Atatürk Üniv. Diş Hek. Fak. Derg.
J Dent Fac Atatürk Uni
Cilt:26, Sayı:3, Yıl: 2016, Sayfa, 419-426

Araştırma/ Research Article

DİŞ HEKİMİ İLE İLGİLİ SİMGESEL GENEL KANI VE DİŞ HEKİMLİĞİ EĞİTİMİ BOYUNCA BU SİMGELERİN DEĞİŞİMİ: "DİŞ HEKİMİ ÇİZ TESTİ"NİN (DHÇT) UYGULANMASI

THE STEREOTYPICAL IMAGES OF A DENTIST AND HOW THEY CHANGE OVER TIME IN A DDS PROGRAM: APPLICATION OF DRAW A DENTIST TEST (DADT)

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Makale Kodu/Article code: 2647
Makale Gönderilme tarihi: 01.03.2016
Kabul Tarihi: 21.04.2016

ABSTRACT

Research in educational science showed that existing knowledge and perceptions play important role in learning of knew information. Stereotypical images of a dentist could give many hints to dental collages and dentist who are practicing.

Aim: The purpose of the study was to describe and document the stereotypical images of a dentist and then investigate the development of DDS's students' perception of a dentist during the five-year training.

Materials and Methods: Data was collected through dental students (N=214) drawings of themselves as a practicing dentist and other students (N=93) drawing of a practicing dentist.

Results: Results of the study showed that several stereotypical images existed in both groups drawings. The most common drawings were "patients lying, existence of equipment, and existence of light". Stereotypical images dental students hold show different patterns after preclinical training.

Conclusion: Within the limitations of this study it can be concluded that more exposure to the profession in early years of training is recommended for the dental students.

Keywords: Dentist, stereotypical images, perception, curriculum.

ÖZET

Eğitim bilimleri araştırmaları bireyin mevcut bilgileri ve algılarının yeni bilgilerin öğrenilmesinde önemli rol oynadığını göstermektedir. Diş hekimi ile ilgili simgesel genel kanı diş hekimliği fakültelerine ve diş hekimlerine birçok ipucu sağlayabilir.

Amaç: Bu çalışmanın amacı diş hekimi ile ilgili simgesel genel kanıları tanımlamak ve diş hekimliği fakültesi öğrencilerinin diş hekimi algılarının beş yıllık diş hekimliği programı boyunca nasıl değiştiğini incelemektir.

Gereç ve Yöntem: Veriler diş hekimliği fakültesi öğrencilerinin (N=214) kendilerini tedavi uygulayan bir diş hekimi olarak çizmeleri ve diğer fakülte öğrencilerinin (N=93) diş tedavisi gerçekleştiren bir diş hekimini çizimlerinden elde edilmiştir.

Bulgular:Çalışmanın sonucu her iki grupta da biçok simgesel genel kanıların yer aldığını göstermektedir. En yaygın çizilen simge "uzanmış hasta, mevcut tedavi ekipmanları, ve tedavi lambası" olmuştur. Diş hekimliği öğrencilerinin sahip oldukları simgesel genel kanı preklinik sonrası farklılık göstermektedir.

Sonuç: Bu çalışmanın sınırları dahilinde, öğrencilerin diş hekimliği eğitiminde daha erken yıllardan itibaren mesleki uygulamlara dahil edilmesini önermektedir.

Anahtar Kelimeler: Diş Hekimi, basmakalıp görüntüler, algı, müfredat.

INTRODUCTION

Research in educational science proved that existing knowledge or perception influence the new learning.[1,2] In another word, people construct the knowledge by integrating existing knowledge with the new learned one.[3] Therefore, it is important to know a person's existing knowledge and perception in order to improve new learning skills.

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There are several methods to reveal one's perception of a profession. One of the most common methods is structured survey method, which includes specific questions related to that specific profession. Surveys are usually administered as a written format. Another method is content analysis of published material related to a profession. One good example of the content analysis was conducted by Ehrle and Johnson [4] (1961) who analyzed the published cartoons of psychologists through collecting of about 5000 thousand cartoons published in magazines. Other than these methods, drawing becomes a very popular method to reveal perception of a profession and describe the stereotypical images of that profession.

