

# THE EFFECT OF MASK-DISTANCE-HYGIENE MEASURES ON NON-COVID-19 VIRAL UPPER RESPIRATORY TRACT DISEASES

MASKE-MESAFE-HİJYEN UYGULAMALARININ COVID-19 DIŞI VİRAL ÜST SOLUNUM YOLU HASTALIKLARINA ETKİSİ

 BİLGE AKGÜNDÜZ<sup>1</sup>  ANIL UÇAN<sup>2</sup>  LEVENT ÖZDEMİR<sup>3</sup>

<sup>1</sup>Health And Occupational Diseases Clinic, Eskişehir City Hospital, Eskişehir, Türkiye

<sup>2</sup>Internal Medicine Clinic, Eskişehir City Hospital, Eskişehir, Türkiye

<sup>3</sup>Chest Diseases Clinic, Samsun Training And Research Hospital, Samsun, Türkiye

## ABSTRACT

**Aim:** This study aimed to investigate the effects of mask-distance and hand hygiene measures on non-COVID-19 viral upper respiratory tract infections during the pandemic period.

**Methods:** The study was designed as a cross-sectional survey study. Patients and their relatives presenting to the chest diseases outpatient clinic were asked by questionnaire about symptoms and signs of seasonal viral upper respiratory tract infections other than COVID-19 before the pandemic and during the first year of the pandemic.

**Results:** The mean age of the 322 participants was 44.5±15.4 years. 177 (55%) of the participants were women. One hundred thirty-three of the participants had no Upper Respiratory Tract Infection (URTI) history before and after the pandemic. In the pre-pandemic period, the rate of participants admitted to the hospital due to URTI was 1.28 times higher compared to the pandemic period. 34.8% of the participants had not had URTI before COVID-19. 19.6% of these cases had URTI during the pandemic period. The rate of those who had URTI before the pandemic was higher than those who had URTI after the pandemic, and this was statistically significant (p:0.001).

**Conclusion:** Mask wearing has a major impact on the spread of respiratory viral pathogens and disease prevention. Especially during the seasons when these pathogens occur, ensuring the continued use of mask-distance-hand hygiene rules during the post-pandemic period in the community is a simple and effective method of disease prevention.

**Keywords:** COVID-19, viral upper respiratory tract infections, mask, distance, hand hygiene

## ÖZET

**Amaç:** Bu çalışmada pandemi döneminde uygulanan maske, mesafe ve el hijyeni uygulamalarının COVID-19 dışı üst solunum yolu viral enfeksiyonlarına etkisinin araştırılması amaçlanmıştır.

**Yöntemler:** Araştırma kesitsel anket araştırması olarak dizayn edildi. Göğüs hastalıkları kliniğine başvuran hasta ve hasta yakınlarına pandemi öncesi ve pandemi döneminde ilk bir yıl içerisinde COVID-19 dışı mevsimsel viral üst solunum yolu enfeksiyonu semptom ve bulgularının sorgulandığı bir anket uygulandı.

**Bulgular:** 322 katılımcının yaş ortalaması 44.5±15.4 idi. Katılımcıların 177'si (%55) kadındı. 133 katılımcı pandemi öncesi ve sonrası Üst Solunum Yolu Enfeksiyonu (ÜSYE) geçirmemişti. Pandemi öncesi dönemde, pandemi dönemine göre ÜSYE nedeniyle hastaneye başvuranların oranı 1.28 kat daha fazlaydı. Katılımcıların %34.8'i COVID-19 öncesi ÜSYE geçirmemişti. Bu olguların %19.6'sı pandemi döneminde ÜSYE geçirmişti. Pandemi öncesi ÜSYE geçirenlerin oranı pandemi sonrası ÜSYE geçirenlere göre daha yüksekti ve bu istatistiksel olarak anlamlıydı. (p:0.001).

**Sonuç:** Maske kullanımı solunumsal viral patojenlerin yayılmasında, hastalığın önlenmesinde etkili olmuştur. Özellikle bu patojenlerin görüldüğü mevsimlerde pandemi sonrasında da maske-mesafe-el hijyeni kurallarının toplumda uygulanmasının sürekliliğinin sağlanması hastalıkların önlenmesinde basit ve etkili yöntemlerdir.

