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The Effect of Working-based Individual Protective Behaviors (WIPB) on COVID-19 Mortality in North-West of Iran: A Case-Control Study

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Abstract

Background: Given the global emergency for COVID-19 infections, only Working-based Individual Protective Behaviors (WIPB) such as health behaviors are emphasized as the most important obstacle in spreading the disease. This study aimed to determine the effect of WIPB on COVID-19 mortality.

Materials and Methods: This case-control study was conducted on 3088 people (case=1955, control=1133) of the northwest of Iran, Ardabil. Data for infected society people as a case group was collected from medical records retrospectively, and for the control group (noninfected) was obtained from the comprehensive health care system. A designed questionnaire was used to identify WIPB in the Ardabil population during the COVID-19 epidemic. Chi-square test and multivariate logistic regression were used in STATA version 16.

Results: The results showed that most patients with COVID-19 in the control group belonged to the Unemployed/Housewives occupational group (27.6%), and the lowest was related to the police officers (2.2%) and transport workers (2.3%). There was a significant difference between groups in terms of sociodemographic factors (p<0.001). Inpatients had used masks, gloves, and disinfectants in the last 14 days by 66.2%, 35.3%, and 44.1%, respectively. There was a significant difference between case and control groups in terms of using a mask (p=0.004), contacting, traveling, and participating in public gatherings (p<0.001).

Conclusions: By increasing WIPBs and teaching how to properly observe such behaviors, including the proper use of masks, disinfectants, and gloves in society, as well as intensifying quarantine by preventing gatherings, the incidence and prevalence of COVID-19 can be reduced.

Keywords: SARS-CoV-2, Health Behaviors, Mortality.

Introduction

Recently, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) outbreak, with social, economic, and cultural effects, has been declared as a global health emergency by the World Health Organization (WHO) [1, 2]. The number of infected people and the worldwide mortality rate indicate the severity of this viral infection. The COVID-19 infection is a contagious disease with a mortality rate of 3.4%, estimated by the WHO as of March 3, 2020 [3, 4]. Until now (October 2021), COVID-19 has infected 245,007,726 and killed 4,973,772 persons worldwide. In Iran, 5,877,456 and 125,519 persons have been infected and died, respectively,

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due to the COVID-19 disease [5]. It should be mentioned that Iran is ranked 8th in the world in terms of coronavirus infection (https://www.worldometers.info/coronavirus/). The COVID-19 outbreak will be flat in the new year in Iran if public and social behavior initiatives stick with current patterns or improve [2, 6, 7].

Working-based Individual Protective Behaviours (WIPB) have a significant impact on the patterns of infectious disease transmission, including COVID-19, which threatens the current health system and social organization. They are protective behaviors enacted by people to protect themselves or others from a threat to their health [8, 9]. Until vaccination is fully implemented worldwide, effective social and individual prevention is the only option to neutralize COVID-19. The modeling and interpreting social action processes (e.g., use of mask and social distance), as well as their contextualization with respect to countries' cultural systems, can lead to a stronger national and local reaction to an epidemic [10]. In addition, a retrospective analysis provided evidence of WIPB's key role in preventive actions in the control of acute respiratory syndrome (SARS) in 2003 [11]. WHO Statistical Monitoring reports that prevention and control guidelines lead to a reduction in healthcare-related infections. Various preventive options can be considered as a potential intervention to combat COVID-19 [12]. According to WHO guidelines, infection prevention and control is a practical and evidence-based way to avoid harm to healthy people via preventable infections [13, 14]. Coronavirus-related infections may be transmitted through contact, droplets, and airborne [1, 15]. Given the global emergency for COVID-19 infections, only WIPB remains to limit its prevalence. WIPB is a personal protective behavior and a primary prevention method such as using gloves, masks, and disinfectants, as well as washing hands against Covid 19 disease. The transmission is minimized with proper prevention.

The main basis of preventing viral infection is the regular use of soap or sanitizer and personal protective equipment (appropriate mask, eye protection, face) [16]. Also, to control COVID-19 in different countries, especially Iran, various actions have been taken. Closing school, urging people to stay home, reducing the number of close physical interactions among people are some of such actions. Social distancing has simultaneously disrupted the everyday lives of the entire population wherever it has been implemented [17-19]. Such large and sudden disruptions to everyday life are likely to impact human well-being, particularly among people living in dense urban settings with limited public space. For example, elders, who are mainly at risk of suffering from lethal effects of COVID-19, are a risk group by also suffering from anxiety and depression sue to social isolation [20, 21]. All prevention actions utilized for the communicable COVID-19 disease cause loss of usual routine and reduce social and physical contact, which have frequently been reported to cause boredom, frustration, and a sense of isolation from the rest of the world, in turn resulting in distress, depression, stress, low mood, irritability, insomnia, and post-traumatic stress symptoms [22]. This frustration is exacerbated by not being able to take part in usual day-to-day activities, such as shopping for necessities [23], which is associated with harmful health outcomes [18]. In general, essential workers who provide crucial or fundamental public services, including healthcare, social care, sanitary services, and transportation, have continued attending work to carry out their daily duties. These critical worker groups have been exposed to the SARS-CoV-2 virus as a result, which may bring them into close contact with members of the public infected, especially since carriers may be infectious without, or before, exhibiting symptoms.

