



## Students' views about disease concept: Drawing and writing technique

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Received 21 Sept., 2015

Revised 31 Oct., 2017

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### Abstract

This study was aimed to determine ninth grade students' views about disease concept by a drawing and writing technique. Participants consisted of 81 ninth grade students in a Technical and Industrial Vocational School in Kocaeli, Turkey. The study was conducted in spring semester of 2009-2010 academic year after Health Concept Unit in Health Education Course had been taught in fall semester of 2009-2010 academic year. Data were collected by questionnaire including drawing and writing technique.



Data were analyzed by using descriptive and content analyses techniques. Data about disease concept were categorized under eight themes: Disease names, disease causes, disease consequences, disease prevention, mental health, figures about the definition of disease, objects defining disease, and others. Although the students described mostly the concepts of microbe, fatigue, body, bad, harm, and health related to disease concept, the students drew mostly the figures of face, human beings, sickbed, and redness related to disease concept. However, the students mentioned mainly about physical dimension of disease concept in their explanations related to definition of disease concept rather than psychological dimension of disease concept.

**Keywords:** Disease concept, Health concept, Drawing-writing technique, Secondary education

## Introduction

Creating a healthy society is possible with healthy individuals. Whether the individuals are healthy or not depends on various individual and behavioral properties and especially the due importance given to health and disease (Tekin, 2007). Health which was defined in 1948 by World Health Organization (WHO) and is still valid nowadays is below: “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” Disease concept is defined in various ways. For instance, disease means “Cells, tissues or body organs of human beings can't function properly or the functioning of these is impaired” (Berker, 2008, p.75). Disease means “physiological tasks cannot be performed or mental health deteriorates as a result of the emergence of a number of changes in organism” (Sert, Kibaroglu, Şenyüz and Ünsal, 2008, p.1). Or disease reveals itself with the changes in physical, mental or social functions as it is conceptualized as a state which ruins the flow of usual conditions and daily life (Candansayar and Coşar, 2001). In brief, disease can be defined as the state of physical, mental or social not well-being.

Although individuals define health and disease concepts in various ways, a collective consciousness has to be created. The thoughts individuals have about the disease concept affect their behaviors related to health and disease, their health consciousness and their risk perceptions (Piko and Bak, 2006). Therefore, it is important to determine individuals' ideas about disease.



First we must define concept before determining individuals' views about disease. Concept is 'an abstract and general notion of an object or a thought in mind' (Turkish Language Association). As concept is defined in various researches, it has been defined as 'the abstract units in the thought system of individuals' (Saka and Ayas, 2002); as the generalization of the similarities with reference to the similarities and differences that state the common properties of different objects and phenomena (Yörek, 2007). Concepts that facilitate interpersonal communication also take place in mind as schemata. These schemata called image is personal and everybody can form various images related to a particular concept (Atasoy, Kadayıfçı and Akkuş, 2007). Learning the ideas individuals develop about a concept is also quite important in terms of the new experiences that will be developed related to that concept.

How abstract concepts such as health and disease are explained in mind is quite important for determining the ideas about these concepts. In order to determine students' views about disease and causes and treatment of the disease, the cognitive structures of the students have to be revealed (Vacik, Nagy and Jessee, 2001). The place in which knowledge is structured and learning process is actualized cognitively for students is human memory. In the researches on cognitive psychology, it is stated that human memory consists of two memories as 'short term memory' or working memory and 'long term memory' (Baddeley, 1992). It is thought that cognitive structure develops in the long term memory of the students. Cognitive structure is represented with words, concepts, rules and abstract ideas and their meanings, their implications, relations among them and organized figures (Tulving, 1993). In the process of developing this structure; properties such as students' knowledge, experiences, how students organize the knowledge, their perceptions, their ideas and their interaction with environment are actively used (Bağcı Kılıç, 2001; Dikmenli, 2010a; Dikmenli, 2010b; Durmuş, 2001; Şimşek, 2004).

