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Social Immunology Awareness Survey

Toplumsal İmmünoloji Bilinci Anketi

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ABSTRACT

Objectives: This study aims to investigate social awareness and perspective regarding immunology.

Materials and methods: This study is a survey conducted with 179 participants living in Antalya who have no known immune system diseases. Healthcare workers and students studying in any health related department were excluded from the study. Participants were asked 14 questions about their level of knowledge regarding immune system disorders, organs and tissues, and their perspective of vaccine therapy.

Results: Of the participants, 75% had never heard of the term "immunology", 22.2% thought that immune system diseases have no treatment, and 77% knew that the commonly used vaccine therapy is intended to stimulate the immune system.

Conclusion: Although immunology and vaccine therapies are fields of medicine with increasing importance, society's level of knowledge regarding these subjects is quite low. Social awareness for these subjects must be increased with trainings to be given at schools by Ministry of Health and foundations.

Keywords: Immunology; social awareness; vaccine therapy.

ÖZET

Amaç: Bu çalışmada immünoloji hakkında toplumsal bilinç ve bakış açısı araştırıldı.

Gereç ve yöntemler: Bu çalışma Antalya'da yaşayan ve bilinen bir immün sistem hastalığı olmayan 179 katılımcı ile yapılmış bir anket çalışmasıdır. Sağlık sektöründe çalışanlar ve üniversitede sağlıkla ilgili herhangi bir bölümde öğrenim gören öğrenciler çalışmaya alınmadı. Katılımcılara immün sistem bozuklukları, organları ve dokularına ilişkin bilgi düzeyleri ve aşı tedavilerine bakış açıları hakkında 14 soru soruldu.

Bulgular: Katılımcıların %75'i "immünoloji" terimini daha önce hiç duymamıştı, %22.2'si immün sistem hastalıklarının tedavisinin olmadığını düşünüyordu, %77'si ise yaygın olarak kullanılan aşı tedavisinin immün sistemi uyarmak amacıyla yapıldığını biliyordu.

Sonuç: İmmünoloji ve aşı tedavileri tıbbın önemi gittikçe artan alanları olmasına rağmen, toplumun bu konularda bilgi düzeyi oldukça düşüktür. Bu konulardaki sosyal farkındalık Sağlık Bakanlığı ve vakıflar tarafından okullarda verilecek eğitimlerle artırılmalıdır.

Anahtar sözcükler: İmmünoloji; toplumsal bilinç; aşı tedavisi.

Immune system cells are associated with several diseases in all branches of medicine, especially hematology, and immunological mechanisms are effective in fighting many diseases, including acquired immunodeficiency syndrome (AIDS), rheumatological diseases, asthma, cancer, multiple sclerosis (MS). In recent years, it has been shown that immunology plays a role in the etiogenesis of many diseases, causing it to attract attention at the community level.

The immune system can be divided into the innate immune system and acquired immune system. The innate immune system is non-specific and responds quickly, but it is only temporary. The immune system protects organisms from infection via layered barriers, but if a pathogen breaches one of the barriers, the innate

immune system provides an immediate response. The acquired immune system is considered to be specific because it is characterized by an antigen-specific response. It has a stronger immune response than the innate immune system and contains an immunological memory in which each pathogen is "remembered" by a signature antigen.[1] When the same pathogen infects the body for a second time, a stronger and quicker response occurs due to the memory cells.[2] The acquired immune system also is composed of cell-mediated (cellular) and humoral components. The cell-mediated components consist of T cells, macrophages, and natural killer cells. The T lymphocytes become activated as a result of the presentation of antigen by the macrophages and B lymphocytes. Consequently, the T cells transform into either helper T cells (Th) or cytotoxic T cells (Tc). The Tc cells directly kill cells that are infected with pathogens as well as those that are dysfunctional.[3] When an activated Tc cell makes contact with these kinds of cells, it releases cytotoxins (e.g., perforin) which form pores in the target cell's plasma membrane. In addition, granulysin (a protease), which induces the target cell to undergo apoptosis, is also released.[3] The humoral immune response is carried out by the B lymphocytes, and immunoglobulins made by these lymphocytes play a primary role in this response. In addition, the Th cells lead to the proliferation of B lymphocytes.[4]

Today, the science of immunology has spread into a variety of areas, including infectious immunology, allergic immunity, tumor immunology, and vaccine immunology. Herein, we report the results of a study in which we endeavored to determine the level of knowledge that adults have regarding this vital branch of medical science.

