

The Effectiveness of the PRECEDE-PROCEED Health Promotion Model to Decrease Fear, Anxiety, and Depression Among Healthcare Workers During a Pandemic: A Quasi-Experimental Study

Pandemide Sağlık Çalışanları Arasında Yayılan Korku, Anksiyete ve Depresyon Düzeyleri Üzerinde PRECEDE-PROCEED Sağlık Geliştirme Modeli'nin Etkinliği: Yarı Deneysel Araştırma

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ABSTRACT Objective: The objective of this study is to evaluate the effects of interventions based on the PRECEDE-PROCEED Health Promotion Model on the level of fear, anxiety, and depression related to COVID-19 among nurses and porters during the first wave of the COVID-19 pandemic.

Material and Methods: This study was conducted as a quasi-experimental study at a tertiary care pandemic hospital. Various interventions based on the PRECEDE-PROCEED Health Promotion Model were planned (education, personnel protective equipment support ... etc.) during the pandemic to decrease anxiety, depression, and fear of COVID-19. All nurses and porters were invited to the study via e-mail during the COVID-19 pandemic (n=716). The effectiveness of these interventions was assessed using the "Hospital Anxiety and Depression Scale," "Fear of COVID-19 Scale," and "COVID-19 Phobia Scale." **Results:** Four hundred fifty-one healthcare professionals agreed to participate in the study. All nurses and porters who were included in the interventions and completed both the pre-test and post-test were included in the analysis (n=87). The research initiatives are statistically effective in reducing the level of fear (2.55 vs 2.10, p<0.001), anxiety (2.51 vs 2.11, p<0.001), and depression (2.44 vs 2.22, p<=0.010) spread among healthcare workers working during the COVID-19 pandemic.

Conclusion: Hospital managers should plan simple and effective initiatives to increase the well-being of healthcare workers by reducing their anxiety, depression and fear levels during pandemics. The PRECEDE-PROCEED Health Promotion Model is one of the most effective models in planning these initiatives.

ÖZET Amaç: Bu çalışmanın amacı, koronavirüs hastalığı-2019 [coronavirus disease-2019 (COVID-19)] pandemisinin ilk dalgasında hemşire ve portörler arasında yayılan korku, anksiyete ve depresyon düzeyleri üzerinde PRECEDE- PROCEED Sağlık Geliştirme Modeli'ne uygun planlanan araştırma girişimlerinin etkinliğini değerlendirmektir. **Gereç ve Yöntemler:** Çalışma 300 yatak kapasiteli bir pandemi hastanesinde, yarı deneysel araştırma esaslarına uygun olarak yürütülmüştür. Araştırma kapsamında sağlık çalışanları arasında yayılan korku, anksiyete ve depresyon düzeylerini düşürmek amacıyla PRECEDE-PROCEED Sağlık Geliştirme Modeli esaslarına uygun bir dizi girişim planlanmıştır. COVID-19 pandemisinin ilk dalgasında hastanede görev yapan, girişimlere dâhil olan tüm hemşire ve portörler (n=716) e-posta ile çalışmaya davet edildi. Araştırma girişimlerinin etkinliği, geçerliği ve güvenilirliği sağlanmış "Hastane Anksiyete ve Depresyon Ölçeği", "COVID-19 Korku Ölçeği" ve COVID-19 Fobi Ölçeği" ile değerlendirilmiştir. **Bulgular:** Araştırmaya katılmak için 451 sağlık çalışanı gönüllü oldu. Planlanan girişimlere dâhil olan, ön-test ve son-testi tamamlayan 87 çalışanın verileri analize dâhil edildi. PRECEDE-PROCEED Sağlık Geliştirme Modeli'ne uygun olarak planlanan girişimlerinin (eğitim, kişisel koruyucu ekipman desteği, izolasyon hazırlık alanlarının düzenlenmesi, hastane yöneticilerinin günlük kat ziyaretleri vb.) COVID-19 pandemisinde görev yapan sağlık çalışanları arasında yayılan korku (2,55/2,10, p<0,001), anksiyete (2,51/2,11, p<0,001) ve depresyon (2,44/2,22, p<=0,010) düzeyini istatistiksel olarak anlamlı derecede düşürdüğü tespit edildi. **Sonuç:** Pandemi döneminde sağlık çalışanlarının anksiyete, depresyon ve korku düzeylerini azaltarak; iyilik hallerini artırmak için hastane yöneticileri araştırmacılar ve bakanlık yetkililerinin desteğini alarak basit ve etkili girişimler planlanmalıdır. Bu girişimlerin planlanmasında, PRECEDE-PROCEED Sağlık Geliştirme Modeli en etkili modellerden biridir.