The most popular drawing instrument was "Draw a Scientist Test" which was developed by Chambers [5] (1983) to assess perceptions of a scientist through drawing. Draw a scientist test was the most commonly used instrument to assess the stereotypical image of a profession and inspired other researchers to describe stereotypical images of other professions. Other similar instruments have been developed to measure students' perceptions of different professions, such as the "Draw-an-Archaeologist Test",[6] "Draw a Psychologist",[7] "Draw an Engineer",[8] "Draw an Environment"",[9] "Pupils' Images of Mathematician's"[10] and "Draw a Science Teacher Test".[11] The use of drawing instrument in different professions proved the effectiveness of this method for measuring people's perception of specific professions.

Stereotypical images are the mental images which were defined by Moseley (2010) as a key part of the repertoire of ways people make sense of their daily life experiences.[9] It was also claimed that such images could become an important part of the internal and external frames people use to understand the world around them.[9] People communicate through images and understand the surroundings with the help of the images.[8] Weber and Mitchell [12] (1995) reported that images were constructed and interpreted in attempts to make sense of human experience and to communicate that sense to others. It was also claimed that people not only created images, but also were shaped by them. Therefore, in order to better understand a profession, stereotypical images of that profession need to be understood and described clearly.

Discovering and describing the stereotypical images of a profession could give the decision maker many hints to plan the educational setting and construct the curriculums. For instance, stereotypical images of a scientist who are hold by the majority of the society could influence a person's careers choices.[13] Especially women and minorities do not pursue a career in science even though they are talented because of the negative stereotypical image of a scientist.[14] General image of a scientist is "Einstein" model who is a white male with messy hair and lab coat on him.[15] That image could possibly discourage females and some males to pursue careers in science-related professions such as medical and engineering jobs. Conversely, very asocial portrait of the scientist could have similar effect, too.

Although there was a study comparing the learning styles of dental students[16], no study in the literature described the stereotypical image of a dentist, any negative or positive effect of stereotypical images of a dentist could not be proposed. The importance of the current study was that the more the public awareness regarding a dentist is understood, the better the doctor of dental surgery (DDS) programs will be shaped and the quality of dental care will be improved. No research has investigated the stereotypical images of a dentist previously.

The study which investigated dental students' views about their dental education from an academic, social, and physical environment perspective, revealed that "students' perspectives should be taken into consideration in all discussion and decision regarding dental education" to train better dentists.[17] Therefore, it becomes very important to investigate DDS students' perception of their profession.

The purpose of the current study was to describe and document the *stereotypical* images of a dentist and then investigate the development of DDS students' perception of a dentist during the five-year training program. The following research questions *(RQ)* were investigated in the current study.

RQ1: What are the stereotypical images of a dentist among the DDS students and tudents from other faculties?

RQ2: How do DDS students' views about dentist change during the five year DDS training program?

MATERIALS AND METHODS

The article titled "The stereotypical images of a dentist and how they change over time in a DDS program: Application of Draw a Dentist Test (DADT)" was based on a field research conducted on students of Faculty of ……. of …… University by a data collection form. For this kind of researches, to obtain ethical committee approval was not an obligation, legally in ……. and institutionally in ……University.

Stereotypical images of a dentist were described in the first section. Both DDS students' and OTHER college students' views about a dentist were documented through a drawing instrument. A large group of DDS students and students from other colleges were asked to draw their images of dentist, and their drawings were analyzed systematically. The purpose of collecting data from both DDS and other students was to compare and contrast both groups' images. Both groups participated in the study were potential practitioners of the profession and/or have been potential patient.

