

The Awareness of Health Sciences Students on Communicable Diseases Risks

Dilek BAYKAL^{1,a}, Ezgi Nur AKAR^{1,b}

¹Department of Nursing, Faculty of Health Sciences, Istanbul Atlas University, Istanbul, TURKEY

ORCID: ^a0000-0001-5965-9318; ^b0000-0001-9636-9379

ABSTRACT

Objective: Communicable diseases are serious social problems that cause morbidity and mortality. Students studying health sciences face the risk of communicable diseases from the very beginning of their academic education. For this reason, the study aimed to examine the awareness levels of health science students on the risks of communicable diseases and the factors affecting this awareness. **Materials and Method:** This is a descriptive study. The study was conducted with students studying at private universities in Istanbul between April 2022 and April 2023. Two hundred fifty students studying in the field of health sciences were included. Data was collected using the socio-demographic characteristics questionnaire to determine the socio-demographic characteristics of the participants and the Communicable Diseases Risk Awareness and Protection Scale to determine the risk awareness levels with regards to the communicable diseases, and finally, the prevention scale was used as well. **Results:** The study revealed that the students studying health sciences were, in general, aware of the risks of communicable diseases and had a high level of protection. Furthermore, it was concluded that the female students' awareness of common life risk ($p<0.05$) and personal contact awareness were higher compared to their males counterparts ($p<0.05$). **Conclusion:** Consequently, different educational strategies may be developed to further increase male students' awareness levels of the risks of communicable diseases.

Key words: Health, Awareness, Students, Risk, Communicable Diseases.

Sağlık Bilimleri Alanında Öğrenim Gören Öğrencilerin Bulaşıcı Hastalık Riskleri Konusundaki Farkındalığı

ÖZ

Amaç: Bulaşıcı hastalıklar, morbidite ve mortaliteye neden olan ciddi sosyal sorunlardır. Sağlık bilimleri okuyan öğrenciler, akademik eğitimlerinin başından itibaren bulaşıcı hastalık riskiyle karşı karşıyadır. Bu nedenle çalışmada sağlık bilimleri alanında öğrenim gören öğrencilerin bulaşıcı hastalık riskleri konusundaki farkındalıklarının ve bu farkındalıkla ilişkili faktörlerin incelenmesi amaçlandı. **Gereç ve Yöntem:** Tanımlayıcı bir çalışmadır. Çalışma Nisan 2022-Nisan 2023 tarihleri arasında İstanbul'da vakıf üniversitelerinde okuyan öğrencilerle gerçekleştirildi. Sağlık bilimlerinde okuyan ikiyüz elli öğrenci çalışmaya dahil edildi. Veriler, katılımcıların sosyo-demografik özelliklerini belirlemeye yönelik Sosyo-Demografik Özellikler Anketi, Bulaşıcı Hastalıklar Risk Farkındalığı ve Korunma Ölçeği kullanılarak toplanmıştır. **Bulgular:** Araştırmanın sonuçları, sağlık bilimleri okuyan öğrencilerin genel olarak bulaşıcı hastalıkların risklerinin farkında olduklarını ve korunma düzeylerinin yüksek olduğunu ortaya koydu. Ayrıca kız öğrencilerin ortak yaşam riski ($p<0,05$) ve kişisel temas farkındalıklarının erkeklere göre daha yüksek olduğu sonucuna varıldı. ($p<0,05$). **Sonuç:** Erkek öğrencilerin bulaşıcı hastalık riskine ilişkin farkındalığını daha da artırmak için farklı eğitim stratejilerini geliştirebilir.

Anahtar kelimeler: Sağlık, Farkındalık, Öğrenci, Risk, Bulaşıcı Hastalık.

INTRODUCTION

Communicable diseases are a phenomenon which have survived from history to the present, which cause high rates of morbidity and mortality and threaten personal and public health. Tuberculosis, a disease which saw a drastic increase in cases in the 1980s, the measles virus that spread intercontinentally between 2010 and 2012, diphtheria, whooping cough, salmonella virus and endemic diarrhea which were manifested in western countries between 2011-2013, cholera epidemics seen in many continents of the world, the COVID-19 pandemic which broke out in 2020 and is still with us with different variations and finally the monkeypox virus, which started to spread in 2022. These are some of the viruses which stand out among the ones which affect the whole world (Tulchinsky and Varavikova, 2014; WHO, 2023) Although there are immunization services available for many of the existing communicable diseases, both recurrent and newly emerging infections are encountered in the world every day. For this reason, studies which aim to raise awareness on communicable diseases are gaining importance day by day (Nii-Trebi, 2017).