**Anahtar Sözcükler:** COVID-19, viral üst solunum yolu enfeksiyon, maske, mesafe, el hijyen

## INTRODUCTION

COVID-19 was declared a public health emergency by the World Health Organization (WHO) on March 11, 2020 (1). Measures have been taken to prevent the spread of the disease worldwide, and vaccines have been developed to prevent the disease (2). Since the beginning of the pandemic, keeping social distance, wearing masks, and washing hands to prevent the spread of coronavirus have become the basic rules that people want to apply both in our country and around the world. As with COVID-19,

transmission of many infectious agents that cause upper respiratory tract infections occurs primarily through the airway (3).

Polymerase Chain Reaction testing is routinely used to diagnose coronavirus in the COVID-19 pandemic (4). Diagnosis of other viral upper respiratory tract infections can usually be made based on the patient's symptoms, physical examination findings, and rarely laboratory findings (5). Therefore, rapid tests are not routinely used to screen for or diagnose seasonal viral upper

**Corresponding author:** Bilge Akgündüz, Health and Occupational Diseases Clinic, Eskişehir City Hospital, Eskişehir, Türkiye

**E-mail:** bilgeuzmezoglu@hotmail.com

**ORCID:** <https://orcid.org/0000-0002-9398-5173>

**Received date:** 11.05.2024 **Accepted date:** 12.07.2024

**Cite as:** Akgündüz B, Uçan A, Özdemir L. The Effect of Mask-Distance-Hygiene Measures on Non-COVID-19 Viral Upper Respiratory Tract Diseases. *Eskisehir Med J.* 2024; 5(2): 73-77. doi: 10.48176/esmj.2024.164.

respiratory tract infections in the general population. The prevalence of viral pathogens in the population in other seasons is not clearly known. Influenza A and B, one of the seasonal flu pathogens, have caused epidemics and pandemics in different periods. In 2009, it was reported that the total number of deaths due to acute respiratory distress syndrome caused by influenza A virus leading to a pandemic was 18,449 (6). The annual number of deaths from influenza-related respiratory diseases is estimated to be approximately 650,000 (7). Compared with other seasonal flu pathogens, the transmission rate and mortality rate of COVID-19 were found to be higher (8). Therefore, more stringent measures such as mask-distance and hand hygiene (MDH), isolation, and quarantine practices have been adopted to prevent the spread of the virus compared with other pandemics. The incidence of pathogens other than COVID-19 that cause respiratory transmission is expected to decrease with the use of masks. Although the U.S. Centers for Disease Control and Prevention reports that influenza declines during the pandemic season, it is not clear whether respiratory diseases caused by viral pathogens such as adenoviruses, influenza, rhinoviruses, and respiratory syncytial viruses decline during the spring and winter seasons (9).

With this study, we aimed to investigate the impact of mask-distance-hand hygiene, which is part of the measures to prevent the spread of the virus by the pandemic COVID-19, on other non-COVID-19-URTI.

## MATERIAL AND METHODS

In this study, the data of 322 patients over 18 years of age who were literate and admitted to the Outpatient Clinic for Chest Diseases of Eskişehir City Hospital and Hatay Dörtyol State Hospital for various complaints between June 2021 and August 2021 and whose written informed consent was obtained to participate in the study were analyzed. The study was designed as a cross-sectional study. To investigate the influence of mask-wearing on other viral respiratory infections during the pandemic COVID-19, data were collected for the pre-pandemic period COVID-19 and for the 1-year period of the pandemic COVID-19 using a questionnaire. The survey forms were completed under the supervision of a nurse, without time restrictions. It was stated that the information obtained from the survey would be used only for scientific purposes and they were asked to answer the survey while keeping their identity information confidential. Whereas the first part of the questionnaire contained demographic information, the second part consisted of 9 questions designed to determine whether the patient had seasonal flu or a cold or upper respiratory tract infection, the patient's hospital admissions and hospitalization history, admission symptoms, and history of drug use during the pre-pandemic period and during the 1-year period of the pandemic.

Ethical approval for this study was obtained from the Ethics Committee of Eskişehir Osmangazi University for Noninvasive Clinical Research (Decision and date no: 15.06.2021 /21).