Development of stereotypical images of DDS students was investigated in the second section. The research design was a cross-sectional research design. According to Cohen et al. [18] (2005) a cross-sectional study can be defined as follows: "A cross-sectional study is one that produces a 'snapshot' of a population at a particular point of time". The advantage of the cross-sectional study is that researcher could have a chance to collect data at different points during the DDS program instantly. Another advantage of cross-sectional design is that researchers do not have to wait for a long time to observe the changes in the participants over time. In addition, participants are not needed to be retested in cross-sectional design. Because of these advantages of the design, five groups of DDS students in their first, second, third, fourth, and fifth years of the program participated in the study.

Content and Participants

A total of 307 students, 214 students from college of dentistry and 93 students from other colleges, participated in the study. 12 of the participants' drawings (10 dental college students and 2 students from other colleges) were not included in the analysis because those could not be analyzed. The final study group included 204 DDS students and 91 other college students. Students from other colleges are represented as "OTHER" for rest of the paper for practical use of the words. Participants were students from a large-size research university in southern part of Turkey.

The participants start to DDS program after taking a nationwide university entrance exam following high school graduation. The study was conducted in one of the top ten public DDS schools of the country based on the university entrance exam results. Distribution of participants by gender and their major were presented in Table 1. Similarly; OTHER students attend to college after attending a nationwide university entrance exam followed by high school graduation.

Table 1. Distribution of participants by gender and their major.

Major	***Gender***		***Total***
	Female	*Male*	
DDS	*101*	*103*	*204*
OTHER	*63*	*28*	*91*
Total	***164***	***131***	***295***

Program Description

The DDS program is a 5-year program, which requires participants to have a high school degree first and pass the nationwide university entrance exam. DDS program in Turkey is one of the most popular programs, which many students want to be accepted. Therefore, very competitive students who score very high in math and science have a chance to be accepted. Table 2 shows the distribution of courses over the 5-year DDS training. As it could be seen from Table 2, clinical studies accumulate to last three years whereas the theoretical courses are offered in first two years. A total of 163 credit hours were required to obtain the DDS degree. The courses were offered in year based rather than the semester. An academic year in college of dentistry was 32 weeks long for the preclinical classes (first three years) and 42 weeks for the clinical classes (last two years).

Table 2 Weekly hours of courses offered in 5 year DDS program.

Year of study	General Common Courses[a]	Basic Medical Sciences	Basic Dental Sciences	Clinical Sciences (Dental and Medical)	Total
1st year	8	6	15		29
2nd year		19		12	31
3rd year		6	2	32	40
4th year			1	34	35
5th year				28	28
Total	8	31	18	106	163

[a] *Courses all college students has to take such as math, physics, chemistry, history, literature.*

Data Collection

Data was collected with an instrument developed by the authors and named "Draw a Dentist Test (DADT)". The DADT instrument was inspired originally by the Draw a Scientist Test which was developed by Chambers (1983) to assess children's perceptions of scientists through drawing. The stereotypical images presented in drawing were coded and the codes were used to evaluate participants' perception of a dentist.

Participants from DDS program were asked to draw themselves as a practicing dentist. They were also asked to provide as many details as possible in their drawings and write an explanation below the drawing if needed. Participants from OTHER group were asked to draw a practicing dentist and include details in an explanation paragraph as well. Most of the participants in both DDS and OTHER groups completed their drawings in an average of 5 to 15 minutes.

The advantage of this test was that unlike other paper-pencil tests, this test did not include any forced-choice (multiple-choice) items, which lead the participants. In addition, an interviewer effect on interviewee is not present in the drawing test.

Data Analysis

Data was analyzed by both researchers. Fist, both researchers investigated each drawing separately and assigned codes to images and written explanation below the drawings. After that, researchers come to an agreement to group some codes or eliminate from the coding list due to lack of relation to dentistry. After reaching a final coding list, each researcher coded the drawings again. The purpose of the second coding was both to confirm and disconfirm the first round of coding and to make sure that each and every one of the related stereotypical image was included in the coding list. Existence of each stereotypical image in the drawing was scored as "1" and a total score for each participant was generated by counting the total number of stereotypical images drawn by the participants. The researchers come to agreement on ten different codes so that the possible maximum score could be 10. SPSS 17.0 was used for the statistical analysis. Descriptive statistics, independent t-test, and ANOVA followed by Tukey HSD test were used for statistical analysis in the study (α=0.05).

