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**SCIENTIFIC VIEWS AND RELIGIOUS BELIEFS OF TURKISH
THEOLOGICAL FACULTY'S STUDENTS: THE CASE OF GENETIC
ENGINEERING STUDIES AND BIYOETHIC**

Abstract:

The aim of this study is diagnosing Turkish Theological Faculty students' ideas about genetic engineering studies and biyoethic with their existing religious beliefs. The data gathered from 20 students (10 male and 10 female) who are attending second class of Theological Faculty in Turkey. The data was collected in 2014. In this study qualitative research method is used. A survey instrument that includes 20 open-ended questions was applied and semi-structured interviews are made. The open-ended questions include that responses about (a) their understanding of the genetic engineering studies and biyoethic, (b) their perception of conflict between these studies- biyoethic and religion. The data was treated by qualitative data analysis - open coding. As a consequence of this research, it has been revealed that theological faculty students have mostly negative attitudes towards genetic studies.

Keywords:

Biyoethic, genetic engineering, science teaching, religion

JEL Classification: I29

Introduction

'Genetic engineering made possible of gene transfer without discriminating microorganism, plant, animal or human. However, although these scientific techniques have benefits, they cause arguments because of their ethical and social impacts' (as cited in Bal, Keskin Samancı, Bozkurt, 2007).

Such an important subject in terms of society should be highly understood to take the best advantage. Therefore, there are several studies that measures the general knowledge of the students on the topic of genetics and biotechnology that provides many benefits for humanity (Lock and Miles, 1993; Chen and Raffan, 1999).

There is a strong relationship between knowledge on genetic engineering and student attitudes. Wrong or imperfect knowledge in biotechnology causes students to have a poor attitude against this field (Lamanauskas, Makarskaitė and Petkevičienė, 2008; Jallinoja and Aro, 2000; Prokop et al., 2007).

Turkey is a secular democratic state with a Muslim majority. Özay Köse (2010) has investigated biology students' and teachers' religious beliefs and attitudes towards theory of evolution in Turkey and she found that the majority of the participants rejected the theory of evolution and their rejection of evolution correlated strongly with their religious beliefs and for students, with their teachers' attitudes towards evolution and its teaching in schools. There are various studies investigated the correlation between the students' and teachers' scientific views about evolution and religious (Dagher and BouJaoude, 1997; Özay Köse, 2010; BouJaoude et. al., 2011; Hokayem and BouJaoude, 2008). Results indicated that religion seems to play an important role in people's positions regarding evolution.

With these purposes the aim of this study is diagnosing Turkish Theological Faculty students' ideas about genetic engineering studies and bioethic with their existing religious beliefs.

Method

Design of the research

A qualitative approach was adopted.

Sampling

The research was performed in Turkey. The data were gathered from 20 students (10 female, 10 male) who were randomly selected from a theological faculty in Istanbul in Turkey. All the participated students attending last class of the faculty.

Semi-structured interviews were carried out with all students who participated in this research.

Data collection

The data were collected in two steps. First, a survey instrument that includes 20 open-ended questions was applied to the students. The open-ended questions include that responses about (10 questions) their understanding of the genetic engineering studies and bioethic, (10) their perception of conflict between these studies- bioethic and religion. In the second step, semi-structured interviews were carried out in order to examine the thoughts of the students more thoroughly. During the interviews, other questions in parallel with the subject of the genetic engineering and bioethic were asked in order to reveal their thinking in more detail. With all the remaining questions, the participants were allowed time to express their ideas freely without being interrupted. If they were reluctant to talk, or at a loss for words, the researcher used further questions to elicit more information. The answers received were recorded by the researcher by taking written notes. Each student's interview lasted for approximately 20 min. The data were collected in 2014.

Data analysis

In this qualitative research students' scientific views towards genetic engineering and bioethic issues was explored by phenomenological approach. Phenomenological approaches help the researchers to understand the phenomena in detail by means of rich descriptions of data (Holstein, Gubrium, 1996).

The data was treated by qualitative data analysis - open coding (Bryman and Burgess, 1993). The data obtained from interviews were categorized and arranged based on the alternative ideas of students.

Results

The results are separately examined for each question.

For the questions 'What do you understand about genetic engineering? What is genetic engineering?', all of the participants answered that genetic engineering is about gene transfers. All of them knew what genetic engineering is but the knowledge is changing.

For the question 'Can you give an example about genetic engineering studies?', most of the students gave human cloning as an example. Genetic studies on corns and tomatoes are also stated.

