, sample metaphors, main themes and characteristic participant responses for each of the five conceptual categories. While the most commonly reported metaphors belonged to the "developing and changing" (28.6%) category, the less commonly reported metaphors belonged to the "hazard" category (12.5).

The negative conceptual theme (e.g., hazard) was based on the rationale that children have strong potential to show dangerous behaviors towards both themselves and the dentist, especially during the treatment phase. Therefore, dentists should be more careful and give priority to taking more extensive precautions when treating children.

**TABLE 1. Frequencies, sample metaphors, main themes and characteristic participant responses for each of the conceptual categories (n = 421).**

Conceptual Category	Cate-gory	Frequency (%)	Metaphor (frequency)	Main theme	Sample Comments
Requiring attention and sensitivity	care, and	94 (22.4)	Pet (26), diamond (19), shame plant (18), precious metal (17), vase (14)	<p>*Children need care and attention to be approached with sensitivity and care.</p> <p>*Necessity of the dentist to approach and treat pediatric patients with care, or to try to establish a healthy and trusting physician-patient relationship in terms of the pediatric patient-dentist.</p> <p>Pediatric patient-dentist relationship.</p> <p>*Dentists were seen as healing, restorative, and affectionate (e.g., stink bug, vase).</p>	<p><i>“A child is like a pet because sometimes, no matter how close we try to help, it closes and won’t let go. The better our initial approach to it, the more it allows for treatment.” (23, C, M)</i></p> <p><i>“A child is like a diamond, because communicating with the child in a good way and gaining the child’s trust and persuading the treatment is as difficult as the formation process of the diamond and it takes time.” (20, P, F)</i></p> <p><i>“A child is like a k shame plant because when you can’t relieve their worries, anxieties and fears, it shuts itself up and defends itself like the leaves of squid.” (23, C, F)</i></p>
Raw material		72 (17.4)	Mirror (24), glass (23), play dough (8), canvas (8), blank page (6), notebook (3)	<p>*Children give reactions in the same way they are treated. It gives direction and shape to the oral and dental health of the adults in the treatment and/or education given to children.</p> <p>*The first impression left in children, dental experience, education and treatments are the basis for the dental perceptions and oral health behaviors of these children in their adulthood.</p> <p>*Dentists are seen directing and shaping.</p>	<p><i>“A child is like a glass because if you don’t heat the glass enough, it will either take shape or break. Before and after starting the treatment, it is necessary to establish good communication and direct it.” (19, P, F)</i></p> <p><i>“A child is like a play dough because it goes on how we shape it. The behavior of the first dentist he meets, the way he approaches the child will change his attitude towards the dentist and treatments in the future.” (25, C, F)</i></p> <p><i>“A child is like a notebook because the better we fill in the introductory sentence, the more durable and meaningful the development and outcome phases in the coming years.” (20, P, M)</i></p>
Developing and changing	and	120 (28.6)	Flower (50), sapling (26), tree (18), plant (14), garden (12)	<p>*The necessity of both helping children in the process of change and development over time and helping this process progress in a positive way.</p> <p>*When children are guided in a suitable environment, positive progress in oral and dental health and education can be achieved and a healthy future can be achieved as a result.</p> <p>*Each child’s growth and development are different, and therefore, dentists need to take a specific approach according to these characteristics of pediatric patients.</p> <p>*Dentists were seen as ministers, magnifiers and modifiers.</p>	<p><i>“A child is like a flower because if you give water and love to the flower on its branch, it gives more flowers. Just as you show interest and compassion to pediatric patients, he will open up and show you more.” (23, C, F)</i></p> <p><i>“A child is like a sapling because, if sufficient conditions and environment are created for a sapling, if it takes root and grows, if there is sufficient knowledge, skills and confidence among children, their perspective on dentistry will change.” (22, C, F)</i></p> <p><i>“A child is like a tree because if we protect our trees, we protect our future. If we put oral health awareness in current children, the oral health of adults and society will be better in the future.” (19, P, F)</i></p>

(continues)



TABLE 1. Continued.