Keywords: COVID-19; health personnel; health promotion; pandemics

Anahtar Kelimeler: COVID-19; sağlık personeli; sağlığın geliştirilmesi; pandemi

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Healthcare workers (HCWs) are at the highest risk of coronavirus disease-2019 (COVID-19) infection due to their close and extended contact with patients with COVID-19.¹ Several studies have shown that HCWs are more likely to experience severe COVID-19 compared to other workers, with nurses being reported as having the highest risk of acquiring severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) infection in studies from the UK, China, and Italy.²⁻⁵ Furthermore, studies have also highlighted the risk faced by porters, who are caregivers in healthcare settings, like nurses.⁶⁻⁸

The COVID-19 pandemic has had a deep influence on healthcare professionals. According to the International Council of Nurses and World Health Organization (WHO), 115,000 HCWs died within the first ten months of the pandemic.^{9,10} Apart from the risk of death, healthcare professionals also face psychological effects such as anxiety, depression, fear, and stress in their work and daily lives.^{11,12} According to the WHO, anxiety, depression, and stress are the most common mental health disorders during the pandemic.¹³

These issues are often associated with loss of interest, low mood, guilt, worthlessness, sleep disturbances, appetite changes, decreased energy, impaired concentration, reduced job satisfaction, difficulties in personal relationships, and even suicidal thoughts.¹⁴ Unfortunately, well-organized interventions based on the healthcare promotion model that can alleviate these psychological symptoms are still not widely implemented in healthcare settings.¹⁵

The PRECEDE-PROCEED model provides a wide-ranging framework to evaluate health needs and designing, applying, and assessing health promotion programs. The Predisposing Reinforcing and Enabling Constructs in Educational Diagnosis and Evaluation (PRECEDE) phase establishes the structure for planning a targeted and focused public health program. The PROCEED Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development (PROCEED) phase provides guidance for program implementation and evaluation.¹⁶ The model considers various factors that influence health status and helps planners identify

specific factors as targets for intervention.¹⁷ Impressive studies have demonstrated that this model can lead to improvements in patients' psychological health.¹⁸⁻²⁰ Moreover, the model is valuable as it facilitates gaining management support during the study. In summary, the PRECEDE-PROCEED model can serve as a guide to reduce anxiety, depression, and fear among HCWs during pandemics.

Aim

This quasi-experimental study conducted a pre-test and post-test design to evaluate the effects of interventions based on the PRECEDE-PROCEED Health Promotion Model on reducing levels of COVID-19 fear, anxiety, and depression among HCWs during the first wave of the COVID-19 pandemic.

Hypotheses

H0: The intervention series based on the PRECEDE-PROCEED Health Promotion Model is not effective on the levels of COVID-19 fear, anxiety, and depression among nurses and porters during the first wave of the pandemic.

H1: Effective planned interventions based on the PRECEDE-PROCEED Health Promotion Model are effective on the levels of COVID-19 fear, anxiety, and depression among nurses and porters during the first wave of the pandemic.

MATERIAL AND METHODS

STUDY DESIGN

This study was designed according to the principles of quasi-experimental study (non-randomized, pre-test and post-test design).

SETTING

The study was conducted at a tertiary care pandemic hospital located in İstanbul. The total number of HCWs in this hospital was 1,302.

STUDY POPULATION AND PARTICIPANTS

All nurses and porters over the age of 18, working in COVID-19 units (including 4 intensive care units, 1 emergency department, and 3 inpatient wards) as well as other departments, were invited to participate in

the study via e-mail (n=716). The email provided information about the study's aim and the expectations from participants, including their voluntary participation, involvement in interventions, and completion of pre-test and post-test surveys. A total of 451 nurses and porters voluntarily agreed to participate in the research. The study interventions, designed according to the PRECEDE-PROCEED Health Promotion Model, were implemented on these volunteer HCWs (nurses and porters). Subsequently, the data collected from the nurses and porters who participated in the interventions and completed the study surveys were analyzed (Figure 1).