Communicable diseases occur due to various microorganisms (Nii-Trebi, 2017). These diseases affect people of all age groups, particularly children and adults (Esposito, 2016). Communicable diseases, in particular those transmitted through the respiratory tract, are spread to several continents and cause a worldwide pandemic. Students studying in health-related departments frequently encounter communicable diseases which cause pandemics during their clinical practices throughout their academic education. The standard treatment protocols for communicable diseases are often not yet known and these diseases require isolation as the first symptoms appear, in order to prevent further infection of other individuals. Therefore, health care professionals and candidates are at higher risk as they form the frontlines with regards to the battle waged against these communicable diseases. (Shbaklo et al. 2021) Furthermore, health care professionals are not only concerned about the health of their patients, but also about their own health and the health of their families (Adams and Walls, 2020). Throughout pandemics, the crowd of patients increases in accordance with the heightened rate of the transmission

of disease and health care professionals have to fulfill unexpected tasks in the field of care (Filip et al., 2022). In order to cope with all of these situations, it is necessary to investigate the knowledge acquired by prospective health care professionals regarding the risks of communicable diseases throughout their academic education. Students studying in health-related departments participate in clinical practices besides theoretical courses. For this reason, it is significant to evaluate the awareness levels of the students studying in health departments on the risks of communicable diseases.

The literature indicates that the risk awareness levels of students, especially regarding sexually transmitted diseases (STDs), has been evaluated. It has been found that students do not have sufficient knowledge about sexually transmitted diseases and methods of protection (Solmaz Avcıkurt, 2014; Akalpler and Eroğlu, 2015) and that medical faculty and health vocational school students do not have a very high level of knowledge about STDs (Kurt and Yılmaz, 2012; Akça et al., 2016). Additionally, it is noted that the knowledge levels of those living in the eastern regions of Türkiye is lower compared to others (Açikel and Babayiğit, 2005). On the other hand, there are also studies in the literature that measure the knowledge and awareness levels regarding a single communicable disease. For example, Babaoglu and Demir measured the knowledge and awareness levels of individuals living in semi-urban areas regarding the Brucella disease and concluded that the awareness levels towards this disease was low (Babaoğlu and Demir, 2017). In a study evaluating the knowledge levels of nurses about zoonotic diseases, it was found that only 5% of the nurses had sufficient knowledge (Taştan et al., 2016). Furthermore, a review evaluating the awareness of midwives and women regarding the cytomegalovirus infection during pregnancy found that their knowledge levels about maternal cytomegalovirus infection was quite limited (Kerr and Hughes, 2023). Additionally, a study comparing the awareness of healthcare professionals and the general population regarding cholera found that the level of knowledge about the disease and reluctance to receive education decreased awareness about the disease, and that the parameter of being a female instead of a male was a factor that increased awareness. It was also found that healthcare professionals were less afraid of the

disease compared to the general population, and this finding was attributed to their higher level of knowledge (Akel et al., 2023). In a study conducted with emergency service professionals in Iran which assessed knowledge, awareness levels, and practices regarding of COVID-19 and Severe Acute Respiratory Syndrome Coronavirus 2 infection, it was found that 55.63% of the participants correctly answered the survey questions, but this was not related to their education, age, or experience (Ebrahimi et al., 2023). As understood from the studies conducted, it appears that while risk and awareness related to a single communicable disease have been investigated, research on the risk and awareness about communicable diseases in a holistic manner has been lacking. However, the health care students have a high risk of encountering all communicable diseases. Therefore, it is important to assess the risk and awareness levels related to communicable diseases in general.

This study aims to determine the awareness levels of students studying in the field of health sciences on the risks of communicable diseases and the factors affecting this awareness.

Thus, this study seeks answers to the following research questions.

- What is the awareness level of students studying in the field of health sciences regarding the risks of communicable diseases?
- What are the factors affecting the awareness levels of students studying in health sciences with regards to the risks of communicable diseases?

MATERIALS AND METHOD

Research Type

This is a descriptive study.

Design

The population of the study consists of students living in Istanbul, studying at the health sciences faculties of universities, and having consented to participate in the study after the purpose of the study is explained.