Alternative techniques such as questionnaire, interview, concept map, fortune lines, word association and drawing and writing are used in order to determine the students' thoughts, comprehension or attitude towards a particular topic (Bahar, Özel, Prokop and Uşak, 2008; White and Gunstone, 1992). The drawing and writing is a technique which is used to find out the students' learning in depth. This technique is a very useful technique to acquire natural and high quality data about students' thoughts, comprehension and attitudes which remained hidden in the research process (Pridmore and Bendelow, 1995; White and Gunstone, 1992).



Drawing technique is more efficient since it is easily internalized and it is more effective in comparison with the techniques such as writing and behavior scales which focus on thought, comprehension and attitude changes since it is more useful in terms of time and provides various data (Atasoy, Kadayıfçı and Akkuş, 2007). Moreover, it is preferred because of the fact that it is an enjoyable technique and it is an activity in which children at all ages participate (Backett-Milburn and McKie, 1999).

Some of the works by drawing and writing technique are related to these subjects; cell division (Dikmenli, 2010a); heart (Bahar et al., 2008); passive smoking (Woods, Springett, Porcellato and Dugdill, 2005); happiness and sadness (Jolley, Fenn and Jones, 2004); violence (Yurtal and Artut, 2008); germ (Saka and Ayas, 2002); health (Çetin et al., 2013); disease, health (Piko and Bak, 2006); healthy school (Macgregor, Currie and Wetton, 1998); health education (Backett-Milburn and McKie, 1999); water cycle, environment (Dove, Everett and Preece, 1999); environment (Taşkın and Şahin, 2008); internet (Ersoy and Türkan, 2009); air pollution (Pluhar, Piko, Kovacs and Uzzoli, 2009).

When we have a look at the literature concerning the thoughts of the individuals about disease concept and the meanings given to disease concept, it is clearly seen that there are a lot of researches on this subject. Some of these researches were conducted by explanation and/or drawing techniques (Natapoff, 1978; Onyango-Ouma, Aagaard-Hansen and Jensen, 2004; Piko and Bak, 2006). In researches, disease is defined in various concepts: Asthenia, pollution, terrible, patient, being sad (Natapoff, 1978); pain, feeling bad, fatigue, headache, sore throat, sad, angry (Onyango-Ouma et al., 2004); bacteria, virus, cigarette, alcohol, air pollution (Piko and Bak, 2006); being unhealthy, inadequacy of sanitary measures and inadequacy in carrying out the things considered necessary (Boruchovitch and Mednick, 1997). On the other hand, it has been observed that these concepts are mostly drawn in the drawings related to the disease concept: Dead fish, snake, bicycle, dirty environment, contaminated food, dirty dishes (Onyango-Ouma et al., 2004); cigarette, polluted air, car, chicken pox, bacteria, dirty water (Piko and Bak, 2006).

As a result, even if there are many studies about drawing and explanations as stated above, any study concentrating on describing of drawing and writing about illness has not come across in Turkey. Therefore this study has been conducted to determine thoughts of ninth grade students towards illness concept by means of



drawing and writing technique. The results of the study were considered to be significant in contributing knowledge to the literature.

### ***Purpose of the Study***

The purpose of this study was to determine ninth grade students' views about disease concept by a drawing and writing technique.

Three research questions guided this study:

1. What are the students' explanations about disease concept?
2. What are the students' drawings about disease concept?
3. Do the students' explanations and drawings about disease concept support each other or not?

## **Methodology**

This study is descriptive in nature and qualitative research methodology. Qualitative methodology was used to address the research questions (Büyüköztürk et al., 2013).

### ***Participants***

The study was conducted in spring semester of 2009-2010 academic year after Health Concept Unit in the Health Education Course that was one hour a week, had been taught in fall semester of 2009-2010 academic year. Participants consisted of 81 ninth grade students (46 male and 35 female) in three classrooms in a Technical and Industrial Vocational School in Kocaeli, Turkey. Participants were selected by using by convenient sampling method, which is one of purposeful sampling methods (Büyüköztürk et al., 2013). The questionnaire was filled by 81 volunteer students.