STUDY DESIGN

The study interventions that were developed based on the guidance of the PRECEDE-PROCEED Health Promotion Model and implemented during the study are illustrated in Figure 2.

THE STUDY INTERVENTIONS

The study interventions were designed in accordance with the components of the PRECEDE-PROCEED Health Promotion Model. The first step was started with the training modules that started on February 15, just before the first case was seen in our hospital. These educational modules aimed to provide comprehensive information to all participants about the SARS-CoV-2 virus, preventive measures, and available treatment options. Additionally, the goal was to alleviate psychiatric symptoms such as anxiety, de-

pression, fear, and COVID-19 phobia among HCWs. The education section covered topics such as the definition of COVID-19, infection prevention measures (including isolation, social distancing, and hygiene practices), proper use of personal protective equipment (PPE) through practical training, cleaning and disinfection procedures, sampling techniques, and waste management protocols. The education sessions were conducted in 6 different settings, and the content was tailored to the specific professional roles of the HCWs. These sessions were completed before the first COVID-19 case was detected in Türkiye, allowing for face-to-face meetings.

One researcher (BM) delivered all the education modules, which had an average duration of approximately 40 minutes. To support the education section, brochures and posters were placed in various areas of the hospital, providing additional information and reinforcement of the key messages conveyed during the educational sessions. These training materials (brochures and posters) prepared by four different infection control experts (2 infection control nurses and 2 infectious diseases physicians), aimed to enhance understanding and retention of training content among HCWs.

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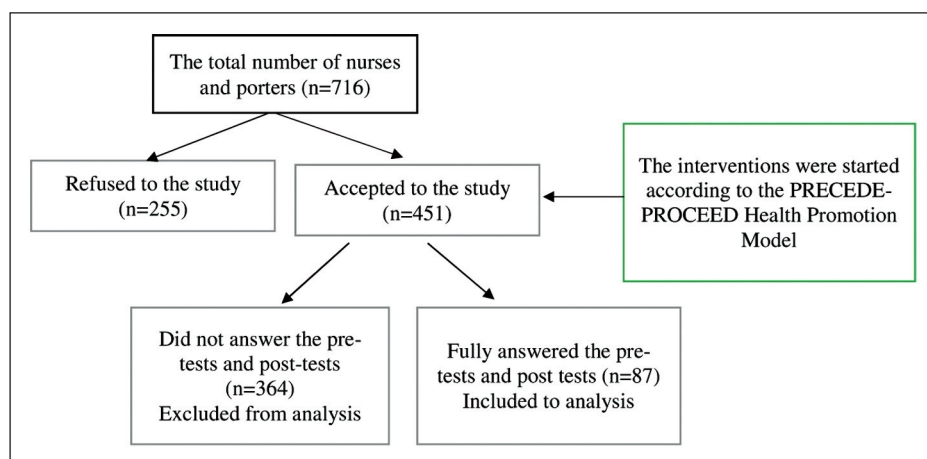


FIGURE 1: The study flow.