Sample Size and Recruitment

Inclusion Criteria

- Studying at the Faculty of Health Sciences
- Being over 18 years of age
- Studying within the borders of Istanbul

Exclusion Criteria

- Being below 18 years of age
- Studying at disciplines other than the Faculty of Health Sciences

The authors aimed to reach the entire population without performing any sample selection. Certain confidence intervals and significance levels were predetermined in order to represent the population of the sample and based on the literature review the calculated figure of 384 is concluded to be a sufficient sample no matter how large the population size is (Barlett et al., 2001; Altunışık et al., 2010), so the authors planned to reach 384 individuals. 250 students were reached for the purpose of the study. Therefore, 65.1% of the targeted population has been reached. All 250 students filled out the form completely. The forms of 38 students which incomplete were excluded from the study.

Data Collection and Implementation Process

Data was collected using the socio-demographic characteristics questionnaire to determine the socio-demographic characteristics of the participants and Communicable Diseases Risk Awareness and Protection Scale aiming to determine the risk awareness on communicable diseases, and finally, via the prevention scale. The socio-demographic characteristics questionnaire is a questionnaire which helps to determine the age, sex, class, alcohol and cigarette usage habits of the participants.

Communicable Diseases Risk Awareness and Protection scale is developed by Ener et al. (2022), aims to measure and evaluate the general risk awareness and protection levels of individuals in the society over the age of 18. The five-point Likert type scale consists of 30 items. The items related with awareness were scored as "strongly disagree (1 point)",

"disagree (2 points)", "neither agree/nor disagree (3 points)", "agree (4 points)", "strongly agree (5 points)". Behavior-related items were scored as "never (1 point)", "rarely (2 points)", "sometimes (3 points)", "usually (4 points)", "always (5 points)". There were no reverse coded items. The increase in the total score obtained from the scale is explained by the increase in risk awareness and protection levels of individuals. The scale, of which validity and reliability were confirmed, consists of six sub-dimensions and 36 items. Total Cronbach α values of the scale and dimensions are 0.91 and between 0.60-0.78 respectively. The sub-dimensions were defined as 'Common Life Risk Awareness', 'Personal Protection Awareness', 'Protection Behaviors', 'Hand Washing Behaviors', 'Social Protection Awareness' and 'Personal Contact Awareness'. Scores to be obtained from the scale range between 36 to 180 and there is no cut-off point. The increase in the total score obtained from the scale is explained by the increase in the general risk awareness and protection levels of individuals in terms of communicable diseases (Ener et al., 2022).

Ethical Considerations

Consent was obtained from the ethics committee of the university before the inception of the study. (03.30.2022/13571) The purpose of the study was explained to the participants who met the inclusion criteria, thereafter their verbal and written consents were obtained. Throughout the study, The Declaration of Helsinki was adhered to.

Statistical Analysis

Data was entered into and analyzed using the SPSS program version 22.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to report the sociodemographic characteristics and Communicable Diseases Risk Awareness and Protection Scale.

The Kolmogorov-Smirnov test was used for normality distribution in order to determine the type of tests used in comparisons. Comparison of the items in the Communicable Diseases Risk Awareness and Protection Scale and Socio-demographic Characteristics Questionnaire were carried out using the non-parametric tests (t-test, Mann-Whitney U test, and Kruskal-Wallis).

RESULTS

Mean age of the students was 20.75 ± 2.76 years, 81.2% of them were female, 49.6% were studying nursing, 49.6% were first year students. 72.4% of them did not use alcohol and 74.8% did not smoke. In addition, 67.2% of the participants stated that they did not experience any communicable disease infection (Table 1).

Table 1. Socio-Demographic Characteristics of Students

Characteristics		n	%
Age (Min-Max) (X \pm SD)		(18-40) (20.75 \pm 2.76)	
Gender	Female	203	81.2
	Male	47	18.8
Department of ...	Nursing	124	49.6
	Physical therapy and rehabilitation	38	15.2
	Nutrition and dietetics	30	12.0
	Speech and language therapy	39	15.6
	Midwifery	19	7.6
Grade	1st	124	49.6
	2nd	89	35.6
	3rd	12	4.8
	4th	25	10
Alcohol	Yes	69	27.6
	No	181	72.4
Tobacco	Yes	63	25.2
	No	187	74.8
Contagious disease	Yes	82	32.8
	No	168	67.2

Mean common life risk awareness score in the Communicable Diseases Risk Awareness and Prevention Scale was $30.49 \pm$

6.15, mean personal protection awareness sub-dimension score was 32.45 ± 4.68 , mean protection behavior sub-dimension score was 31.19 ± 5.81 , mean hand washing behavior sub-dimension score was 13.21 ± 2.15 , mean social protection awareness sub-dimension score was 15.68 ± 2.62 whereas mean personal contact awareness sub-dimension score was 17.55 ± 2.44 . Mean total score, obtained in the scale, was found to be 140.6 ± 18.66 (Table 2).