### ***Data Collection and Data Analysis***

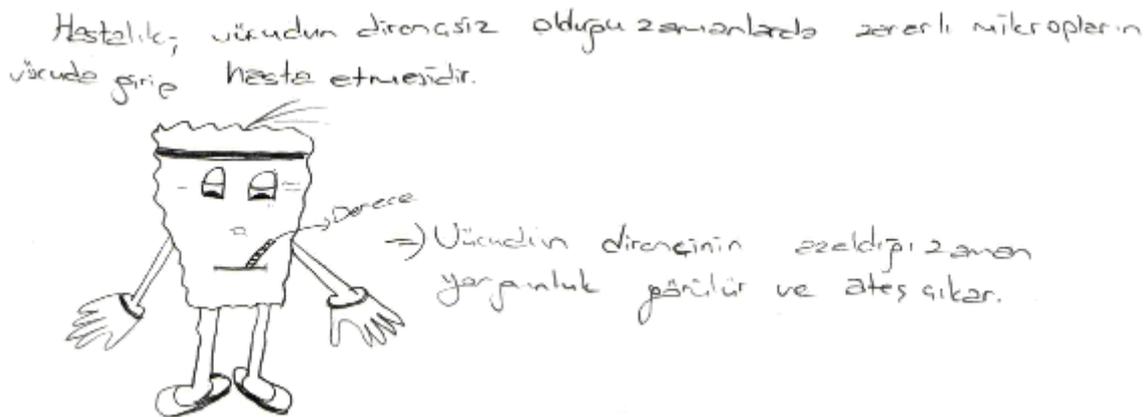
In this study, the drawing and writing techniques were used to determine students' views about disease concept. This technique is one of the significant techniques frequently used to reflect students' views (Rennie and Jarvis, 1995; Çetin et al., 2013).



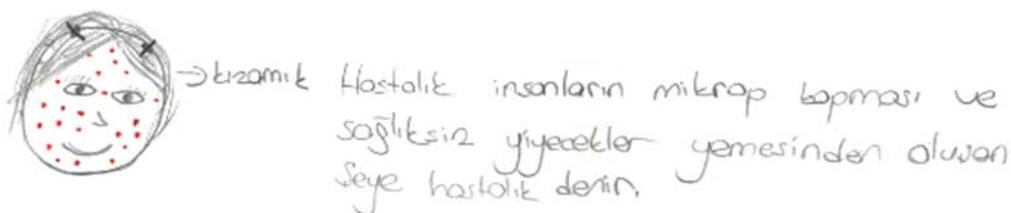
The students were asked to respond a questionnaire including “What is disease? Explain and draw.” on A4 sheet in 5 minutes. They were told that it was not an exam but an explorative activity. Students were explained that it was important to complete the task on their own. The students were given a short period to complete drawing and writing activity in order to prevent them from cheating. Also, the students were told to express their thoughts openhandedly and should not restrict themselves.

Data were analyzed based on descriptive and content analysis techniques (Yıldırım and Şimşek, 2006). Content analysis is conducted “to discover the concepts and relations that will be able to explain data. Therefore, data that are similar to each other are categorized within the frame of particular concepts and themes and they are organized and interpreted in a way that the reader can understand the data” (Yıldırım and Şimşek, 2006, p. 227).

Before starting data analysis, the students' answer sheets were numbered from 1 to 81. Example of three answer sheets of the students has been presented in Figures 1-3.

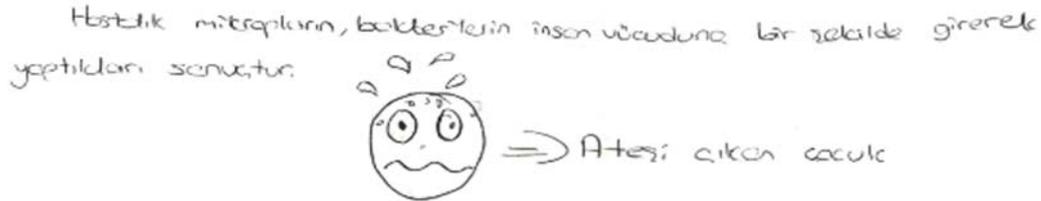


**Figure 1.** Answer sheet of S9 (Illness is the germ's making someone sick by penetrating into the body when it the body is resistless. When the resistance of the body decreases, fatigue and high fever are observed.)