Conceptual Category	Frequency (%)	Metaphor (frequency)	Main theme	Sample Comments
Unpredictable and surprisingly	82 (19.5)	Book (13), surprise egg (11), game (11), puzzle (10), gift (9), rainbow (7), box (6), season (5), funfair (4), space (3), cloud (3)	<p>*Pediatric patients show unpredictability during treatment or at different treatment sessions.</p> <p>*Each child patient may react differently to the dental treatment applied.</p> <p>*Since each child's personal characteristics are different, dentists should be more flexible when guiding behavior and offer appropriate behavior guiding techniques according to the child's characteristics.</p> <p>*Dentists were seen as distracting and entertaining.</p>	<p><i>"A child is like a book because just as we discover different things on each page of the book, we learn and surprise with each movement of the children."</i> (23, C, M)</p> <p><i>"A child is like a surprise egg because they are cute and sweet in appearance. Then they reveal themselves like surprise pieces coming out of the egg. You never know what awaits you."</i> (23, C, M)</p> <p><i>"A child is like a game because sometimes it requires a lot of attention and sometimes a lot of effort. We should always be prepared for surprises when treating a child."</i> (22, C, M)</p> <p><i>"A child is like a funfair because children are both fun and action-packed and sometimes full of fear."</i> (23, P, F)</p>
Hazard	53 (12.5)	Bomb (18), alarm (14), sugar (9), wind (4), balloon (4), race (4)	<p>*Some negative and uncontrollable behaviors of children during treatment pose a danger to both the child and the dentist.</p> <p>*The adaptive behaviors of children before the treatment may change during the treatment phase and may adversely affect the treatment.</p> <p>*Children's behavior can change at any time and they can make dangerous movements.</p> <p>*Dentists were seen as protective and preventive.</p>	<p><i>"A child is like a bomb because you don't know when they will cause problems and complicate the treatment."</i> (22, F, F)</p> <p><i>"A child is like a sugar because they are very sweet and loved, but they usually cry out of fear of the doctor and make things very difficult."</i> (21, F, F)</p> <p><i>"A child is like an alarm because they start crying when you least expect it. To silence them, you must break all your concentration and then silence them."</i> (20, P, F)</p>

The positive conceptual themes were based on the following grounds: (a) the need for the dentist to approach and treat pediatric patients with care, or to try and establish a healthy and trusting physician-patient relationship in terms of the pediatric patient-dentist relationship; (b) the first impression, dental experience, education and treatments for pediatric patients form the basis of these children's perceptions of dentistry and oral health behaviors in their adulthood; (c) the need for dentists to know the mental and physical developmental processes of pediatric patients and to act in accordance with the characteristics of these processes; (d) the necessity of dentists to apply appropriate or unique methods to each child's personal characteristics when guiding and treating pediatric patients.

### 3.2 Qualitative findings

Table 2 presents a cross-tabulation of the dental students' perceptions of dentists after stratification of the data according to gender, grade level and occupation preference. In terms of gender, the minimum expected cell count was 20.27 and  $\chi^2 = 4.307$ ,  $df = 4$  and  $p = 0.36$ . Although there was no statistically significant difference between the groups, females defined the child the most in the "requiring care, attention and sensitivity" (23.0%) category, while men most often defined them in the "developing and changing" (29.5%) category.

In terms of occupational preference, the expected minimum number of cells was found to be 24.57 and  $\chi^2 = 7.589$ ,  $df = 4$ , and  $p = 0.10$ . Although there was no statistically significant difference between the groups, those who preferred the dentistry profession defined the child in the "developing and changing" (26.5%) category, while those whose first choice was not dentistry defined the child in the category of "requiring care, attention and sensitivity" (25.4%).

In terms of education level, the expected minimum number of cells was found to be 26.24 and  $\chi^2 = 1.442$ ,  $df = 4$ , and  $p = 0.83$ . Although there was no statistically significant difference between the groups, both preclinical and clinical students mostly defined pediatric patients in the category of "developing and changing" (33.0%) and (25.3%), respectively.