There are many unanswered questions about the COVID-19 epidemic, from the epidemic situation to the factors that reduce or eliminate the disease, especially regarding the impact of WIPB on the prevention and risk of COVID-19, in people's minds, particularly in high-risk locations where overcrowding is a major concern. Care in using the recommended precautions is especially important for all patients with respiratory diseases [27]. Even if they are not suspected of having COVID-19, they may be carriers; thus, regular use of these preventive and control measures in health behavior is recommended [14]. Therefore, in this study, we examine the effect of WIPB (using masks, disinfectants, gloves) on coronavirus disease (COVID-19) mortality in the northwest of Iran.

Materials and Methods

The present study is a case-control study performed on the data obtained from patients hospitalized due to coronavirus disease and the healthy population of Ardabil province, located in the northwest of Iran with a population of about 1.3 million and a gender composition of 58 % men and 48 % women. Fig 1 presents the map of the northwest of Iran. Data were acquired from a retrospective medical record recorded in the integrated information system of patients with COVID-19 in Ardabil province. The information of all infected patients with COVID-19 registered in the mentioned system was collected from March

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21 to September 20, 2020, in the form of a census, which included a total of 1955 files. The information in this study was related to the total coronavirus data (of admitted patients) in hospitals in all cities of Ardabil province. Exclusion criteria for the case group were incorrect or incomplete patient information in the system, patients with reasons for hospitalization other than Covid-19, and patients who stated, at the time of admission, that they did not want their data to be used. The data related to the control group were extracted from the information registered in the comprehensive health care system of the province (SIB system) based on the national code and the random sampling method. Exclusion criteria for the control group were patients with incomplete information in the SIB system, unavailability of the selected person, or people who were unwilling to collaborate on the study (who was replaced with a similar person from the same system). For the case group, 1133 healthy individuals without a history of COVID-19 were selected in the relevant period.