**Figure 2.** Answer sheet of S60 (Measles. Catching an infection and the condition in which you eat unhealthy food are named as illness.)



**Figure 3.** Answer sheet of S48 (Illness is the result of germs and bacteria through their getting into the body somehow. A boy with fever.)

Explanations and drawings about disease concept in each answer sheet were analyzed separately by the authors of the article. Firstly the student's explanations about the definition of disease concept were categorized under specific themes and sub-themes for the explanation part. Students' drawings about the definition of disease concept were also analyzed similarly. After comparing the results of the analysis, the authors came to an agreement. Thus, the internal consistency of the themes and sub-themes created in the study was achieved by the authors of the article. Themes and sub-themes were checked many times by the authors. Then, the final version of it was obtained (see Table 1).

In addition, remarkable students' explanations about disease were given in the text by making same quote into "... " by student number in the text such as S21 and S66. Examples have been presented to drawings of students related to disease by indicating student number too.

## Results

This section includes the findings from the descriptions and drawings about the students' concept of disease. Theme and sub-themes frequencies of ninth grade students' explanations and drawings about disease concept are given in Table 1. As seen in the Table 1, the explanations and drawings of the students were being gathered under eight themes for defining disease concept. Four themes were common.



**Table 1.** Frequencies of the students' explanations and drawings about disease concept according to themes and sub-themes.

Theme	Sub-theme	Explanation (f)	Drawing (f)
Disease names	Measles	4	-
	Flu	2	-
	Cold	2	-
	Cancer, tumor	2	-
	Chicken pox	1	1
	Diabetes	1	-
	Total	12	1
Disease causes	Microbe	25	-
	Malnutrition	5	3
	Bacteria	4	-
	Virus	3	-
	Food, beverages	3	-
	Cigarette, alcohol	2	4
	Dirty environment	2	3
	Cold	1	-
	Total	45	10
Disease consequences	Fatigue	19	-
	Sick	6	-
	Contagious	5	-
	Death	4	-
	Pain	2	-
	Disability	1	-
	Problem	1	-
	Sneeze	-	3
	Tear	-	2
	Sweat	-	1
Total	38	6	
Disease prevention	Doctor	3	2
	Sports	3	1
	Hospital	2	3
	Medicine	1	2
	Balanced nutrition	1	-
	Hygiene	1	-
	Sun	-	1
	Total	11	9
Mental health	Bad, harm	13	-
	Unhappiness	1	-
	Total	14	0
Figures about disease	Face	-	68
	Human beings	-	57
	Redness	-	9
	Black hearth	-	1
	Alien figure	-	1



	Total	0	136
Objects defining disease	Sickbed	-	23
	Thermometer	-	6
	Tissue	-	2
	Mask	-	2
	Gun	-	2
	Slippers	-	1
	Glasses	-	1
	Water	-	1
	Faded flower	-	1
	Total	0	39
Others	Body	14	-
	Health	12	-
	Organ	4	-
	Organelle	3	-
	Life span	3	-
	Cell	1	-
	Total	37	0

### Explanations about Disease Concept

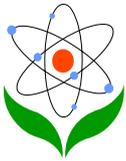
According to Table 1, the students' explanations about disease concept were categorized under six themes: Disease names ( $f=11$ ), disease causes ( $f=45$ ), disease consequences ( $f=26$ ), disease prevention ( $f=11$ ), mental health ( $f=14$ ), and others ( $f=37$ ). When the students' explanations about disease concept were analyzed, it was observed that the students used mostly the following concepts: Microbe ( $f=25$ ), fatigue ( $f=19$ ), body ( $f=14$ ), bad/harm ( $f=13$ ), and health ( $f=12$ ).