## 4. Discussion

In this study, dental students produced a metaphor to describe the child image in their minds and justified this metaphor. Metaphors created by the students were grouped under five different conceptual categories, considering their reasons. These categories were classified as; a child as (1) requiring care, attention and sensitivity; (2) raw material; (3) developing and changing; (4) unpredictable and surprising; and (5) hazardous. Dental students' perceptions of children were also compared in terms of gender, occupational preference and education level. No statistically significant differences were found between the groups regarding all tested variables.

As a major methodological contribution and strength of this study, metaphor analysis was used, which is a relatively unknown and uncommon qualitative method in dental literature. Literature delineates that there has been very limited attention towards metaphor analysis in dental literature; however, this analysis has been well-accepted and performed in many other disciplines. Metaphor analysis enables researchers to let participants express their opinions in their own words [3, 15]. Participants are completely free to write about their cognitive perceptions on paper. With this approach, the researcher can see the ambiguous or hidden beliefs of the participants and observe them from many different perspectives. Similarly, Fitzgerald *et al.* [16] stated that the findings obtained from qualitative studies are rich, detailed, meaningful, interesting and clinically relevant. Therefore, the methodology described in this study can be a new and good source for dental literature.

There are limitations of this study. One limitation is that the findings of this study only describe a limited population, which cannot be generalized. However, it should be noted that this is a characteristic of qualitative research but it has been argued that qualitative research aims to capture a range of views and experiences. Another limitation is that the study had a cross-sectional design which may limit the scope of evaluation of causality. However, the methodology and conceptual themes described in this study may be a reference to further longitudinal studies which would also investigate causal and mediating relationships. In addition, the current study created

**TABLE 2. Crosstabulation of the dental students' perceptions of children by gender, education level and occupational preference.**

Conceptual Category	Gender		Education Level		Occupational Preference	
	Female (n = 259)	Male (n = 162)	Preclinical (n = 225)	Clinic (n = 196)	First choice (n = 195)	Not first (n = 226)
Requiring care, attention and sensitivity	56 (23.0)	36 (24.7)	47 (23.5)	39 (20.6)	38 (21.4)	54 (25.4)
Raw material	45 (18.5)	24 (16.4)	30 (15.0)	36 (19.1)	37 (20.9)	32 (15.1)
Developing and changing	52 (21.4)	43 (29.5)	66 (33.0)	48 (25.3)	47 (26.5)	48 (22.7)
Unpredictable and surprisingly	53 (21.8)	26 (17.8)	36 (18.0)	38 (20.1)	38 (21.5)	41 (19.3)
Hazard	37 (15.2)	17 (11.6)	21 (10.5)	28 (14.9)	17 (9.7)	37 (17.5)
	$\chi^2 = 4.307$		$\chi^2 = 1.442$		$\chi^2 = 7.589$	
	$p = 0.36$		$p = 0.83$		$p = 0.10$	

a conceptualization rather than prevalence, and the strengths of the analyses are based on statistical assumptions about the distribution of variables. Thirdly, the presumptive effects of several variables should be investigated because they may influence participants' perceptions.

The students produced the most metaphors in the "child as developing and changing" category and produced the least metaphors in the "child as hazard" category. The "hazard" category was considered the only definitive negative perception category. In this category, students described children with their negative aspects, and that they had to be alert during treatment. The participants saw the variable nature of children as dangerous and thought that they should take necessary precautions against potential sudden dangerous behaviors. There may be negative or extremely negative behaviors, including physical violence, such as crying, shouting and even hitting, kicking and biting, that children show that cause this negative perception [17]. The child's anxiety or the negative behavior of the family can also trigger this situation [17]. These findings are very compatible with previous literature [4, 5, 18]. Clinical dental students who produced metaphors in this category may be exposed to high levels of stress in the pediatric dentistry clinic because they are inexperienced and therefore insecure in communicating with the child and parents [19]. At the same time, even if the participant did not encounter any negative child-patient behavior, their fear or prejudice about caring for a child-patient and even their personality structure may have caused such a perception [20]. In fact, personality structure has been considered as a source of stress in itself [21].

