

Determination of 'tooth' perception as the first step in development of oral health in Turkish society: A metaphor study

Gulhan Kocaman

Karabuk University, Faculty of Dentistry, Department of Periodontology, Karabuk, Turkey

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Abstract

Aim: This study aims to reveal the 'tooth' perceptions in the subconscious of individuals through metaphors.

Material and Methods: The sample of descriptive study consisted of 302 adult individuals who resided in Turkey. The data were collected by a semi-structured questionnaire form. The questionnaire was on the sociodemographic information of the participants, while the second part was on their tooth perceptions. It was asked to the participants for determining their tooth perceptions, it was aimed for them to produce a metaphor for their tooth perceptions and explain the reason for producing that metaphor.

Results: At the study, it was observed that 66 different metaphors were produced. The metaphors that were produced were categorized under 3 themes concerning the function, aesthetic and overall characteristics of a tooth based on the things that teeth do. It was found that the tooth perceptions in the society were affected by age, gender, status of brushing, frequency of brushing and the population an individual is in, while these were not affected by income, smoking status and dental concerns. Aesthetical perceptions increased among young people, women and people with higher educational levels. The functional characteristics of teeth were more prioritized among people of more advanced ages, men and with lower educational levels ($p < 0.05$).

Conclusion: With this metaphor study, it was understood that perceptions on teeth were mostly focused on aesthetical and/or functional elements, but there was an insufficient amount of perceptions that focused on teeth as organs with overall characteristics.

Keywords: Tooth perception; metaphor; oral health; dental esthetic; dental function.

INTRODUCTION

Oral and dental health is an indispensable part of general health. In addition to health, teeth are the most significant determinant of our facial aesthetics. Regular, healthy and white teeth always affect the person's self-esteem positively. Especially in terms of gaining one's self-esteem, it is known that teeth make it easier for a person to interact with others in social settings by completing their bodily image. Teeth have sustained their significance from the past to the present. Different meanings have been attributed to teeth based on different cultures, geographies, science and art, and different practices have been utilized in dental treatments (1).

Oral care constitutes the foundation of having a healthy oral and dental structure. The behaviors of an individual related to health and the knowledge of the society on

health are closely related to the individual's attitudes and behaviors. This is why it is needed to establish knowledge and positive perspectives on oral and dental health at early ages.

According to the reports of the World Health Organization, oral and dental problems are accepted to be the diseases that are the most frequently encountered in societies. These are a significant public health problem in especially developed and developing countries (2,3). Losses of teeth and problems related to aesthetics, speaking, chewing and eating lead to situations that affect the quality of life of the person due to problems in social relationships and even emotional problems (4). With dental problems that occur, toothaches, dental anesthesia injections, invasive dental treatments, long treatment sessions, complications that are experienced in treatments and fears caused by lack of knowledge on treatments affect the tooth perceptions of individuals negatively (5,6).

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Corresponding Author: Gulhan Kocaman, Karabuk University, Faculty of Dentistry, Department of Periodontology, Karabuk, Turkey

E-mail: dentist25@hotmail.com

Metaphors are seen as tools where people try to explain events, objects and especially abstract concepts by using different associations. These are used to understand how reality and life are interpreted by the individual. In other words, metaphors help in determining how concepts that are aimed to be analyzed are perceived by individuals. There have been studies in several disciplines that aimed to reveal how individuals perceive the concepts that are aimed to be analyzed through metaphors (7,8). Metaphors have also been utilized in the field of medicine to explain complicated concepts that are misunderstood. The individual's way of understanding a situation will affect their attitude and behavior towards their own health. The way of perceiving factors that lead to diseases will lead the treatment process of a patient to be affected positively or negatively (9,10). Although dental problems are prevalent public health problems, as they do not directly threaten life, teeth do not receive the attention they deserve. This is why it is important to know about 'tooth' perceptions and influential factors.

The purpose of this study is to reveal the 'tooth' perceptions of adult individuals through metaphors and investigate the sociodemographic factors that are influential in the formation of these perceptions.

MATERIAL and METHODS

This study, which was designed as a descriptive study, was started after obtaining approval from the Noninvasive Clinical Research Ethics Board with the decision date 01/11/2017 and number 10/6. The participants who took part in the study on a voluntary basis were informed about the objective and benefits of the study and their role in it, and informed consent was obtained. The study included 302 randomly selected individuals who consisted of 102 adult individuals residing in the province, 100 individuals who visited the Oral and Dental Care Hospital for treatment and 100 university students.