Disease is a state of physical, mental or social not well-being. When the students' explanations about disease concept were analyzed, it was observed that the students referred mainly physical dimension of disease concept in their explanations by indicating fatigue, sick, contagious, death, pain, disability, and problem. However, they also mentioned about psychological dimensions of disease concept by indicating bad, harm and unhappiness concepts.

Some students related disease concept with disease names. For instance,

*“Disease means catching microbe or influenza.” (S67)*

*“Disease is a thing that people never get rid of. Things such as flu, cold, diabetes.” (S10)*



*“Disease is an epidemic in a living being. There are diseases such as cancer, measles and so on. Disease results from microbe.” (S30)*

A lot of students made a relationship between disease concept and disease causes, especially with microbe, bacteria and virus. For instance,

*“... Disease means having a microbe bath ...” (S1)*

*“Disease is an incident that is spread to people through microbes.” (S2)*

*“Disease means that people are captured by microbes.” (S34)*

*“Disease is a result that microbes and bacteria formed after entering the human body in some way.” (S48)*

*“Disease means that harmful microbes enter the body when the body is resistless and infect human beings ...” (S9)*

*“Disease is that harmful bacteria enter the body and makes people weak.” (S8)*

*“Disease is that a kind of virus affects the body.” (S16)*

*“If the resistance of the body is broken, you get ill. If you don't stay away from the places with microbe, you get ill again.” (S59)*

Some students associated disease concept with irregular nutrition, catching cold and inadequate exercise. For instance,

*“People get ill if they don't eat well in a diet. People may be infected by things such as catching cold.” (S39)*

*“Disease is a thing such as measles that people go through clearly or unclearly or is a thing that results from malnutrition and inadequate exercise.” (S73)*

Some students also explained disease concept by associating it with microbe and nutrition. For instance,

*“Disease is a thing resulting from the fact that people eat unhealthy food and catch an infection.” (S60)*



*“People or living beings that don't eat healthy food and live together with microbes get ill.” (S61)*

*“Disease comes into existence in people who don't have a balanced diet and don't take care of themselves and disease occurs in people who catch an infection.” (S53)*

Some students associated disease concept with problem in body and pain. For instance,

*“Disease is a factor that harms people and affects their health.” (S69)*

*“... Disease is problem in a human body ...” (S63)*

*“Disease is a kind of ailment which is spread by other human beings or comes into existence spontaneously.” (S22)*

*“Disease means that a human being is very weak and his health is in a bad condition.” (S58)*

*“... Disease is that organs and organelles in the body of a living being work above normal in a way that will affect the body ...” (S25).*

*“Disease is a bad thing that sometimes makes people have headache and sometimes makes people suffer.” (S42)*

*One student had misunderstanding about disease concept:*

*“Disease is organelles occurred by harmful cells.” (S71)*

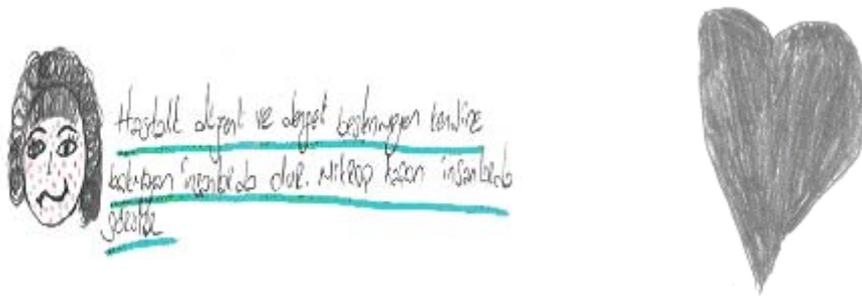
### ***Drawings about Disease Concept***

According to Table 1, the students' drawings about disease concept were categorized under six themes. They were: Disease names (f=1), disease causes (f=10), disease consequences (f=6), disease prevention (f=10), figures about disease (f=136), and objects defining disease (f=40). It was observed that the students drew mostly the following figures: Face (f=68), human beings (f=57), sickbed (f=23), and redness (f=9).