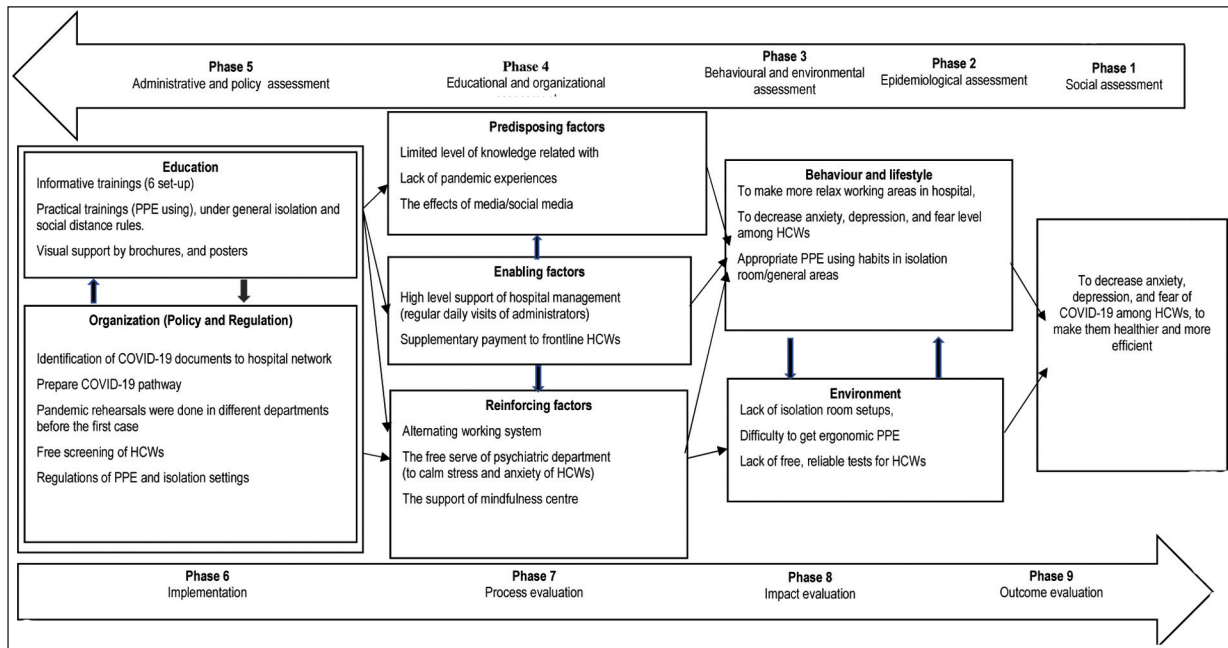


FIGURE 2: The study framework based on PRECEDE-PROCEED Health Promotion Model to decrease anxiety, depression, and fear among healthcare works in a pandemic.

PPE: Personal protective equipment; HCWs: Healthcare workers.

inforcement of the key messages conveyed during the educational sessions. The use of brochures and posters aimed to enhance the understanding and retention of the educational content among HCWs.

The second part of the intervention focused on organizational measures. The researchers developed documents and clinical pathways based on the current literature to provide guidance for HCWs. Practical rehearsals were conducted in different areas of the hospital to ensure that HCWs were well-prepared to handle the pandemic. The Occupational Health and Safety Department monitored HCWs for any signs and symptoms of COVID-19, and all diagnostic and screening processes were provided free of charge for HCWs. Sufficient quantities and varieties of PPE were supplied, and isolation settings were organized in various departments of the hospital to ensure easy access to PPEs in different areas.

To enhance enabling factors, hospital administrators made regular daily visits to provide psychological support to HCWs. Additional payments were given to frontline HCWs as a form of recognition. Furthermore, researchers and hospital administrators reorganized certain procedures to provide reinforce-

ment. For example, working shifts were restructured with one-week intervals of absence. The psychiatry department offered individual meetings with HCWs who were struggling with stress and anxiety related to the COVID-19 pandemic every wednesday. The hospital's mindfulness center organized sessions during lunch breaks, where a volunteer physician mindfulness trainer conducted 5-10 minutes of relaxation exercises for frontline HCWs at the beginning of their shifts in different hospital wards.

To ensure ethical considerations, the training modules were open to all willing employees. Other HCWs could also benefit from the rights provided within the scope of the study. However, only HCWs who participated in the study interventions and completed the pre-test/post-test scales were included in the evaluation phase.

Figure 2 illustrates the study framework based on the PRECEDE-PROCEED Health Promotion Model, aiming to decrease anxiety, depression, and fear among HCWs during the pandemic.

To evaluate the effectiveness of these interventions, two primary scales [The Hospital Anxiety and

Depression Scale (HADs) and The Fear of COVID-19 Scale] and one supplementary scale [The COVID-19 Phobia Scale (C19P-S)] were used to measure the levels of anxiety, depression, fear of COVID-19, and COVID-19 phobia among HCWs during the COVID-19 pandemic.