RESULTS

Results of RQ1: What are the stereotypical images of a dentist among the DDS students and students from other faculties?

Investigation of drawings revealed that several stereotypical images existed in both groups' drawings and a coding list was generated. The coding list included 10 codes, which were present in both groups' drawings and presented in Table 3. Participants' drawings included varying details while some of them included very little details (Figure 1a, 1b), some of them were very detailed and included explanation in the drawing (Figure 1c). A sample drawing of a DDS student who included all the stereotypical images in his/her drawing was presented in Figure 1d which included all ten stereotypical elements of image either as a drawing or an explanation word.

Table 3. Stereotypical images and their percentages of existence in drawing for DDS and OTHER students.

DDS students	%	OTHER students	%
Patient Lying	93,1	Patient Lying	95,6
Existence of Equipment	53,9	Existence of Equipment	69,2
Existence of Light	48,0	Existence of Light	52,7
Dentist Sitting	41,2	Dentist Sitting	3,3
Dentist Wearing Mask	20,1	Dentist Wearing Mask	15,4
Dentist Wearing White Coat	17,6	Dentist Wearing White Coat	95,4
Existence of Assistant	15,7	Existence of Assistant	2,2
Dentist Wearing Glass	11,8	Dentist Wearing Glass	3,3
Existence of X-ray	6,9	Existence of X-ray	1,1
Dentist Wearing Gloves	5,9	Dentist Wearing Gloves	0,0

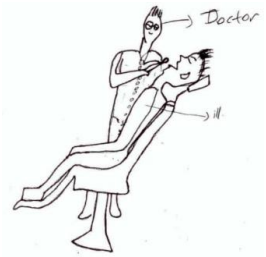

Figure 1a

Figure 1b

Figure 1c

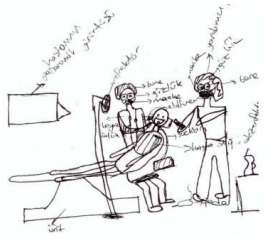

Figure 1d

Figure 1. Sample drawings from participants' drawings of dentist.

Comparison of DDS students' total drawing scores with OTHER students' scores showed a statistically significant difference between DDS students (3.14±1.86) and OTHER students (2.48± 0.95) total drawing scores. Therefore, it would be more logical to describe each group's stereotypical images separately.

Based on Table 3, stereotypical images of DDS students showed different patterns compared to the OTHER students. When stereotypical images were listed from most frequently drawn to least frequently drawn images for DDS students as it was shown in Table 3, "Patient Lying," "Existence of Equipment," and "Existence of Light," and "Dentist sitting" were the most frequently drawn images. The percentage of other images was 20.1 and below for DDS group.

List of most frequently drawn images by OTHER students showed that "Patient Lying", "Dentist Wearing White Coat", "Existence of Equipment" and "Existence of Light" were the most frequently drawn images.

There were two impressing differences between two groups; 1) DDS students tended to draw dentist in a sitting position (41.2 %) while only very few of OTHER students draw dentist in a sitting position (3.3 %), 2) DDS students did not draw dentist wearing a white coat frequently (17.6 %) while almost all of the OTHER students draw dentist wearing a white coat (95.4 %).

The independent sample t-test results showed that there were no statistically significant differences between DDS students and OTHER students for drawing of "Patient Lying", "Existence of Light", and "Existence of Mask" as it was shown in Table 4. However, there were significant differences between DDS students and OTHER students' for drawing "Existence of Equipment, Dentist Sitting, Dentist Wearing White Coat, Existence of Dental Assistant, Personal Protection Equipment such as Dentist Wearing Glass and Gloves, Existence of X-ray, and Dentist Wearing Gloves".

Table 4. Independent sample t-test results of images between DDS and OTHER students.