The age and experience of the student and dentist can also affect their perception of a child [22]. A previous study reported that younger dentists are less "authoritarian" in behavior management than their older colleagues [23]. It has also been reported that younger and less experienced dentists have higher rates of dental anxiety towards their patients than their older colleagues [24]. A previous study [25] which evaluated the stress and coping methods of students during the first pediatric restorative procedure, presented that dental students thought that they would experience high levels of general anxiety during the first pediatric patient treatment, and they wanted to learn stress management techniques to manage this anxiety. It was observed that the more pediatric patients were treated by the students, the less anxious they were. From this point of view and coupled with the findings of this study, it can be argued that as the experience of the student in caring for children increases, their stress decreases and they can communicate more easily with the child. For this reason, it is quite natural for an inexperienced preclinical dental student who has met or never met a child patient to perceive a child as a danger, thus moving in a protective/preventive position.

Previous studies [3, 26] reported that education level (pre-clinical/clinical) of dental students affects the stress they are exposed to and their perceptions of children. A previous study [3] argued that preclinical students' perceptions of pediatric patients were more negative. Similarly, another study [27] presented a statistically significant difference between the clinical environment perceptions of preclinical and clinical students. While clinical students were mostly distributed in the educational and therapeutic categories, preclinical students

showed a high distribution in the scare and playground categories. The main difference between the two groups is that, unlike preclinical students, clinical students begin to treat pediatric patients in a clinical setting [3]. This is consistent with the current study, and perceptions of dental students can be evaluated as a reflection of a prejudice towards pediatric dentistry or as a reflection of childhood concerns about dental treatments.

Whether students choose to study dentistry on their own and as a first choice or for different reasons is an important factor that can affect their child perception [28]. A previous study [25] reported greater occupational stress and dissatisfaction among those who did not select dentistry as their first choice. It was also observed that clinical stress was higher among those whose first choice was not medicine or dentistry. Consistent with these arguments, in the current study, it was seen that students whose first choice was not dentistry perceived children negatively, in the hazard category, at a higher rate than those whose first choice was dentistry.

Determining dental students' perceptions of children may help educators, researchers and academics to understand whether their positive or negative perceptions have an effect on their physical and psychological behaviors and success during dental treatment. If they have a negative perception, we can change it with the general education given in the pediatric dentistry department or by changing the general structure of the pediatric dentistry clinic, or if they have a positive perception, we can ensure the continuity of this perception. Previous studies [9, 11, 12, 29] have reported that pediatric dental treatment is very common globally, but the rate of pediatric patient care by dentists is low due to the difficulty and time consuming nature of pediatric treatments. For this reason, if we can change the negative perceptions of students in a positive way, we can prevent them from avoiding treating a child patient both in their student life and in their future professional life, and even increase the frequency of seeing a child patient.

## 5. Conclusions

The data obtained from this study and the defined conceptual categories can play a role in organizing educational activities to determine the perceptions of dental students and to improve them. This understanding can be an important part of improving perceptions among students and fostering positive perceptions in their future professional life. This study also concluded that metaphor analysis is a useful tool in determining the perceptions of dental students. Further studies are needed to assess more participants who should be selected from different dental faculties, cities and countries.

## AVAILABILITY OF DATA AND MATERIALS

The data used to support the findings of this study can be made available upon request to the corresponding author.

## AUTHOR CONTRIBUTIONS

BB and SE—conceived the idea; SE—collected the data; BB—analysed the data; and all authors wrote and reviewed the manuscript.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethics committee approval dated 01 September 2021 and numbered 2021-12/01 from the Health Ethics Committee of Sivas Cumhuriyet University in Turkey was received for this study. All participants provided written consent to participate.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest. Burak Buldur is serving as one of the Editorial Board members of this journal. We declare that Burak Buldur had no involvement in the peer review of this article and has no access to information regarding its peer review. Full responsibility for the editorial process for this article was delegated to CEMS.

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