SCALES

HADs (Scoring): HADs consists of two subscales, one measuring anxiety, with seven items ($\alpha=0.85$), and another measuring depression with seven items ($\alpha=0.78$), which score separately. The patient answered each item on a 4-point (0-3) scale, so the possible scores ranged from 0 to 21 for each subscale, taking 2-5 minutes to complete. The HADS manual indicates that a score between 0 and 7 is “normal,” between 8 and 10, “mild,” between 11 and 14, “moderate,” and between 15 and 21, “severe”.²¹

The Fear of COVID-19 Scale (Scoring): The participants indicate their level of agreement with the statements using a five-item Likert-type scale ($\alpha=0.82$). Answers included “strongly disagree,” “disagree,” “neutral,” “agree,” and “strongly agree.” The minimum score possible for each question is 1, and the maximum is 5. A total score could be calculated by adding each item score (ranging from 7 to 35).²²

C19P-S (Scoring): C19P-S is a self-report instrument with a five-point Likert-type scale to assess the levels of COVID-19 phobia ($\alpha=0.92$). All items are rated on a 5-point scale from “strongly disagree (1)” to “strongly agree (5).” The scores on the scale can range between 20 and 100, and a higher score indicates more significant phobia in the respected subscales and total scale. The present study’s full-scale scores ranged from 20 to 100.²³

DATA COLLECTION

The data were collected by one researcher (BM) in two phases. The first data collection (pre-intervention) occurred between June 7 and June 27, 2020. The second data collection (post-intervention) was conducted between December 14 and December 28, 2020.

The study was conducted in accordance with the “Helsinki Declaration principles” and “research and publication ethics”. Ethical considerations were con-

sidered throughout the study. Ethical approval was obtained from the Koç University Clinical Research Ethics Committee (date: March 17, 2021; no: 2021.150.IRB1.054). The hospital management provided permission for data collection, ensuring the anonymity of all data. Participants were fully informed about the study procedures and the protection of their data. Written consent was obtained from all participants at the beginning of the study.

DATA ANALYSIS

In the data analysis phase, a quasi-experimental analysis was conducted to characterize the samples of HCWs. The suitability of the data for normal distribution was verified by Skewness and Kurtosis analysis. The prevalence of symptoms of anxiety, depression, fear, and phobia of COVID-19 was evaluated. To compare the psychological effects of HCWs based on gender, job position, and study area, the paired sample t-test was used. A statistical significance level of $p<0.05$ was considered. The statistical analyses were performed using SPSS Statistics for Macintosh, Windows, Version 28.0 Armonk, NY: IBM Corp.

It should be noted that participants who did not fully participate in the interventions and complete the scales were not included in the study, ensuring that the analysis is based on the data from participants who actively participated in the interventions and provided complete responses to the scales.

RESULTS

The study included a total of 451 healthcare professionals who fully participated in the study interventions and completed the pre-tests and post-tests. Among them, 87 HCWs (56 females and 31 males) were involved in all study interventions and provided complete data. The mean age of the participants was 31 years (range: 22-48) with a standard deviation of 7.09. Of the participants, 64 were nurses (74%), 23 were porters, and 30 HCWs (34%) worked in COVID-19 units. The participants’ years of working experience varied, with 10% having less than one year of experience, 25% having 1-5 years, 38% having 6-10 years, 15% having 11-20 years, and 12% having more than 21 years of experience.

The results of the study indicated that the “Fear of COVID-19 Scale” score significantly decreased during the study ($p < 0.001$). This decrease was observed among females ($p = 0.001$), males ($p = 0.048$), nurses ($p < 0.001$), and porters ($p = 0.001$). When considering the study area, the fear scale score significantly decreased in the non-COVID-19 units ($p < 0.001$), but the decrease in COVID-19 units was not significant ($p = 0.246$) (Table 1).

The “Fear of COVID-19 Scale” was supported by “C19P-S.” At the end of the study, the overall “C19P-S” score decreased among HCWs ($p = 0.001$), specifically among females ($p = 0.007$), males ($p = 0.027$), nurses ($p = 0.05$), porters ($p = 0.018$), and those who worked in both COVID-19 units ($p = 0.034$) and non-COVID-19 units ($p = 0.005$) (Table 1).