Table 2. The Mean of Communicable Diseases Risk Awareness and Protection Scale

Subgroups	Min	Max	X \pm SD
Common Life Risk Awareness	14.00	45.00	30.49 \pm 6.15
Personal Protection Awareness	14.00	40.00	32.45 \pm 4.68
Protection Behaviors	8.00	40.00	31.19 \pm 5.81

Hand Washing Behaviors	3.00	15.00	13.21 \pm 2.15
Social Protection Awareness	4.00	20.00	15.68 \pm 2.62
Personal Contact Awareness	6.00	20.00	17.55 \pm 2.44
Total	65.00	180.00	140.6 \pm 18.66

Comparison of the demographic characteristics of the students with their scores in the scale revealed a significant correlation between female students and the subgroups of common life risk awareness ($p=0.001$) and personal contact awareness ($p=0.01$). In addition, a significant relationship was found between the female sex and total scores obtained in the scale ($p=0.00$). No significant correlation was determined between other demographic characteristics and scores obtained in the subgroups and total scores obtained in the scale (Table 3).

Table 3. Comparison of the Demographic Characteristics of the Students With Their Scores on the Scale

Variables	Communicable diseases risk awareness and protection scale													
	Common Life Risk Awareness		Personal Protection Awareness		Protection Behaviors		Hand Washing Behaviors		Social Protection Awareness		Personal Contact Awareness		Total	
	MR	p	MR	p	MR	p	MR	p	MR	p	MR	p	MR	p
Gender														
Female	132.8	0.001*	128.4	0.18*	128.2	0.20*	129.2	0.08*	125.1	0.86*	130.9	0.01*	131.2	0.00*
Male	93.97		112.8		113.4		109.4		127.1		101.8		100.5	
Department of														
Nursing	129.48	0.65**	128.25	0.31**	128.84	0.84**	131.25	0.14**	135.42	0.10**	130.62	0.19**	130.82	0.34**
PTR	122.05		116.36		114.84		123.22		107.55		119.30		113.79	
Nutrition	135.35		146.72		128.82		136.67		130.42		142.37		140.15	
SLT	114.58		113.35		120.67		100.03		106.77		115.46		111.55	
Midwifery	113.32		117.32		129.71		127.18		127.32		98.45		119.68	
Grade														
1st	130.1	0.25**	131.5	0.37**	127.3	0.34**	123.3	0.75**	127.7	0.59**	126.6	0.82**	130	0.29**
2nd	115.9		115.6		121.0		123.7		128.3		122.6		117.8	
3rd	111.6		117.4		101.3		135.2		117.6		115.0		103.6	
4th	143.4		134.4		143.5		137.8		108.1		135.1		140.9	
Alcohol use														
Yes	111.8	0.06*	113.5	0.10*	125.8	0.95*	120.0	0.44*	133.7	0.26*	113.3	0.09*	114.9	0.15*
No	130.7		130.0		125.3		127.5		122.3		130.1		129.5	

Tobacco use														
Yes	118.4	0.37*	128.8	0.67*	125.3	0.98*	136.69	0.14*	129.5	0.60*	131.0	0.47*	126.2	0.92*
No	127.8		124.3		125.5		121.73		124.1		123.6		125.2	
Contagious dis.														
Yes	133.54	0.21*	129.96	0.49**	134.40	0.17*	126.81	0.83*	124.53	0.88*	122.93	0.69*	131.51	0.35*
No	121.58		123.32		121.16		124.86		125.97		126.75		122.57	

*MVU, **KW MR: Mean rank PTR: Physical therapy and rehabilitation SLT: Speech and language therapy

DISCUSSION

Results of the study revealed that the students studying in the field of health sciences were, in general, aware of the risks of communicable diseases and had a high level of protection when encountering these diseases. Furthermore, it was concluded that female students' awareness of common life risk and personal contact awareness were higher compared to male students.