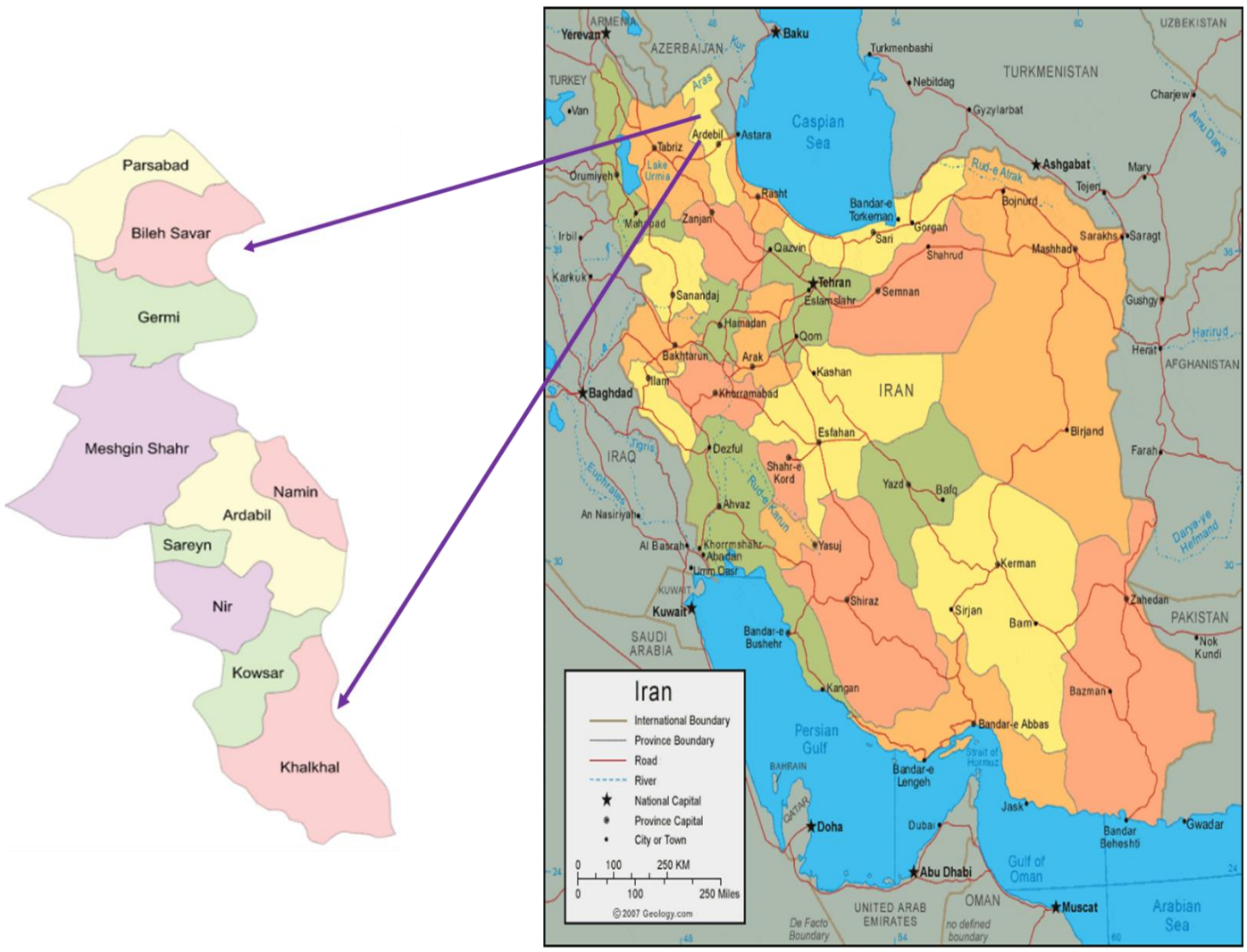


Fig. 1. Area of study (cities of Ardabil province located in northwestern Iran during the SARS-CoV-2 pandemic)

The data collection tool in the present study was a questionnaire to identify the health behaviors of patients and healthy individuals, being designed electronically and used as an information system. The validity of the tool was measured using the content validity method, and its value was equal to 0.84. In addition, in evaluating the reliability of this scale, Cronbach's alpha coefficient was obtained to be 0.79, indicating its good reliability. The dependent variable in the present study was considered to be mortality due to COVID-19. The WIPB of the case and control groups included four sections, i.e., contact and travel history, direct contact with customers or clients, observance of health protocols at work and home, and presence in different circles and places during 14 days. The incubation period for COVID-19 disease, which is the time between exposure to the virus (becoming infected) and symptom onset, is on average 5-6 days, but it can be up to 14 days [28, 29]. For this purpose, a period of 14 days was considered. Demographic variables, including age (<10 to >80 years), gender (male and female), place of residence (provincial capital or affiliated cities), underlying disease states (diabetes, obesity, as well as cardiovascular, lung, and metabolic

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diseases), smoking (Yes/No), body mass index (from underweight to overweight), and occupational groups (direct contact with customers, Yes/No) were considered and relevant information were collected for all participants. According to the job classification plan (approved by the Islamic consultative assembly in the second socio-economic development plan of Iran and then notified to the organizations by the government), jobs in Iran can be classified into one of the eight groups presented in Table 1 [30]. In this study, we divided participants into eight occupational groups, including unemployed or housewife, educational workers, official employees, medical staff, shopkeepers, farmers/ranchers, police officers, protective service workers, social service workers, and transport workers. Unemployed and housewives were categorized as separate groups.

Table 1. Jobs in Iran classified by governmental organizations

Row	Description
1	The field of educational, cultural, and artistic affairs (such as teachers and professors)
2	Administrative and financial field (such as bank officers and private insurances officers)
3	Field of social affairs (such as all fields of research in psychology, sociology, political science, etc.)
4	The field of health and treatment (including all professions of medicine, dentistry, paramedical, nursing, etc.)
5	Field of services (including all brokerage, shopkeepers, sales, mechanics, etc.)
6	The field of agriculture and environment (including farming and harvesting jobs, etc.)
7	Technical and engineering field (including all hardware and software jobs in industry and technology, etc.)
8	The field of data processing (including all occupations related to information, etc.)

Accurate t-test and Chi-square were used to evaluate and compare the case and control groups in terms of demographic and background variables. Also, Fisher tests were used to examine the relationship between two groups of unpaired data in the case of qualitative data availability. A Chi-square test with a significance level of 0.05 was considered to compare the two groups in terms of health behaviors. Multivariate logistic regression was used to investigate the relationship between independent and contextual background with COVID-19 mortality in inpatients.