Regarding anxiety and depression, as measured by “HADs,” the score significantly decreased among HCWs from 2.47 to 2.17 ($p < 0.001$). This decrease was observed among females ($p = 0.024$) and males ($p < 0.001$), nurses ($p = 0.007$) and porters ($p = 0.001$), and HCWs who worked in COVID-19 units ($p = 0.003$) and non-COVID-19 units ($p = 0.005$, Table 2).

Analyzing the sub-scales of anxiety and depression, the anxiety sub-scale score decreased among females and males ($p = 0.002$, $p = 0.001$), nurses and porters ($p < 0.001$, $p = 0.005$), and those who worked in COVID-19 and non-COVID-19 units ($p = 0.006$, $p < 0.001$). The depression sub-score decreased among males ($p = 0.01$), porters ($p = 0.024$), and HCWs in COVID-19 units ($p = 0.016$), but the decrease among female nurses and HCWs in non-COVID-19 departments was not statistically significant ($p = 0.356$, $p = 0.190$, $p = 0.097$, respectively) (Table 2).

DISCUSSION

HCWs who work during the COVID-19 pandemic have the highest risk for infection because of close and extended contact with patients with COVID-19.¹ In addition, increased workload, physical exhaustion, and insufficient PPE might have intense effects on their physical and psychological well-being.²⁴ The studies highlight the importance of well-organized initiative strategies, appropriate planning, appropriate interventions, and leadership support for HCWs during the COVID-19 pandemic.^{25,26} Our institution started an intense study at the beginning of the COVID-19 pandemic based on the PRECEDE-

TABLE 1: COVID-19 Phobia, Fear of COVID-19 Scale scores before and after study interventions.

	Phobia †		p value	Fear of COVID-19 ‡		p value
	Before§	After¶		Before§	After¶	
All HCWs (n=87)	2.65	2.39	0.001	2.55	2.10	<0.001
Gender						
Female (66)	2.72	2.44	0.007	2.68	2.14	0.001
Male (31)	2.53	2.30	0.027	2.35	2.03	0.048
Position						
Nurse (64)	2.71	2.43	0.005	2.67	2.14	<0.001
Porters (23)	2.50	2.28	0.018	2.21	2.00	<0.001
Work unit						
COVID-19 (30)	2.55	2.37	0.034	2.36	2.16	0.246
Non-COVID-19 (57)	2.71	2.40	0.005	2.64	2.07	<0.001

Independent samples were evaluated by Paired simple t-test (parametric) and Wilcoxon rank-sum (nonparametric) test; †The mean of COVID-19 Phobia Scale; ‡Before the study interventions; §After the study interventions; ¶HCW: Healthcare workers.

TABLE 2: Hospital Anxiety and Depression Scale scores before and after study interventions.

	Anxiety [†]		p value	Depression [‡]		p value	Anxiety and depression [§]		p value
	Before [¶]	After [¶]		Before [¶]	After [¶]		Before [¶]	After [¶]	
All HCWs (87)	2.51	2.11	<0.001	2.44	2.22	0.010	2.47	2.17	<0.001
Gender									
Female (56)	2.59	2.24	0.002	2.45	2.35	0.356	2.52	2.30	0.024
Male (31)	2.51	2.11	0.001	2.44	2.01	0.010	2.39	1.94	<0.001
Position									
Nurse (64)	2.55	2.16	<0.001	2.43	2.30	0.190	2.49	2.23	0.007
Porters (23)	2.39	1.99	0.005	2.47	2.02	0.002	2.43	2.00	0.001
Work unit									
COVID-19 (30)	2.45	2.06	0.006	2.45	2.18	0.016	2.45	2.12	0.003
Non-COVID-19 (57)	2.54	2.14	<0.001	2.44	2.25	0.097	2.49	2.19	0.005

Independent samples were evaluated by Paired simple t-test (parametric) and Wilcoxon rank-sum (nonparametric) test; [†]The mean of anxiety sub score of anxiety and depression scale; [‡]The mean of depression sub score of anxiety and depression scale; [§]The mean of anxiety and depression scale; [¶]Before the study interventions; [¶]After the study interventions; HCW: Healthcare workers.

PROCEED health promotion model to reduce anxiety, depression, and fear among HCWs during the first wave of the COVID-19 pandemic.