Communicable diseases are difficult to detect early, have limited treatment options and can lead to serious complications. Moreover, communicable diseases also cause a loss of workforce and impose a burden on the country's economy as the infected individuals require isolation. Identification of communicable diseases and learning the transmission routes are very important in terms of the prevention of these diseases. Education is the most important factor concerning the prevention of communicable diseases (WHO, 2020; Demir et al., 2020). Students studying in health-related departments participate in clinical practices besides theoretical courses. For this reason, it is necessary to increase the awareness of students regarding communicable diseases in order to ensure that they protect both themselves and the patients they care for (Miller et al., 2023). Academic education on communicable diseases and ways of prevention thereof are provided to students from the first year they start studying at the faculty of health sciences and is corroborated in the following years. High level of risk awareness and protection against communicable diseases of the students studying in different departments and participating in this study is explained by the effect of the academic education they received.

The findings of the study indicating that health sciences students possess a general awareness of the risks associated

with communicable diseases and exhibit a high level of protection are significant in the context of health education and public health. The presence regarding the awareness of communicable diseases among students is crucial, as it directly correlates with their ability to engage in preventive and protective behaviors. Health education programs have been shown to significantly enhance knowledge and behaviors regarding infectious diseases among students, which is essential for curbing the spread of such diseases (Suryasa et al., 2022; Wang et al., 2018). The emphasis on health education in curricula is vital, especially in light of recent global health crises, as it equips students with the necessary knowledge to make informed health decisions (Patja et al., 2022).

Moreover, the study's conclusion that female students demonstrate higher awareness levels of common life risks and personal contact awareness compared to their male counterparts aligns with existing literature that highlights differences of sex in terms of health literacy and risk perception. Research has indicated that female students often exhibit greater health-seeking behaviors and are more likely to engage in preventive health measures (Karimi-Sari et al., 2017). This disparity in awareness which is attributed to sex, may stem from various social and educational factors, including differences in communication styles and socialization processes that encourage women to be more attuned to health-related issues (Shravani, 2018).

The implications of these findings are profound, as they suggest the need for optimally tailored health education strategies which consider gender differences in awareness and behavior. For instance, health education programs could be designed to specifically address the gaps in knowledge among male students, thereby fostering a more equitable understanding of health risks (Afshari et al., 2019).

Additionally, the integration of health literacy into science education, as suggested by recent studies, could enhance the overall effectiveness of health education initiatives (Hussein and Khalil, 2020). Furthermore, the high level of protection observed among health sciences students can be attributed to their specialized training and education, which emphasizes the importance of understanding communicable diseases and the measures necessary to prevent their spread (Aldahmash and Almutairi, 2023). This specialized knowledge not only empowers students to protect themselves but also positions them as potential advocates for health promotion within their communities (Islami, 2023).

In conclusion, the study underscores the critical role of health education in fostering awareness and protective behaviors against communicable diseases among health sciences students. The observed gender differences in awareness highlight the need for targeted educational interventions to address these disparities, ultimately contributing to a more informed and health-conscious population.

Limitations

This study, which explains the infectious disease awareness levels of students studying in the health science department and affecting factors, has some limitations. First of all, since this study is a descriptive one, the achieved results are limited and are not in-depth due to the nature of planning a descriptive study. For this reason, it may be recommended to conduct a qualitative study on the research topic. Another limitation is that the study was conducted in one province and the sample size was limited. This makes the generalizability of the research results problematic. However, it is thought to be important that Istanbul is the largest city in Türkiye in terms of population.

By conducting research with students at the faculty of health sciences, results were obtained regarding the awareness of all health sciences faculty students about infections and diseases. This situation caused the acquirement of limited and department-specific (such as nursing, midwifery, and nutrition) information of the awareness levels of students.

CONCLUSION

For the purpose of this study, which aimed to examine the awareness levels of students studying in the field of health sciences on the risks of communicable diseases and the factors affecting this awareness, distinctive results were reached along with the results supporting the literature. It was found in this study that students studying in health sciences-related departments have a high awareness of the risks associated with communicable diseases and particularly female students' awareness of common life risks and personal contact awareness were found to be higher than male students. Studying in health sciences-related departments makes the evaluation of the risk awareness on communicable diseases in academic education particularly important since it is inevitable for students to encounter these diseases after their graduation and when they start their professional careers in the field of healthcare. Considering the transmission rates of communicable diseases, evaluation of the risk awareness of healthcare professionals gains importance in the prevention of pandemics. Higher risk awareness of female students compared to male students makes one think that sex specific biological and psychological differences should be taken into account while providing education.