Images	***T***	***Df***	***Sig.***
Patient Lying	*-0,82*	*293,00*	***0,42***
Existence of Light	*-0,75*	*293,00*	***0,46***
Existence of Mask	*0,96*	*293,00*	***0,34***
Existence of Equipment	*-2,48*	*293,00*	*0,01*
Dentist Sitting	*7,11*	*293,00*	*0,00*
Dentist Wearing White Coat	*2,82*	*293,00*	*0,01*
Existence of Assistant	*3,41*	*293,00*	*0,00*
Dentist Wearing Glass	*2,34*	*293,00*	*0,02*
Existence of X-ray	*2,09*	*293,00*	*0,04*
Dentist wearing gloves	*2,38*	*293,00*	*0,02*

Results of RQ2: How do DDS students' views about dentist change during the five year DDS program.

One way ANOVA results of the total drawing scores showed that there was a statistically significant difference between different year DDS students ($p<0.0001$). Posthoc test (Tukey HSD) was run to discover the specific differences when pairwise comparisons were made between the classes. Results showed that the average score from the drawings of 3rd year students (4.64±2.4) were statistically significantly higher than the scores of the first (2.33±1.41), second (3.17±1.43), and fifth-year students (3.15±2.31). That finding is in accordance with the courses taken on 3rd year of dental college education, which are mainly related to dental profession. In the 1st and 2nd year of dental education, many courses were on general culture and premedical classes. Although the mean score of the 3rd year students was higher compared to the 4th year students

(3.54±1.95), the difference was not statistically significant (p=0.183). There was no statistically significant difference between the mean scores of 1st, 2nd and 5th year students (p=0.291). Similarly, there was no statistically significant difference between the scores of 2nd, 4th and 5th year students (p=0.902). The mean scores of both 3rd year and 4th year students were significantly higher than the mean score of 1st (p<0.0001 and p=0.026, respectively) year students. The mean score of 3rd year students were also statistically higher than the mean score of 5th year students (p=0.032). Post-hoc test results and descriptive statistics were presented in Table 5.

Table 5. Descriptive statistics of DDS students' scores for each class and Post-hoc comparison of total scores by years.

Class	***N***	***Mean***	***Std. Deviation***	
First Year	*58*	*2,33*	*1,41*	*A**
Second Year	*70*	*3,17*	*1,43*	*A,B*
Third Year	*22*	*4,64*	*2,4*	*C*
Fourth Year	*28*	*3,54*	*1,95*	*C,D*
Fifth Year	*26*	*3,15*	*2,31*	*A,D*
Total	***204***	***3,14***	***1,86***	

**Different capital letters show statistically significant differences*

Stereotypical images drawn by DDS students were presented in Table 6. "Patient lying" was the most frequently observed image for all classes of dental college. Third year students showed highest percentages of images in 6 categories (patient lying, dentist sitting, dentist wearing mask, dentist wearing white coat, dentist wearing glass, dentist wearing gloves), which indicated that during 3rd year of dental education students showed a drastic change on their views of a dentist. In addition, wearing mask and glasses were observed most commonly in third years' drawings which indicated that DDS students have high concern about their safety during the practice. Fourth year students scored highest in "*existence of equipment, existence of light, and existence of* ***X****-ray"* which indicated that DDS students attention is mostly on dental apparatus in forth year. Fifth year DDS students scored the highest percentage in "*existence of assistant"* which indicated that students are aware of working four handed.

Table 6. Percentages of stereotypical images drawn by DDS students by the years of study.

Stereotypical Images	***1st year***	***2nd year***	***3rd year***	***4th year***	***5th year***
Patient Lying	*93,1*	*97,1*	*100.0*	*82,1*	*88,5*
Existence of Equipment	*36,2*	*64,3*	*59,1*	*71,4*	*38,5*
Existence of Light	*29,3*	*55,7*	*50.0*	*64,3*	*50.0*
Dentist sitting	*31.0*	*27,1*	*68,2*	*57,1*	*61,5*
Dentist Wearing Mask	*12,1*	*20,0*	*45,5*	*17,9*	*19,2*
Dentist Wearing White coat	*12,1*	*22,9*	*36,4*	*14,3*	*3,8*
Existence of Assistant	*6,9*	*21,4*	*18,2*	*3,6*	*30,8*
Dentist Wearing Glass	*6,9*	*0.0*	*50.0*	*21,4*	*11,5*
Existence of X-ray	*1,7*	*5,7*	*9,1*	*17,9*	*7,7*
Dentist Wearing Gloves	*3,4*	*2,9*	*27,3*	*3,6*	*3,8*

DISCUSSION

RQ1: What are the stereotypical images of a dentist among the DDS students and students from other faculties?