When the students' drawings about disease concept were analyzed, it was observed that students referred only physical dimension of disease concept in their drawings such as sneeze, tear, sweat, and sports.

Samples of the students' drawings about disease concept are presented in Figures 4-13.



**Figure 4.** A girl with chicken pox (S53) **Figure 5.** A black hearth (S16)



**Figure 6.** A sneezing girl and tissue (S21)



**Figure 7.** Dirty environment. Dry tree, garbage, garbage, garbage" (S80)



**Figure 8.** A sick and upset boy, sickbed and thermometer (S66)



**Figure 9.** A faded flower. It is sick (S62)



**Figure 10.** A sick and upset child, pill and water (S24)



**Figure 11.** An upset face (S1)



**Figure 12.** Hospital and human beings (S31)



**Figure 13.** A sick face and thermometer (S12)

## Discussion and Conclusions

This study aimed at determining ninth grade students' thoughts about disease concept by using the drawing and writing technique. All students' explanations and drawings about disease concept were categorized under eight themes: Disease



names, disease causes, disease consequences, disease prevention, mental health, figures about disease, objects defining disease, and others.

Four themes were common: Disease names, disease causes, disease consequences and disease prevention. The themes of mental health and others were only used in explanations about disease concept, though the students used the themes of figures about disease and objects defining disease only in their drawings. Although the students described mostly the concepts of microbe, fatigue, body, bad/harm, and health related to disease concept, the students drew mostly the figures of face, human beings, sickbed, and redness related to disease concept. Common concepts in the students' explanations and drawings about disease concept were the concepts of chicken pox, malnutrition, cigarette, alcohol, dirty environment, doctor, sports, hospital, and medicine.

Furthermore, the students explained disease concept as the concepts of disease, microbe, body, bad/harm and health for disease concept, even though they drew figures such as sullen face, sickbed and redness. The students mainly mentioned about physical dimension of disease concept in their explanations related to definition of disease concept rather than psychological dimension of disease concept by indicating bad, harm and unhappiness concepts.

Present study results were confirmed by some of the research results in literature (Bckett and Davidson, 1992; Boruchovitch and Mednick, 2002; Natapoff, 1978; Onyango-Ouma et al., 2004). For example, mostly these concepts were found out in the drawings about disease concept: Dead fish, snake, bicycle, dirty environment, contaminated food, dishes, pain, feeling bad, fatigue, headache, sore throat, upset, angry (Onyango-Ouma et al., 2004); infirmity, pollution, terrible, sick, being sad (Natapoff, 1978); bacteria, virus, cigarette, alcohol, car, air pollution, dirty water, chicken pox (Piko and Bak, 2006).

Although technological advancements contribute to solving a lot of problems related to health, old and new health problems and some kinds of disease are still fought against. Therefore, it is very important to determine students' perception level of disease concept in that it will help Health Education given to individuals turn into behavior. Moreover, the fact that individuals become more conscious about the topics such as kinds of disease, disease symptoms, disease prevention will enable them to live a more healthy life.



In today's world in which modern approaches replace traditional education approach, a student-centered approach is used (Özden, 2009). Students' knowledge structures are evaluated with alternative techniques along with traditional methods (9-12th Grades Biology Curriculum). The fact that drawing-writing technique can be used for different age-group levels is one of its advantages (Backett-Milburn and McKie, 1999). Therefore, an education system which aims at raising individuals that express themselves freely and think critically and reflectively must benefit more from alternative techniques such as drawing-writing technique that help analyze students' thoughts in depth.

The results of the study related to the students' explanations and drawings about disease can be taken into consideration for 9th grade Health Education Course by teachers and curriculum developers. Then, it could be help to design to well-organized methodology or teaching designs for Biology Course and Health Education Course.

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