The data were collected by a semi-structured questionnaire. The questionnaire form was prepared by utilizing previous studies where data were collected by using metaphors. The data collection form consisted of two parts. The first part was about the sociodemographic characteristics of the participants and their individual habits related to oral hygiene, while the second part consisted of open-ended question that aimed to determine their perceptions about teeth. For the participants to understand the concept of metaphors, the concept was defined, and an example was provided. For the purpose of revealing their perceptions about teeth, the participants were asked to fill in the blanks in the following questionnaire item: "For me, a tooth is ..., because ..."

Regarding the reliability of the data, two experts were consulted about whether or not the metaphors that were obtained represented the conceptual categories that were determined. After the evaluation by the researchers and the experts, agreement and disagreement rates were

determined. Accordingly, there was an agreement level of 94%. A reliability rate of higher than 70% suggests an acceptable level of reliability, while in qualitative studies, an agreement level of 90% or higher between the expert(s) and the researcher(s) is an indicator that the desired reliability is achieved (11).

At the stage of data analysis, the forms that were collected from the participants were firstly examined for usability and some were removed. The metaphors that were produced were examined based on their stated reasons and collected under 3 categories as aesthetical, functional and holistic meanings. Previous studies were investigated, and experts were consulted for determining these categories. Expert opinion was also utilized in terms of whether or not the metaphors were assigned to the right categories.

The data that were obtained in the study were analyzed in the computer environment, and the categorical variables are expressed in terms of frequencies. Chi-squared test was used to investigate the relationships between categorical variables. The level of statistical significance was accepted as $p < 0.05$.

RESULTS

The metaphors that were formed by the participants were categorized under 3 groups based on the meanings the participants attributed to them. As a result, there were 116 metaphors (38.4%) with aesthetical (psycho-social) meanings (Table 1), 146 (48.3%) with functional (biological) meanings (Table 2) and 40 (13.2%) with holistic (bio-psycho-social) meanings (Table 3). The first three most frequently formed metaphors were found to be health (11.25%), significance (9.93%) and smiling (8.27%).

Table 4 shows the distribution of the metaphor groups based on the sociodemographic characteristics of the participants. Significant results in favor of metaphors with aesthetical meaning were obtained among individuals in the age group of 18-25, women, those with educational levels of high school or higher, those who were not employed, those who brushed regularly and among university students ($p < 0.05$).

Significant results in favor of metaphors with functional meaning were obtained among individuals in the age group of 26-55, men, those with educational levels of secondary education or lower, those who were employed, those who did not brush regularly and among those who visited the dental hospital ($p < 0.05$). The parameters of income level, smoking status, dental checkup visitation status and concerns about dental treatments were not found to have significant effects.

DISCUSSION

It is stated that metaphors are one of the most important tools for revealing how a concept that is aimed to be analyzed is perceived. In the case of success in defining a metaphorical thought, this will have comprehensive