## Statistical Analysis

Statistical Package for the Social Sciences for Windows version 15.0 (SPSS Inc., Chicago, IL, USA) was used to analyze the data. Descriptive categorical data were expressed as counts and percentages. The chi-square test was used to compare categorical data. A p-value of < 0.05 was accepted as statistically significant.

## RESULTS

The mean age of the 322 participants who responded to the survey was  $44.46 \pm 15.36$  years. 177 (55%) of participants were women. 167 (51.9%) of participants in the 1-year pre-pandemic period and 140 (43.5%) of participants in the 1-year post-pandemic period reported having an upper respiratory tract infection. Of the participants, 132 (41%) reported hospital admission for upper respiratory tract infection before the pandemic and 103 (32%) during the pandemic period. During the pre-and post-pandemic periods, the most common symptoms of viral URTI were fatigue and malaise (n:106 [32.9%] vs. (n:89 [21.4%])). Other common complaints of participants were listed as follows: Sore throat (n:90 [28.0%] vs. n:68 [21.1%]), joint and muscle pain (n:77 [23.9%] vs. n:69 [21.4%]), cough (n:79 [24.5%] vs. n:61 [18.9%]), runny nose (n:73 [22.7%] vs. n:53 [16.4%]), and sneezing (n:61 [18.9%] vs. n:55 [17.1%]). The least common complaints were shortness of breath, fever, and hoarseness. It was observed that participants had fewer non-COVID-19-URTI complaints during the pandemic period. During the pandemic period, the rate of those taking medication for non-COVID-19-URTI was lower than during the pre-pandemic period (38.6% [n:125] vs. 48.7% [n:157]). The number of participants hospitalized for non-COVID-19-URTI was also lower during the pandemic period (3.4% [n:3] before the pandemic, 2.8% [n:9] during the pandemic).

One hundred thirty-three of participants had non-COVID-19-URTI before and after the pandemic. 34.8% of the participants had not had URTI before COVID-19. 19.6% of these cases had URTI during the pandemic period. The rate of those who had URI only before the pandemic was higher than those who had URTI only after the pandemic, and this was statistically significant (p:0.001). Of those who had not taken medication for a URTI before the pandemic, 17 took medication during the pandemic, while the number who took medication before the pandemic was 48 (p:0.001) (Table 1).

## DISCUSSION

The effects of mask-distance and hand hygiene

**Table 1.** Comparison of other viral upper respiratory tract infection symptoms, medication use, hospitalization history and hospital admissions of the participants in the 1 year before the pandemic and 1 year after the pandemic.

	1 year before the pandemic (n, %)		1 year after the pandemic (n, %)	
	Yes	No	Yes	No
Have you ever had the seasonal flu or cold or upper airway infection?	167 (%51,9)	155 (%48,1)	140 (%43,5)	182 (%56,5)
Have you been admitted to the hospital due to viral upper respiratory tract infection symptoms?	132 (%41)	190 (%59)	103 (%32)	219 (%68)
Hospitalization due to viral upper respiratory tract infection?	11 (%3,4)	311 (%96,6)	9 (%2,9)	311 (%97,2)
Have you used medication for viral upper respiratory tract complaints?	157 (%48,8)	165 (%51,2)	125 (%38,8)	197 (%61,2)
Viral upper respiratory tract symptoms	106 (%32,9)	216 (%67,1)	89 (%27,6)	233 (%72,4)
Fatigue-Misery	90 (%28)	232 (%72)	68 (%21,1)	254 (%78,9)
Chest pain	79 (%24,5)	243 (%75,5)	61 (%18,9)	261 (%81,1)
Cough	77 (%23,9)	245 (%76,1)	69 (%21,4)	253 (%78,6)
Joint and muscle pain	73 (%22,7)	249 (%77,3)	53 (%16,5)	269 (%83,5)
Runny nose	61 (%18,9)	261 (%81,1)	55 (%17,1)	267 (%82,9)
Sneeze Fever	32 (%9,9)	290 (%90,1)	25 (%7,8)	297 (%92,2)
Hoarseness	31 (%9,6)	291 (%90,4)	28 (%8,7)	294 (%91,3)
Shortness of breath	24 (%7,5)	298 (%92,5)	26 (%8,1)	296 (%91,9)