AUTHOR CONTRIBUTION

Concept D.B., E.N.A.; Design-D.B.; Supervision- D.B.; Resources- D.B. E.N.A.; Data Collection and/or Processing- D.B., E.N.A.; Analysis and/or Interpretation-D.B.; Literature Search-D.B., E.N.A.; Writing Manuscript- D.B., E.N.A.; Critical Review- D.B., E.N.A.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

FINANCIAL DISCLOSURE

The authors declared that this study has received no financial support.

ETHICAL STATEMENT

Ethics committee approval was received for this study from the ethics committee of Atlas University (Date: March 30, 2022, Number:13571).

REFERENCES

- Açikel, U.D.C.H., Babayiğit, M.A. (2005). Knowledge levels of young adult men about sexually transmitted diseases. *TSK Koruyucu Hekimlik Bülteni*, 4(1), 16-24. <https://www.researchgate.net/publication/26447990>
- Afshari, A., Ghahnaviyeh, L., Khezeli, M., Daniali, S. (2019). Health promotion perception among health-care providers working in educational hospitals of Isfahan, Iran: a qualitative study. *J Educ Health Promot*, 8(1), 144. doi:10.4103/jehp.jehp_336_18
- Akalpler, Ö., Eroğlu, K. (2015). University students' sexual behavior and knowledge levels on common sexually transmitted infections in the Turkish Republic of Northern Cyprus. *J Hacettepe Univ Fac Nurs*, 2(2), 64-74. <https://dergipark.org.tr/tr/download/article-file/88660>
- Akça, B., Altınay, Z.Ö., Demirbaşoğlu, H., Kırdar, İ., Okol, B., Özkan, H.G., et al. (2016). Knowledge and attitudes of the third-year medical students in a university about sexually transmitted diseases and prevention methods. *Fam Pract Palliat Care*, 1(2), 48-52. doi:10.22391/920.256692
- Akel, M., Sakr, F., Haddad, C., Hajj, A., Sacre, H., Zeenny, R.M., et al. (2023). Knowledge, attitude, and practices of the general population toward the old-new outbreak of cholera in a developing country. *Trop Med Infect Dis*, 8(4), 236. doi:10.3390/tropicalmed8040236
- Aldahmash, A., Almutairi, S. (2023). The extent of incorporating health education requirements in middle school science textbooks. *Sustainability*, 15(14), 11005. doi:10.3390/su151411005
- Altunışık, R., Coşkun, R., Bayraktaroğlu, S., Yıldırım, E. (2010). Sosyal bilimlerde araştırma yöntemleri (SPSS uygulamalı). In: Pegem Akademi, 7-253.
- Babaoğlu, Ü., Demir, G. (2017). Knowledge about Brucella in semi-urban regions. *Acıbadem Univ Health Sci J*, 4, 214-219. doi:10.22391/920.256692
- Barlett, J.E., Kotrlık, J.W., Higgins, C.C. (2001). Organizational research: determining appropriate sample size in survey research. *Inf Technol Learn Perform J*, 19(1), 43-50. <https://www.opalco.com/wp-content/uploads/2014/10/Reading-Sample-Size1.pdf>
- Demir, C., Yıldız, H., Yürektürk, Ş. (2020). Van Yüzüncü Yıl University vocational school of health services students' knowledge level on infectious diseases. *Van Med J*, 27(4), 458-465. doi:10.5505/vtd.2020.74875
- Ebrahimi, B., Nazarinia, M., Molayem, M., Jokar, M.J., Nemati, M. (2023). Assessment of knowledge, attitude and practices (KAP) towards COVID-19 and the risks of SARS-CoV-2 infection among the Iranian EMS workers: an online cross-sectional survey. *Air Med J*, 42, 271-275. doi:10.1016/j.amj.2023.04.007
- Ener, D., Seyfeli, Y., Çetinkaya, F. (2022). A scale development and validation study: communicable diseases risk awareness and protection scale. *J Istanbul Fac Med*, 85(2), 258-269. doi:10.26650/IUITFD.973903
- Esposito, S. (2016). Infectious diseases: pathophysiology, diagnostics and prevention. *Int J Mol Sci*, 17(9), 1464. doi:10.3390/ijms17091464
- Filip, R., Gheorghita Puscaselu, R., Anchidin-Norocel, L., Dimian, M., Savage, W.K. (2022). Global challenges to public health care systems during the COVID-19 pandemic: a review of pandemic measures and problems. *J Pers Med*, 12(8), 1295. doi:10.3390/jpm12081295
- Hussein, M., Khalil, M. (2020). Assessment of primary schools teachers' knowledge and attitudes toward communicable diseases prevention and control at primary schools. *Indian J Forensic Med Toxicol*. doi:10.37506/ijfmt.v14i2.3040
- Islami, R. (2023). Covid-19 prevention intentions of pre-science science teachers from South African and Indonesian universities. *Eurasia J Math Sci Technol Educ*, 19(8), em2305. doi:10.29333/ejmste/13426
- Karimi-Sari, H., Bayatpoor, M., Khotbesara, M., Ebrahimi, M., Sattari, Z., Sattari, P., et al. (2017). Knowledge, attitude, and practice of Iranian health sciences students regarding hepatitis B and C virus infections: a national survey. *Am J Infect Control*, 45(11), e135-e141. doi:10.1016/j.ajic.2017.07.012
- Kerr, A., Hughes, C. (2023). Midwives' and women's understanding of cytomegalovirus infection during pregnancy. *Br J Midwifery*, 31(5), 268-276. doi:10.12968/bjom.2023.31.5.268
- Kurt, A.S., Yılmaz, S.D. (2012). The levels of knowledge and sources of information on HIV/AIDS of university health science students. *J Educ Res Nurs*, 9(3), 47-52. https://jag.journalagent.com/jern/pdfs/JERN_9_3_47_52.pdf
- Miller, N., Wick, J., Luther, V.P., Newman, J.R. (2023). Online Infectious Diseases Subspecialty Supplementary Curriculum for Medical Students and Residents: Moving Beyond "You Get What You Get". *J Med Educ Curric Dev*. Apr 26;10:23821205231171206. doi: 10.1177/23821205231171206. PMID: 37123078; PMCID: PMC10134105.
- Nii-Trebi, N.I. (2017). Emerging and neglected infectious diseases: insights, advances, and challenges. *Biomed Res Int*, 2017, 5245021. doi:10.1155/2017/5245021
- Patja, K., Veld, T., Arva, D., Bonello, M., Pees, R., Soethout, M., et al. (2022). Health promotion and disease prevention in the education of health professionals: a mapping of European educational programmes from 2019. *BMC Med Educ*, 22(1). doi:10.1186/s12909-022-03826-5
- Shravani, R. (2018). Awareness of risk factors for non-communicable diseases among adolescent girls aged 15-17 years in Koti, Hyderabad. *J Med Sci Clin Res*, 6(4). doi:10.18535/jmscr/v6i4.124
- Solmaz Avcıkurt, A. (2014). Evaluation of knowledge and