Table 1. Metaphors with aesthetical meaning

Metaphors With Aesthetical Meaning	N	Statements Of Participants Regarding The Reasons For The Metaphors They Produced
Smiling	24	Smiles should grab attention.'
		'A beautiful smile reflects you.'
Organ	2	'It is a smile of happiness.'
		'It is an organ that reveals cleanliness and smiling.'
Diamond	1	'It is an organ that determines quality of life.'
		'...because there is nothing else like it.'
Cleanliness	10	'Requires special care.'
		'It is the first thing people see while someone is speaking.'
Shining	2	'It is important for dental health.'
		'It is eye-catching to the degree of how white it is.'
Shiny	5	'It affects beauty.'
		'It affects appearance.'
Beauty	7	'It affects aesthetical look.'
		'Shiny smiles make one feel comfortable in the society.'
Self-Esteem	2	'A smile is the thing that attracts the most attention.'
		'Teeth are very important for smiling.'
Sincerity	1	'Smiling makes the person beautiful.'
		'One should laugh freely.'
Psychology	1	'It is an important detail in appearance.'
		'Happiness and sadness are revealed when teeth appear.'
White	3	'I cannot be happy without my teeth.'
		'It needs to be clean.'
Care	5	'It makes me feel good when it looks white.'
		'White teeth make a smile beautiful.'
Aesthetics	4	'I like taking care of my teeth.'
		'Teeth grab my attention first.'
Mirror	3	'It is the thing that reveals care.'
		'It is important to look beautiful.'
Eye-Catching	10	'It is the thing that catches the eye at first impression.'
		'It feeds the perception of beauty.'
Order	1	'It is the first thing you see when you start to communicate.'
		'Self-care is completed with teeth.'
Complement To The Face	1	'It reflects you in the first act of communication.'
		'It is very important in speaking.'
Freedom	1	'It needs to be white and regular.'
		'It needs to be high-quality as smiling reflects you.'
Appearance	6	'...for looking better.'
		'If the teeth are beautiful, so is the face.'
Home	1	'Your smile expresses you.'
		'It is what grabs attention the most in one's appearance.'
Love	1	'It shows a person look more beautiful than they actually are.'
		'It is necessary for a good impression.'
Shining Of A Person	1	'It shows itself as much as you take care of it.'
		'Care and attention are necessary.'
Makeup	1	'The teeth are the most eye-catching part of a person.'
		'Cleanliness of teeth makes the person look beautiful.'
Significance	8	'A beautiful smile is important.'
		'It improves physical appearance.'
Machine	1	'It shows the importance you attach to yourself and the other person as it is the thing that is seen first.'
		'It is a machine that grinds food.'
Pearl	3	'A good look of it is more important than anything.'
		'The most important visuals are the teeth.'
Character	1	'They are white like snowflakes.'
		'It reflects cleanliness and beauty.'
Priority	1	'It is the place that is looked at in first eye contact.'
		'It is not an easy thing to express art.'
Art	1	'You do not want to talk to another because of teeth with bad breath.'
		'Neglected teeth affect overall health negatively.'
Socializing	1	'It should impress people with its cleanliness and shininess.'
		'Orderly teeth provide a better appearance.'
Health	1	'It shows the importance you pay to yourself.'
		'What grabs your attention is the reality of life.'
Perfection	1	'It is the most beautiful part of the body.'
Order	2	
Quality	1	
Life	2	
TOTAL	115	

Table 2. Metaphors with functional meaning

Metaphors with functional meaning	N	Statements of participants regarding the reasons for the metaphors they produced
Health	33	'Health starts from the mouth by eating.' 'Nutrition is the main part of health.' 'If our teeth are unhealthy, this affects our whole body.' 'Health starts from the mouth.' 'Cavities harm the body.'
Chewing	11	'It is a helpful element for grinding the food we take.' 'It is needed for a balanced diet.' 'It breaks foods.'
Significance	22	'It allows us to get nutrition.' 'Food is necessary for health.' 'It is necessary for eating.'
Worker	1	'It makes eating easier.'
Pain	2	'It is the region whose pain is the strongest.' 'I am experiencing a problem about toothache.'
Integrity	1	'It completes the human body.'
Meaning of life	1	'Pain reduced my quality of life.'
Life	11	'Nothing can be eaten without teeth.' 'It becomes difficult to eat without teeth.' 'Health starts from the mouth.'
Oral health	2	'Diseased teeth may disrupt oral health and general health.' 'Teeth are our organs that make it easier for us to eat.'
Blessing	1	'It is a way that goes to the stomach.'
Door	1	'It is an entry into the body.'
Diamond	1	'I cannot eat solid food without teeth.'
Eating organ	11	'It allows us to eat things.' 'It serves the function of chewing.' 'It is used for eating.'
Sharp knife	1	'It divides food into small pieces like a knife.'
Tree	1	'If you take care of it, you collect its fruits.' 'We need teeth to be healthy for a good diet.'
Organ	1	'You understand their value when you lose your teeth.' 'It is used for eating.'
Stomach-friendly	1	'It helps the stomach in terms of nutrition.'
Food	8	'I cannot eat without my teeth.' 'The most necessary organ for eating.' 'I can it thanks to it.'
Valuable	2	'We cannot know about our taste without our teeth.' 'It is valuable in terms of health.'
Diamond	1	'We cannot eat solid foods without teeth.' 'It allows us to eat.'
Taste	6	'We have to have a complete taste of life.' 'Life is just tasting.' 'It is a grinder.'
Machine	3	'It has a role in our eating.' 'It is the main factor in many diseases.'
Evolution	2	'Our teeth have evolved according to our food.'
Steel	2	'It is necessary for life.'
Cavity	2	'I have too many cavities.'
Strength	2	'All diseases are transmitted through the mouth.'
Cleanliness	1	'All diseases are transmitted through the mouth.' 'It plays an important role in eating.'
Necessity	5	'It is needed for tasting.' 'It is needed for the health of the body.'
Beautiful	1	'We eat food.'
Tool for living	3	'Life becomes difficult without our teeth.' 'Dealing with life becomes difficult without our teeth.' 'We use it for eating food or biting things.'
TOTAL	140	