Students in both groups hold stereotypical images of a dentist in their drawing as it was shown in other professions such as psychologist, scientist, teacher, and archeologist. Participants' drawing of a dentist included 10 stereotypical images. Stereotypical images drawn by DDS students and OTHER students were very common but the frequency of drawing of a specific image was varying based on the groups. DDS students tended to draw what they use in their profession while OTHERS tend to draw what they observe during dental treatment.

The most frequently drawn image by both groups was a lying patient. Both groups draw patient in lying position, which indicated that dentistry is perceived as a practice conducted with a patient in lying position. There were no sitting patient who could be indicating a conversation between the patient and the dentist.

The second most frequently drawn images by DDS students and OTHER students were the existence of equipment and a dentist wearing a white coat, respectively. This result indicated that practitioners

tend to draw the equipment they use while the others draw what they observe. Similarly, DDS students draw a dentist in a sitting position while the others draw a dentist as standing. Dental ergonomics instruct dentist to sit while operating.

Significant differences between the frequency of DDS students and OTHERS indicated that the stereotypical image of a dentist is different for DDS students compared to the students of other profession. Three images (mask, light and a lying patient) were the common images for both groups. Existence of other images varied according to the groups.

A slightly different result was reported in a study reported by AlSarheed (2011) who found that children (9-12 years old) perception of a dentist is focused on white coat, mask, and protective eyeglasses during treatment.[19] DDS students' drawings in current study focus on existence of white coat; mask and protective glass were less than %20 among the other stereotypical images. However, OTHER students' drawings focused on white coat as second most frequently drawn images. Although there was a difference between AlSharheed study and DDS students' drawings in the current study, but there was a similarity between AlSharheed study and OTHER students' drawings. Participants who were not from dental field draw similar images.

RQ2: How do DDS students' views about dentist change during the five-year DDS program.

Although there were some differences between DDS and OTHER student's scores, the difference was more drastic between the different years of DDS training program. The important point is that students in 3rd year showed an extraordinary pattern than the other years. 3rd year students had the highest frequencies in many images which indicated that 3rd year was a breaking point for DDS education. This could be because the participants were almost fully exposed to clinical studies in 3rd year and they were very eager to learn and reflect their learning and observation to their drawing. It is important to stress that 3rd year is the last year of the preclinical classes. Students who successfully pass the 3rd year are eligible to take clinical courses and start treating patients. Therefore, 3rd year dental students are highly interested in their profession.

First year students' drawings showed the lowest scores for the stereotypical images in many categories among the DDS students. That was an expected outcome because they had not been exposed to the profession, yet.

Surprisingly, the frequency of some images like existence of equipment, mask, white coat, protective glass decreased in drawings of 5th year dental students" Since the 5th year students spent most of their time in the clinic and use equipment very frequently, they get used to the equipment and focused on other properties such as sitting position, existence of assistant and light. It could be concluded that they were having hard time to get used to sitting position, existence of assistant, operating light.

Last year students draw assistant more frequently than the other years which indicated that they saw or get help from the assistant while practicing.

Fourth and fifth year dental students tend to draw light which indicated that they were trying to get used to using lamp in clinic.

The limitation of the current study was that the participants were chosen among the college students and DDS students. The sample is considered an educated group of people so that their drawings reflect the point of college students. Additional data needs to be collected from other age groups. The effect of different education levels should be taken account to evaluate the perception of a dentist.