measures on non-COVID-19-URTI were not studied before the pandemic COVID-19. Although mask-distance and hand hygiene were recommended in some countries during the new influenza A virus pandemic in 2009, these measures were not consistently used or mandated in the population (10). After COVID-19 was declared a pandemic by WHO, mask use became mandatory in Turkey. In our study examining the impact of MDH use on non-COVID-19-URTIs, we found that MDH measures reduced the incidence of non-COVID-19-URTI and hospital admission. Although it has been reported that even the use of a mask alone prevents the spread of respiratory viral pathogens because of its physical barrier (11), the effectiveness of enveloped viruses decreases with the use of soap, which is one of the hand hygiene practices (12). The widespread use of cologne as a disinfectant during the pandemic is another hygiene method that prevents the spread of viruses from person to person by providing fixation (13). In addition to the use of masks, other measures are also effective in reducing the incidence of non-COVID-19-URTI.

It has been reported that during the COVID-19 pandemic in the United States, the frequency of emergency department visits for other viral respiratory diseases and the frequency of asthma and COPD exacerbations decreased (15). Also, in our survey study, the number of participants who visited the hospital during the pandemic and received drug treatment for non-COVID-19-URTI was lower than before the pandemic. It is likely that curfews during the first year of the pandemic played a role. However, during the pandemic, people continued to live in many different crowded work environments where production continued, such as

factories, and where MDH regulations were enforced. In addition, in our study, the mean age of participants was well below 65 years, and the number of participants who were prohibited from going out was small. Although the impact of curfews on decreases in hospital admissions due to non-COVID-19-URTI is not clearly known, our study suggested that MDH measures are effective independent of curfews.

Regardless of whether mask alone or MDH rules are used together, the incidence or transmission of other viral respiratory diseases seen at COVID-19 can be reduced with these simple measures. Preventing person-to-person transmission of communicable diseases provides direct and indirect public health protection. It can be said that health protection primarily protects the individual's health and thus the public health. On the other hand, it can be referred to as the prevention of diseases and deaths due to viral URTI diseases. Indirectly, it can be assumed that compliance with the rules of MDH can also help to reduce the cost of diagnosis and treatment of viral diseases. Because mask use is the most visible and measurable best practice under MDH regulations, mandatory mask use by governments during the seasonal flu season will also help prevent or reduce viral respiratory infections. MacIntyre et al. have shown that using masks, especially N95 masks, prevents viral and bacterial airway colonization and effectively protects against respiratory tract infection(16). It was determined that with the improved Infection Prevention and Control measures implemented during the COVID-19 period, the cumulative incidence of Healthcare Worker-Associated Viral Pathways Diseases decreased from 9.69 cases per 10,000 patient days to 0.83 cases per 10,000

patient days (17). In addition, MMH applications are considered a cost-effective method to prevent respiratory diseases (18,19).

Our study was a survey study and had some limitations. One of them is recall bias, but we studied the one-year period before and during the pandemic to avoid it. At the same time, we believe that the recall bias problem may be less pronounced among participants because there is a constant flow of information about social media and news broadcasts or viruses and protection methods in daily life due to the pandemic. Another limitation of our study was that, in accordance with the Personal Information Privacy Law, participants' hospital admission records did not contain identification numbers that we could use to access them, and we could not compare them with hospital records. Therefore, we could not compare the frequency of emergency department admission and hospitalization.

## CONCLUSION

Although the decrease in non-COVID-19-URTI infections in the first year of the pandemic suggests that this may be related to the implementation of MDH requirements, comparing the frequency of seasonal flu infections with other studies in 2021, when some precautions against the virus have been relaxed with the COVID-19 vaccine but the mask is still mandated, will allow a clearer determination of the effectiveness of the mask alone.

**Ethics Committee Approval:** This study was obtained from the Ethics Committee of Eskişehir Osmangazi University for Noninvasive Clinical Research (Decision and date no: 15.06.2021/21).

**Informed Consent:** Informed consent was provided from all patients who wanted participated in the study.

**Authorship Contributions:** Idea/Concept: BA, AÇ, Design: BA, AÇ, LÖ, Supervision: BA, AÇ, LÖ, Data Collection or Processing: BA, AÇ, LÖ, Analysis or Interpretation: BA, LÖ, Literature Search: BA, AÇ, LÖ, Writing: BA, AÇ, LÖ, Critical Review: BA, AÇ, LÖ, References And Fundings: -, Materials: -.