MATERIALS AND METHODS

This study surveyed 179 individuals over the age of 18 who lived in Antalya and had no diseases associated with the immune system. Healthcare workers and students studying in the healthcare sector were excluded. We asked the participants 14 questions (Table 1) regarding their knowledge about immune system disorders and immune system organs and tissues in the human body and obtained information concerning their understanding of vaccine therapy. Our goal was to determine how much they knew about immune system disorders and get their opinions with respect to the curability of immune system diseases. In addition, we wanted to find out if they knew any vocabulary related to the immune system and, if so, whether they could provide definitions for these words. The questions about vaccinations focused on the purpose of vaccine therapy, cancer treatment with vaccine therapy, and smallpox. Furthermore, we wanted to ascertain whether the study participants had any knowledge of the immune system organs and tissues and if they knew why people get immune system diseases. The last question focused on AIDS and human immunodeficiency virus (HIV) and asked whether they knew how HIV causes AIDS. Microsoft excel 2010 graphic analysis was used to make all of the figures that accompanied the questions.

RESULTS

We found that 87% of the individuals who took part in this study had no relatives with an immune system disease (Figure 1a) and that of the 13% who had a relative with this type of disease, 81.6% did not know the name of the disease (Figure 1b). We also determined that 22.2% of the participants believed that immune system diseases could not be cured and that 75% had never previously heard of the word "immunology" (Figure 1c). Moreover, of the 25% who had heard of the word, 89% did not know what it meant. Furthermore, 45% had heard of the word "antibody" (Figure 1d), but 19% of these individuals did not know what it meant.

Our questionnaire also found that 77% of the study participants knew that vaccine therapy is commonly used to stimulate the immune system (Figure 1e), but 32% did not know that vaccinations had been used to eradicate smallpox. Hence, since scientists have developed a vaccine against human papillomavirus (HPV), a sexually transmitted virus which causes cervical cancer in women,[5] there is hope that cervical cancer can also be similarly eradicated in the future.[6] In this study, 67% of the individuals did not know about the HPV vaccine or about any recent developments related to it. In addition, scientists are trying to develop successful vaccine therapies to fight other cancer cells, but 25% of our participants had no knowledge of this.

When we asked the individuals if they knew any of the immune system tissues or organs, 13% replied blood, 5% answered the spleen, 9% responded with bone marrow, 8% replied liver, 13% said the lymph nodes, 39% thought all of the above, and the remaining 13% gave other organs (brain, bowel, stomach, heart) as their answer (Figure 2). When we asked about how immune system diseases might occur, 27% thought they were familial or hereditary, 39% believed that they stemmed from the environment, food, or individual lifestyles, and 35% of the individuals replied that viruses were the culprit (Figure 3). Finally, 80% of the study participants knew that AIDS stems from the progressive failure of the immune system when HIV damages the immune system cells and that HIV is frequently transmitted via unprotected sexual intercourse.

The survey questions

Question 1:	Is there any immunocompromised patient in your family or your environment?	a) Yes b) No
Question 2:	If there is an immunocompromised patient in your family or your circle, do you know the exact name of the disease that they have?	a) Yes b) No
Question 3:	Do you think immune system disorders are incurable?	a) Yes b) No
Question 4:	Have you ever heard of the term "immunology"?	a) Yes b) No
Question 5:	Did you know that immunology is a branch of science dealing with the immune system?	a) Yes b) No
Question 6:	Have you ever heard of the term "antibody"?	a) Yes b) No
Question 7:	Do you know that antibodies are defense particles that are produced by the immune system when foreign bacteria enter the body?	a) Yes b) No
Question 8:	Do you know that vaccine therapy is commonly used to stimulate the immune system?	a) Yes b) No
Question 9:	Do you know that smallpox was eradicated by the use of vaccinations?	a) Yes b) No
Question 10:	Do you know that scientists have developed a vaccine against human papilloma virus (HPV), a sexually transmitted virus that causes cervical cancer in women, and that this vaccine could possibly be used to eradicate cervical cancer in the future?	a) Yes b) No
Question 11:	Do you know that scientists are working to develop a cancer vaccine therapy to fight against cancer cells?	a) Yes b) No
Question 12:	Do you know which organs or tissues make up the immune system?	a) Blood b) Spleen c) Bone marrow d) Liver e) Lymph nodes f) All (blood, spleen, bone marrow, liver, lymph nodes) g) Others (brain, bowel, stomach, heart)
Question 13:	How do you think diseases of the immune system occur?	a) Familial or hereditary b) Environment, food, or individual lifestyle c) Viruses
Question 14:	Do you know that AIDS is the result of the progressive failure of the immune system when human immunodeficiency virus (HIV) damages immune system cells and that HIV is frequently transmitted via unprotected sexual intercourse?	a) Yes b) No