- attitudes on HIV/AIDS of Balıkesir University students. *Balıkesir Health Sci J*, 3(2), 79-86. doi:10.5505/bsbd.2014.83703
- Suryasa, W., Rodríguez-Gómez, M., Herrera-Velázquez, M., Koldoris, T. (2022). Health education programs and their importance for disease prevention and health promotion. *Int J Health Sci*, 6(3):xi-xv. doi:10.53730/ijhs.v6n3.13788
- Taştan, R., Altıntaş, L., Cevizci, S. (2016). The determination of knowledge level of nurses working in the hospitals in the center of Kocaeli province about the zoonotic diseases. *Turk Bull Hyg Exp Biol*, 73(4), 365-78. doi:10.5505/TurkHijyen.2016.62134
- Tulchinsky, T.H., Varavikova, E.A. (2014). Communicable diseases. *The New Public Health*, 149-236. doi:10.1016/B978-0-12-415766-8.00004-5
- Wang, M., Han, X., Fang, H., Xu, C., Lin, X., Xia, S., et al. (2018). Impact of health education on knowledge and behaviors toward infectious diseases among students in Gansu Province, China. *Biomed Res Int*, 1-12. doi:10.1155/2018/6397340
- World Health Organization. (2020). Communicable disease. Available at: https://apps.who.int/gb/ebwha/pdf_files/WHA73/A73_24-en.pdf [Last accessed: May 2023]
- World Health Organization. (2023). Coronavirus (COVID-19) Dashboard. Available at: <https://COVID19.who.int/> [Last accessed: May 2023]