For the questions 'What do you think about genetic engineering studies? Are they necessary or not? Why?', most of the participants thought that genetic engineering studies are not necessary because this would disturb the ecological balance. 17 of them also said that genetic studies are not ethic.

For the questions 'Can modification of genes of organisms disturb the ecological balance? How?', all of the participants said that gene modification could disturb the ecological balance. Because they thought that 'God created the World in perfect order'.

One of the student stated that *'If the human disturb the ecological balance by modification of genes, the god will punish us'*.

For the question 'Which organism genetic studies should be performed on further?', most of the participants think that genetic studies must be stopped. They state that genetic studies should be performed mostly on microorganisms when the results of animals, plants and microorganisms are compared with each other.

For the question 'What do you understand about biyoethic?', 18 of the participants know the term of biyoethic. One of the example for it is that: *'Ethical issues on biological problems'*. The others could not give any answer about biyoethic.

For the question 'Can you give an example about biyoethic?', they mostly gave examples about Dolly (first clonning sheep). Down Sendrome baby or genetic diagnosis before birth are also stated.

For the question 'What do you think about genetically modified organism?', none of the participant thouht that genetically modified organisms are necessary for world development. Most of the participants stated that the use of the genetically modified plants is not healthy. Two of them thought that planting modified seeds would cause a biological war. They stated that *'the modified planting seeds are not fertile'*.

For the question 'What do you think about modifying tomatoes gene?', 19 of those who participated in the survey thought that the modification of tomato genes is unhealthy. Only one participant stated that *'it is good to find tomatoes in all seasons'*.

For the question 'What do you think about modifying an animal gene?', all of the participants thought that genetically modified animals will disturb the ecological balance. Five of them stated that *'The God said that do not change the creation of living things.'*

For the question 'What do you think about human cloning?', none of the participants thought that the human cloning is a positive development. All of the participants said that this will disturb the balance of the World and they thoght that this will damage family life.

For the questions 'In the last months of pregnancy, a woman who learns that her baby would have serious health problems. Should that woman take the risk? Why?', all of the participants thouhgt that the woman must take the risks. They said that a baby must born inspite of illness. Most of them said that *'nobody can take the living rights of a baby.'*

For the questions 'In the last months of pregnancy, a woman who learns that birth of her baby put her life in a serious danger. Should that woman take the risk? Why?', all the participants thought that the woman should not take any risk and end the pregnancy. One of them stated that *'life is sacred and nobody is allowed to end her life'*.

For the question 'What do you think about (rental) surrogate mother?', all of the participants thought that this is not ethic for Islam.

For the question 'What do you think about sperm bank?', all of the participants thought that this is not appropriate.

For the question 'What do you think about uterus plantation?', all of the participants thought that this is not ethic. For above last three questions all of the participants said that rental mother, sperm bank and uterus plantation are not suitable for our culture and belief because of creation.

For the question 'What do you think about selection of special baby? (e.g. baby sex)', only 2 participants thought that the prenatal determination of baby characteristics will have a protective effect on the diseases that may occur in the future. Most of the participants stated that this will disturb the balance of the World.

For the question 'What do you think about ordering a baby (brother or sister) for bone marrow transplant for leukemia child?', all of them found this ethic.

For the question 'What do you think about the relation between genetic engineering and religious?', most of the participants thought that sometimes Islam and scientific studies can conflict and in this situation Islamic rules are right.

For the question 'What do you think about the relation between biyoethic and religious?' most of the students thought that biyoethic is about ethical issues and ethical issues do not conflict with Islam.

Discussion

As a consequence of this research, it has been revealed that theological faculty students have mostly negative attitudes towards genetic studies. But when we explained the genetic engineering studies deeply, 14 students who participated in this study said that genetic studies are necessary if used for the right purposes.

Differently, Sürmeli and Şahin (2010) found that students who have attended Primary Science Education and Biology departments and Medical Faculty have mostly positive attitudes towards genetic studies. Sürmeli and Şahin (2012) investigated the content knowledge of 112 pre-service science teachers (PST) on cloning. They found that most of the preservice science teachers get their knowledge on cloning technology from informal resources, their knowledge were found limited and they found cloning as risky.

There is a strong agreement among educators that training the ethical and social consequences of genetic engineering is necessary for the development of students into well-rounded citizens needed in the future (Booth and Garrett, 2004). When students learn biotechnology, information should be given not only at school level but also with its social dimension (Moses, 2003).

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