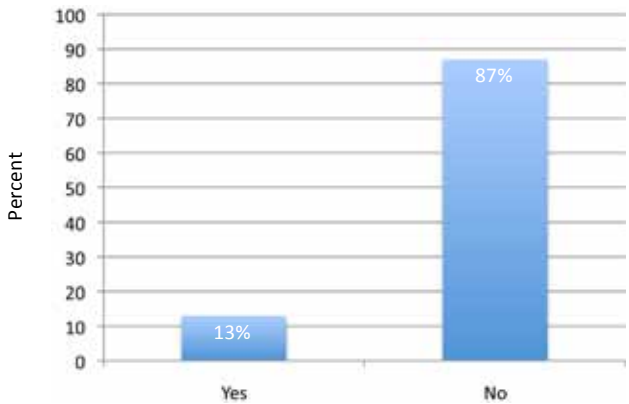

Figure 1a. Is there any immunocompromised patient in your family or around your environment?

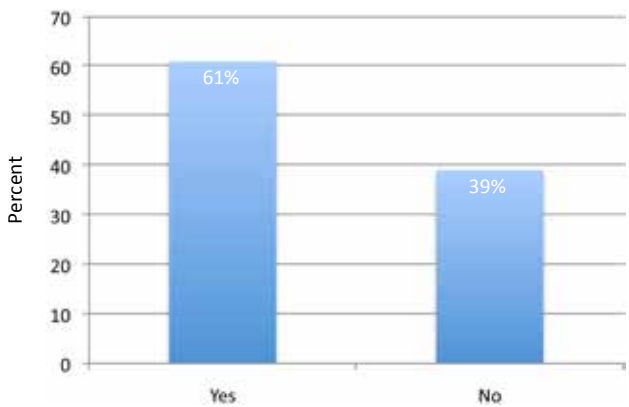

Figure 1b. If there is a immunocompromised patient in your family or your circle, do you know the exact name of the disease?

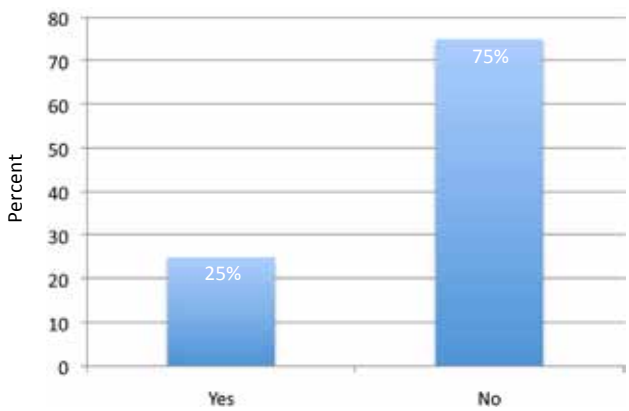

Figure 1c. Have you ever heard the word "immunology"?

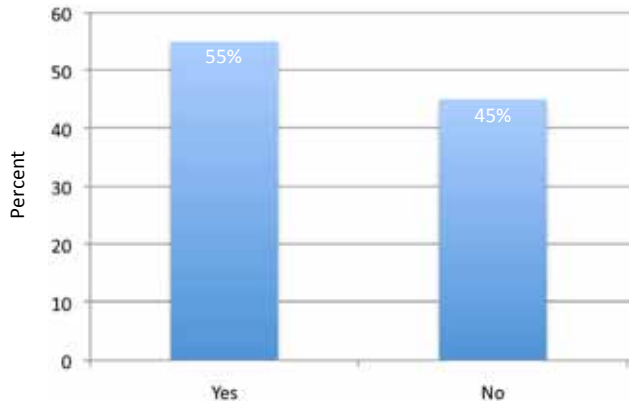

Figure 1d. Have you ever heard the word "antibody"?

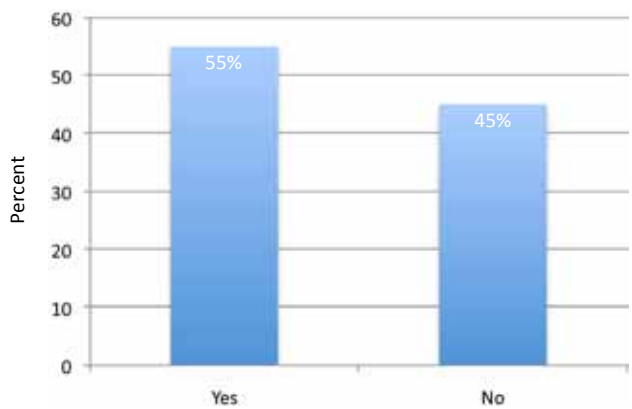

Figure 1e. Do you know that commonly usage of vaccine therapy is in order to stimulate the immune system?