CONCLUSIONS

Within the limitations of this study, findings of this study can be concluded as;

1. More exposure of the dental students to the profession is necessary in the early years of dental training. Therefore, addition of professional courses or observation in the clinic should be included in early years.
2. Although there was not a significant difference between DDS students and the OTHER students for general and commonly accepted parameters (patient lying, existence of light, existence of mask), there were statistically significant differences for more specific parameters (existence of equipment, dentist sitting, dentist wearing a white coat, existence of a dental assistant, dentist

wearing protection glasses, existence of X-ray, dentist wearing gloves).

KAYNAKLAR

1. Koballa TR Jr, Glynn SM. Attitudinal and Motivational Constructs in Science Learning. In: Abell SK, Lederman NG (eds) Handbook of Research on Science Education. New Jersey; Lawrence Erlbaum: 2007. p. 75-102.
2. Papanastasiou EC, Zembylas M. Differential effects of science attitudes and science achievement in Australia, Cyprus, and the USA. International Journal of Science Education 2004;26:259-80.
3. Gilbert JK, Osborne J, Fensham P. Children's science and its consequences for teaching. Science Education 1982;66:623-33.
4. Ehrle RA, Johnson BG. Psychologists and cartoonists. American Psychologist 1961;16:693-5.
5. Chambers DW. Stereotypic images of the scientists: the draw-a-scientist test. Science Education 1983;67:255-65.
6. Renoe P. The Draw-an-Archaeologist Jest: A Good Way to Get the Ball Rolling. Science Activities: Classroom Projects and Curriculum Ideas 2003;40:31-6.
7. Rosemary B. Determining stereotypical images of psychologists: the Draw a Psychologist Checklist. College Student Journal 2000;34:123-33.
8. Knight M and Cunningham C. Draw an Engineer Test (DAET): Development of a tool to investigate students' ideas about engineers and engineering. Proceedings of the 2004 American Society for Engineering Education Annual Conference and Exposition. Salt Lake City, Utah. 2004
9. Moseley C, Desjean-Perrotta, Utley J. The Draw-An-Environment Test Rubric (DAET-R): exploring pre-service teachers' mental models of the environment. Environmental Education Research 2010;16:189-208.
10. Picker SH and Berry JS. Investigating pupils' images of mathematicians. Educational Studies in Mathematics 2000;43:65-94.
11. Thomas JA, Pedersen JE, Finson KD. Validating the draw a science-teacher test checklist: exploring mental models and teacher beliefs. Journal of Science Teacher Education 2001;12:295-310.
12. Weber S, Mitchell C. That's funny, you don't look like a teacher. Interrogating images and identity in popular culture. London; The Falmer Press: 1995. p. 21.
13. deMeis L, Machado RCP, Lustosa P. Soares VR, Caideira MT, Fonseca L. The stereotyped image of the scientist among students of different countries: evoking the alchemist? Biochemical Education 1993;21:75-81.
14. Baker D and Leary R. Letting girls speak out about science. J Research Science Teaching 1995;32:3-27.
15. Eisenhart M, Finkel E, Marion S. Creating the conditions for scientific literacy: A re-examination. American Educational Research Journal 1996;33:261-95.
16. Kazancı F, Kazancı EE, Memduhoğlu HB, Sevimli Ş. Tıp ve diş hekimliği fakültesi öğrencilerinin öğrenme stillerinin karşılaştırılması. Atatürk Üniv. Diş Hek Fak Derg 2014;24:67-73.
17. Divaris K, Barlow PJ, Chendea SA, Cheong WS, Ntounis A, Dragan IF, Hamlin J, Hosseinzadeh L, Kuin D, Mitrirattanakul S, Mo'nes M, Molnar N, Perryer G, Pickup J, Raval N, Shanahan D, Songpaisan Y, Taneva E, Yaghoubzadeh S, West K, Vrazic D. The academic environment: the students' perspective. European Journal of Dental Education 2008;12:120-30.
18. Cohen L, Manion L, Morrison K. Research methods in education. New York; Taylor & Francis e-Library: 2005. p. 175.
19. AlSarheed M. Children's Perception of Their Dentists. European Journal of Dentistry. 2011;5:186-90.

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