Table 3. Metaphors with holistic meaning

Metaphors with holistic meaning	N	Statements of participants regarding the reasons for the metaphors they produced
LIFE	9	'It affects up from all aspects throughout life.' 'We do everything with it.' 'There is no life without it.'
BEAUTY	2	'It contributes beauty to human appearance and allows us to eat for health.' 'A tooth is the initial point for foods that enter the body and a body part that is visible.'
LIFE FORCE	1	'It is the most important factor that affects our lives.'
HEALTH	2	'It affects a person both physically and mentally.' 'It is the most valuable organ related to health and happiness.'
LAUGHING	2	'Laughing is the greatest happiness.'
INDISPENSABLE	1	'Speaking and eating become hard without our teeth.'
NECESSITY	1	'It is needed to look good and be able to eat.'
VALUE	1	'Its value is not appreciated when it is healthy.'
SENSING	2	'It refers to living with taste.' 'It is not only required for looks but also important for nutrition.'
BRAIN	1	'It may dominate the entire body.'
GOLD	1	'The value and importance of health is appreciated.'
DIAMOND	1	'It is very important for our lives.'
EVERYTHING	2	'Nothing can be enjoyed without it.' 'Things that are done with the mouth cannot be enjoyed without teeth.'
WHAT COMPLETES A PERSON	1	'It is very important for elocution and nutritional needs.'
SIGNIFICANCE	6	'It is important in eating and for providing an aesthetical look for my mouth.' 'It is needed for nutrition and beauty.' 'It is needed for both appearance and beauty.'
LAUGHTER	1	'It shows that you are healthy, makes your speech beautiful.'
HELPER	1	'It allows eating, speaking and looking good.'
MIRROR OF A PERSON	2	'It shows the beauty of laughing and the importance of nutrition.' 'It is both an enemy and a friend of a person.'
ME	1	'It shows my quality while speaking or laughing.'
ORGAN	1	'It helps speaking and eating.'
ORE	2	'It has a large share in everything about human life.' 'It is very valuable and expensive.'
SECURITY FORCE	1	'It is the symbol of care, quality and health.'
CAPITAL	1	'It reveals the character of people.'
WHITE HOUSE	1	'If determines the agenda like the White House.'
SOCIALIZING	1	'Teeth that look healthy and white are always like by people, your entourage widens.'
SINCERITY	2	'People get closer by smiling.' 'It is what provides vibrancy to a person's smile and makes the person look sincere.'
TOTAL	47	

Table 4. Comparison of the sociodemographic characteristics of the metaphor groups