DISCUSSION

In Turkey, the immunization program (or national vaccination program) comprises the following: the hepatitis A vaccine, the Bacillus Calmette-Guérin (BCG) vaccine for tuberculosis, a combination vaccine that includes vaccines to fight diphtheria, acellular pertussis, and tetanus along with an inactive polio vaccine, the haemophilus influenzae type B (Hib) vaccine, the pneumococcal conjugate vaccine, the measles, mumps, and rubella vaccine, an oral polio vaccine, an adult form of the tetanus-diphtheria vaccine, a hepatitis vaccine, and a chickenpox vaccine.[7] The Turkish Vaccination Board aims to contribute to the prevention of diseases; therefore, they have recommended a widespread immunization program of the highest standard for all segments of society.[8] With that in mind, we believe that the HPV vaccine should also be added to our country's vaccination program since it is has the potential to eradicate cervical cancer in women. In addition, children should be educated in schools about sexually transmitted diseases, and this should not be limited to those diseases transmitted by body fluids but also include information about those that can be transmitted via skin contact.

Social awareness is crucial for disease prevention, and there has been a study conducted in Turkey that focused on this topic as it relates to cancer and hematology.[9] While

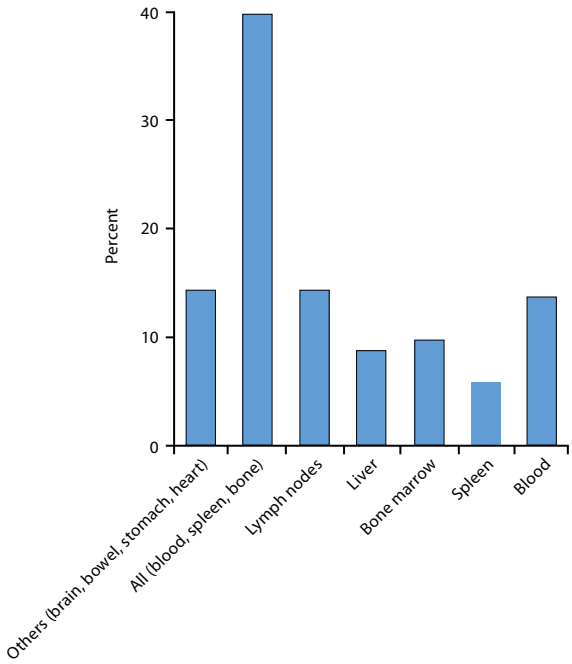

Figure 2. Do you think which organs/body parts are immune system elements?

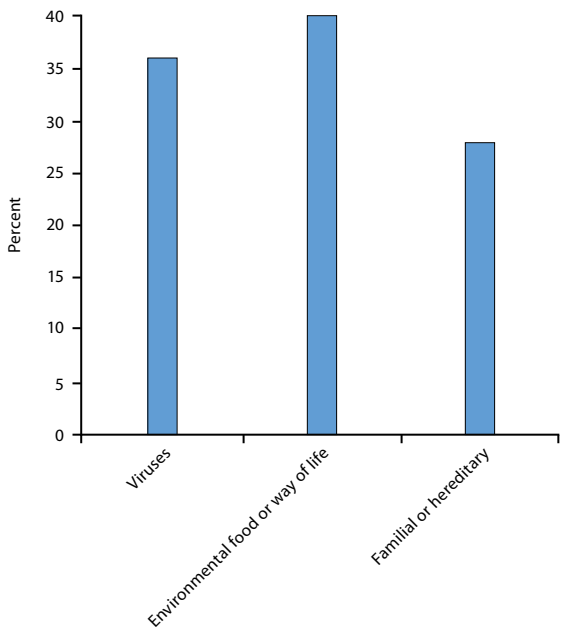

Figure 3. How do you think failure and disease of the immune system occurs?

immunology and vaccine therapy are fields of medicine which have become increasingly more important, our findings revealed that the social knowledge associated with these subjects is quite low. Furthermore, the majority of people do not possess enough knowledge about the features of the immune system or the effects of vaccinations. Therefore, the Ministry of Health along with the schools and various foundations must work hard to increase this social awareness. Moreover, we believe that all children should be given vaccinations in the teenage years to prevent HPV.

Declaration of conflicting interests

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