At the end of this study, the overall “Fear of COVID-19 Scale”, “C19P-S”, and “HADs” scores were decreased, and results were statistically significant among HCWs (Table 1) (Table 2). This improvement occurred over time as additional interventions were released, modified, and disseminated during the study.

The COVID-19 phobia and fear levels were found to be decreased in males and females, nurses and porters who work during the COVID-19 pandemic (Table 1). However, the “Fear of COVID-19 Scale” score decrease was not statistically significant among HCWs who work in COVID-19 units (p=0.246) (Table 1). Our result was in parallel with the recent studies that reported that HCWs who work in COVID-19 units may still be afraid of being a carrier of the SARS-CoV-2 virus to their relatives.^{27,28}

Some studies found that nurses have high anxiety and depression prevalence rates during the COVID-19 pandemic.^{6,24} Shaukat et al. have shown that implementing physical and mental interventions may reduce the health burden among HCWs during the COVID-19 pandemic.²⁶ According to Fernandez et al. and Salari et al., nurses should actively be supported by leadership to fight against mental disorders; if not, nurses are likely to experience substantial psychological issues that can lead to burnout and lost workdays.^{14,29} In our study, with the help of study interventions, the HADs score, anxiety sub-scale score decreased among males and females, nurses and porters, and HCWs who work in COVID-19 units and out of COVID-19 units (Table 2). The overall depression sub-score decreased among all study groups, and the decrease was statistically significant among males, porters, and HCWs who work in COVID-19 units (p<0.05). However, the reduction in depression sub-score among females, nurses, and those who work out of COVID-19 teams was not statistically significant (p=0.356, p=0.190, p=0.097, respectively) (Table 2). Previous studies reported this result.^{24,27} Because depression level is more severe among nurses than the other healthcare professionals, these results may be partly confounded by the fact that nurses are primarily female but could also be attributed to the point. They

may face a greater risk of exposure to COVID-19 cases as they spend more time in units, provide direct care to patients, and are responsible for collecting sputum for virus detection.^{24,27,30} Moreover, with close contact with patients with COVID-19, they may be more exposed to psychological injury related to suffering, death, and ethical dilemmas.²⁴

The results of the study align with previous research emphasizing the higher prevalence of anxiety and depression among nurses during the COVID-19 pandemic. The increased risk of exposure, greater responsibility in patient care, and ethical dilemmas faced by nurses may contribute to their higher psychological burden. The interventions based on the PRECEDE-PROCEED model proved effective in addressing these psychological issues and supporting the well-being of HCWs.

It is worth noting that the study's strengths include its quasi-experimental design based on the health promotion model, a large sample size, and the willingness of HCWs to participate in the research. However, there are several limitations to consider. The study was conducted in a single centre, lacked a control group, and relied on voluntary participation, which may introduce selection bias. Additionally, the scales were not administered during the initial months of the pandemic when anxiety, depression, fear, and phobia levels were likely to be higher among HCWs. These limitations should be taken into account when interpreting the generalizability of the study's results.

CONCLUSION

The interventions implemented in this study based on the PRECEDE-PROCEED model, which included education, organizational support, leadership support, additional payment, mindfulness programs, and changes in the working system, were successful in reducing the levels of fear, anxiety, and depression

among HCWs working in different departments during the pandemic. These kinds of well-organized interventions should be planned by hospital managers with the help of researchers and the Ministry of Health to raise the well-being of HCWs. HCWs need to feel to be cared for by managers to be motivated during the pandemic. These kinds of basic interventions are simple and effective. These kinds of research that were made before and health promotion models will lead them during the pandemic. The PRECEDE-PROCEED Health Promotion Model is one of the most effective models that enable us to direct management support.

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Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Bahar Madran, Ayşe Beşer; **Design:** Bahar Madran; **Control/Supervision:** Bahar Madran, Önder Ergönül; **Data Collection and/or Processing:** Bahar Madran; **Analysis and/or Interpretation:** Bahar Madran, Önder Ergönül; **Literature Review:** Bahar Madran; **Writing the Article:** Bahar Madran, Ayşe Beşer, Önder Ergönül; **Critical Review:** Önder Ergönül; **References and Fundings:** Bahar Madran.

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