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declare that they have no relevant financial.

## REFERENCES

- 1.Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. *Acta Biomed* 2020;91:157-60.
- 2.Lopez Bernal J, Andrews N, Gower C, et al. Effectiveness of the Pfizer-BioNTech and Oxford-AstraZeneca vaccines

on covid-19 related symptoms, hospital admissions, and mortality in older adults in England: test negative case-control study. *BMJ* 2021;373:1088-99.

- 3.Kutter JS, Spronken MI, Fraaij PL, Fouchier RA, Herfst S. Transmission routes of respiratory viruses among humans. *Curr Opin Virol* 2018;28:142-51.
- 4.Tang YW, Schmitz JE, Persing DH, Stratton CW. Laboratory diagnosis of COVID- 19: current issues and challenges. *J Clin Microbiol* 2020;58:512-20.
- 5.Talbot HK, Falsey AR. The diagnosis of viral respiratory disease in older adults. *Clin Infect Dis* 2010;50:747-51.
- 6.Tselios K, Tsioka R, Sarantopoulos A, Mouloudi E, Boura P. Influenza A/H1N1 septic shock in a patient with systemic lupus erythematosus. A case report. *BMC Infect Dis* 2011;11:358-62.
- 7.Iuliano AD, Roguski KM, Chang HH, et al. Global seasonal influenza-associated mortality collaborator network. Estimates of global seasonal influenza-associated respiratory mortality: a modelling study. *Lancet* 2018;391:1285-300.
- 8.Jeganathan N, Grewal S, Sathananthan M. Comparison of deaths from COVID-19 and seasonal influenza in the USA. *Lung* 2021;199:559-61.
- 9.Olsen SJ, Azziz-Baumgartner E, BuddAP, et al. Decreased influenza activity during the COVID-19 pandemic — United States, Australia, Chile, and South Africa, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:1305–09.
- 10.SteelFisher GK, Blendon RJ, Bekheit MM, Lubell K. The public's response to the 2009 H1N1 influenza pandemic. *N Engl J Med* 2010;362:e65-71.
- 11.Chu DK, Akl EA, Duda S, Solo K, Yaacoub S, Schünemann HJ. COVID-19 Systematic Urgent Review Group Effort (SURGE) study authors. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS- CoV-2 and COVID-19: a systematic review and meta-analysis. *Lancet* 2020;395:1973-87.
- 12.Grayson ML, Melvani S, Druce J, Barr IG, Ballard SA, Johnson PD. Efficacy of soap and water and alcohol-based hand-rub preparations against live H1N1 influenza virus on the hands of human volunteers. *Clin Infect Dis* 2009;48:285-91.
- 13.Çelebi Sözen Z, Aydın Ö, Demirel YS, et al. Does the medical diagnosis of occupational asthma coincide with the legal diagnosis? *J Asthma* 2017;54:930-39
- 14.Çelebi H, Bahadır T, Şimsek İ, Tulun Ş. Coronavirus (COVID-19): What could be the environmental effects of disinfectant use in the pandemic? *Med. Sci. Forum* 2021;4: 27-34.
- 15.Dezman ZDW, Stryckman B, Zachrisson KS, et al. Masking for COVID-19 is associated with decreased emergency department utilization for non-COVID viral illnesses and respiratory conditions in maryland. *Am J Med* 2021;134:1247-51.
- 16.MacIntyre CR, Wang Q, Rahman B, et al. Efficacy of

face masks and respirators in preventing upper respiratory tract bacterial colonization and co-infection in hospital healthcare workers. *Prev Med* 2014;62:1-7.

17. Wee LEI, Conceicao EP, Tan JY, et al. Unintended consequences of infection prevention and control measures during COVID-19 pandemic. *Am J Infect Control* 2021;49:469-77.

18. Wang Y, Yang J, Qiao F, et al. Compared hand hygiene compliance among healthcare providers before and after the COVID-19 pandemic: A rapid review and meta-analysis. *Am J Infect Control* 2022;50:563-71.

19. Tchouaket NE, Beogo I, Sia D, et al. Economic analysis of healthcare-associated infection prevention and control interventions in medical and surgical units: systematic review using a discounting approach. *J Hosp Infect* 2020;106:134-54.



This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](https://creativecommons.org/licenses/by-nc-nd/4.0/).