		Aesthetic Metaphors n (%)	Function Metaphors n (%)	Holistic Metaphors n (%)	p
Age	18-25	80 (48.8)	67(40.9)	17(10.4)	.001
	26-55	31(26.7)	64(55.2)	21(18.1)	
	56-85	5(22.7)	15(68.2)	2(9.1)	
Gender	Female	71 (47.0)	66 (43.7)	14 (9.3)	.005
	Male	45(29.8)	80 (53.0)	26 (17.2)	
Education	Primary education or lower	14(27.5)	27(52.9)	10 (19.6)	.007
	Secondary Education	12 (22.2)	34 (63.0)	8 (14.8)	
	High school or over	90 (45.7)	85(43.1)	22(11.2)	
Employment Status	Not employed	94(49.0)	79(41.1)	19(9.9)	.000**
	Employed	18(22.5)	48(60.2)	14(17.5)	
	Retired	4(13.3)	19(63.3)	7(13.2)	
Income Level (TL)	0-2000	81(40.3)	97(48.3)	23(11.4)	.420
	2001-4000	31(37.8)	38(46.3)	13(15.9)	
	4001 or higher	4(21.1)	11(57.9)	4(21.1)	
Smoking Status	No	71 (36.6)	98 (50.5)	25(12.9)	.593
	Yes	45 (41.7)	48 (44.4)	15(13.9)	
Regular Brushing Status	No	13 (18.3)	46 (64.8)	12 (16.9)	.000
	Yes	103(44.6)	100(43.3)	28(12.1)	
Frequency of Brushing	1-2 times a day	98(43.0)	103(45.2)	27 (11.8)	.015
	Less than 1-2 times a day	18(24.3)	43(58.1)	13(17.6)	
Dental Checkup Visitation Status	No	16 (34.8)	26 (56.5)	4(8.7)	.410
	Yes	100(39.1)	120(46.9)	36(14.1)	
Dental Treatment Status	No	20 (38.5)	26(50.0)	6(11.5)	.917
	Yes	96(38.4)	120(48.0)	34(13.6)	
Concerns about Dental Treatment	No	52(37.7)	63(45.7)	23(16.7)	.264
	Yes	64(39.0)	83(50.6)	17(10.4)	
Population	Dental Hospital	25(25.0)	58(58.0)	17(17.0)	.001
	Student	54(54.0)	37(37.0)	9(9.0)	
	Public	37(36.3)	51(50.0)	17(13.7)	
TOTAL	302(100)	116(38.4)	146(48.3)	40(11.3)	

P<0.01; χ^2 test

effects in not only the field of linguistics but also the fields of philosophy, clinical psychology, religion, mathematics, philosophy of life and health (12).

In dentistry, providing accurate information for determining the "tooth" perceptions of a person through metaphors would be a first step towards preventing oral and dental problems, which are prevalent public health problems. Although there are several studies about metaphors in the national and international literature, no study was found in the field of dentistry. This study aimed to use metaphors to reveal the perceptions of adult individuals regarding the concept of tooth and the factors that affect these perceptions.

The study revealed that the metaphorical concepts produced regarding the concept of 'tooth' had a broad spectrum. While explaining this concept, the participants used not only popular metaphors such as 'health, aesthetics and beauty" but also different metaphors such

as 'security force, White House and Evolution'. A total of 66 different metaphors were formed in the study, and these metaphors were mainly those that carried aesthetical and functional meanings.

34 metaphors with aesthetical meanings were formed and constituted 38% of all metaphors. 30 metaphors about the chewing function of teeth were created (46%), while 21 metaphors were formed about meanings related to multi-dimensional aspects (bio-psycho-social) (15.5%). Accordingly, the perception that the chewing function of teeth which is the main task of teeth in life has priority was dominant in the society. However, humans are social beings. The aesthetical aspects of teeth were also noticed to a significant extent in the society. However, it is important to provide oral and dental health trainings at early ages to raise awareness that teeth are not one-dimensional but important in multiple dimensions in people's lives and establish a general perception in the

society without individuals experience dental problems.

The metaphors that were produced were related to the factors that affect the life and thinking style of the person. Individuals in the age group of 18-25, women, those with higher educational levels, those who were not employed, those who brushed regularly and those who did not have a dental problem assigned aesthetical meanings to teeth more. On the other hand, individuals in the age group of 26-55, men, those with lower educational levels, those who were employed, those who did not brush regularly and those who had dental problems assigned functional meanings to teeth more.

In our study, it was determined that gender had a significant effect on perceptions on teeth. While women perceived teeth in the aesthetical sense by 71%, men perceived teeth in the functional sense by 80%. Hendrics et al. (1998) stated that physical attractiveness is more important for women than it is for men, and beauty is a concept that is always prioritized by women (13,14). Reventos (1998) stated that the importance paid by women on their own appearances has increased with modernization. It was even thought that a woman's indifferent towards aesthetical appearance may indicate a psychological problem (15,16). In the literature, aesthetics is assessed by the criterion of the 'golden ratio', which is known as the ideal ratio among depth, height and width. It is believed that a face and a body with the golden ratio is "beautiful, aesthetical"(17). This is why the results of this study supported the literature.

In our study, it was determined that the factor of age was significantly effective on tooth perceptions. While the individuals in the age group of 18-25 assigned more aesthetical meanings to teeth, those in the age group of 56-85 assigned more functional meanings to them. A study that was conducted in Turkey reported that the age interval with the lowest DMFT rates was 18-30 (5.68%), while the interval with the highest rates was 51-60 (10.96%) (18). In a study that was carried out with the method of urban-rural-based stratified cluster sampling by TURKSTAT (Turkish Statistical Institute), 3176 individuals were reached, and as a result of the study, the rates of missing teeth were found to be 2.6% in the age group of 35-44 and 48.0% in the age group of 65-74 (19). This result may be explained by the fact that young people have more active social lives. The increased rates of missing teeth in advanced ages were explained by the increase in functional needs.

In our study, we could not find a significant effect of income level on tooth perceptions. Previous studies showed the general coverage of oral healthcare services in adults as 35% in low-income countries, 60% in low-medium-income countries, 75% in medium-high-income countries and 82% in high-income countries (20). The reason for this was explained as those dental treatments are expensive, and they constitute 5% (21) of total public healthcare expenses and 20% of total out-of-pocket healthcare expenses (22). However, in our study in a provincial center in Turkey,

where the dental healthcare expenses of children at ages of 0 to 18, young people who are still in education and all individuals with social security are covered by the state, income level did not appear to be effective.

In contrast, according to our results, educational level was found to be effective on tooth perceptions. The participants who had lower educational levels produced more metaphors about chewing, which is the main function of teeth. This result suggested that awareness on the importance of teeth may be increased by education.

A good physical appearance would create a positive effect on communication among individuals who are active in their social lives. Harmonic position of teeth would provide an aesthetically pleasing smile. Such a smile plays a key role in social relationships. In our results, employment status was determined to be significantly effective on tooth perceptions. Individuals who were not employed attached aesthetical meanings to their teeth, while those who were employed preferred stated meanings more. Individuals who aim to reach their career goals need to pay the utmost attention to their bodily image. It is known that presentation of the body is important in the service sector. In addition to this, looking attractive is also important in professions with high respectability (23). Problems in teeth may negatively affect functions such as nutrition, chewing, tasting, laughing, smiling, sleeping and speaking. As a result of these, psychosocial outcomes such as weakened social relationships, shyness, loss of self-esteem, anxiety and depression may be experienced. There are studies in the literature which showed that those with an ideal dental structure are more advantaged in terms of finding jobs (24,25).

Not only is brushing important in terms of dental health, it also forms that basis of clean, white, odorless teeth and an aesthetically pleasing smile. In this study, the participants' status of brushing teeth was found to be significantly effective on their tooth perceptions. While those who brushed their teeth regularly produced metaphors that carried aesthetical meanings and metaphors that carried functional meaning to similar extents, those who did not brush their teeth regularly used images only referring to the functional characteristics of teeth. Similarly, those who brushed their teeth less frequently than 1-2 times a day produced metaphors that were only related to the function of teeth in higher rates. The aesthetical losses and bad breath that occur when teeth are not regularly brushed will prevent the individual from socializing. Oral and dental problems and loss of teeth are encountered in individuals who do not have the habit of brushing their teeth regularly. Nutritional problems are experienced based on missing teeth. Deficiency in chewing leads to systemic problems that affect the general health, and thus, the functional characteristics of teeth would become prioritized in the lives of such individuals. As another result of the study, in the part of the sample that included individuals who

visited the dental hospital with complaints of dental problems, metaphors about the functions of teeth were significantly more in numbers. Karaođlanođlu et al. (18) reported that age, brushing status and educational level were effective on dental problems, and age, gender and educational status were effective on brushing behaviors of individuals. These results were in agreement with the results of this study regarding brushing status.

CONCLUSION

Teeth are multifunctional body parts that are necessary for sustaining life. Dental problems do not directly threaten people's lives, but in addition to the function of chewing, individuals also experience speech-related and aesthetical problems. Hence, they will face such problems in the form of losses in their social lives and health problems. This is why dental health is an issue that affects the individual in multiple aspects. We believe that oral and dental health training programs to be offered at early ages will be effective in the production of metaphors with high levels of awareness on tooth perceptions by future generations.

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

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Gulhan Kocaman ORCID: 0000-0002-8920-2391

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