Results

The frequency of people involved in coronavirus disease in the whole society in Ardabil province is shown in Fig 2. According to the figure, the highest and lowest society infected with coronavirus in the province were related to Ardabil and Kowsar cities, respectively. Also, the percentage of coronavirus infection, mortality, and recovery of people hospitalized were equal to 1.63%, 0.09%, and 1.51%, respectively.

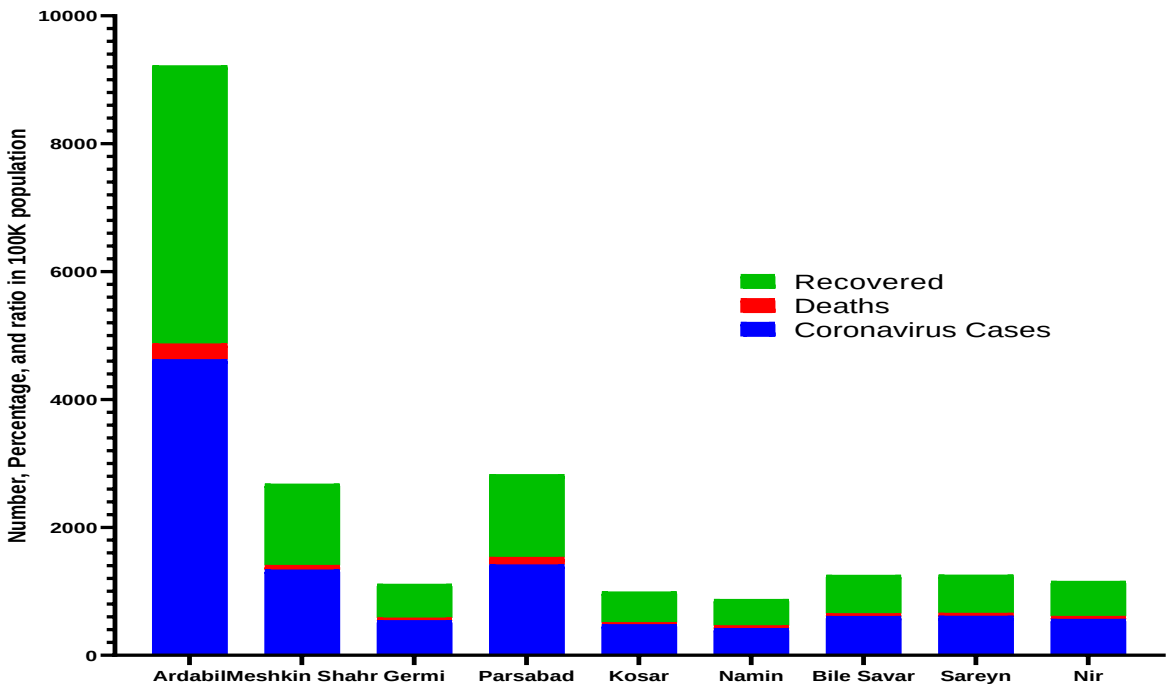


Fig. 2. The frequency distribution of whole people in Ardabil province involved in coronavirus disease

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In total, 3088 participants (1955 case and 1133 control) completed the questionnaires. Table 2 shows the sociodemographic characteristics of the study participants. The majority of the participants for the case samples had the following features: being over the age of 40 years (81.8%), female (53.6%), from subordinate cities (74.6%), having cardiovascular diseases; (32.84%), being non-smokers (95.7%), official employees (17.7%) and overweight (65.7%). According to the results, the highest occupational groups at risk of Covid-19 disease were housewives (27.6%), official employees (18.4%), social service workers (15.9%), shopkeepers (11.6%), medical staff (8.3%), educational workers (7.2%), farmer/rancher (6.5%), transport workers (2.3%), and police officers (2.2%), respectively. Also, there was a statistically significant difference between case and control groups in terms of all studied parameters (except the place of residence and occupation), including age, sex, Non-Communicable Diseases (NCDs), smoking, and Body Mass Index (BMI) ($p<0.001$).

Table 2. Sociodemographic characteristics of study participants (n=3088)

		Case (n=1955)		Control (n=1133)		Total	
		Frequency	**Percent**	**Frequency**	**Percent**	**Chi²**	**P-value**
Age categories	<10	42	2.1	3	0.3	547.03	<0.001
	10-19	17	0.9	35	3.1		
	20-29	84	4.3	122	10.8		
	30-39	213	10.9	269	23.7		
	40-49	261	13.4	325	28.7		
	50-59	321	16.4	209	18.4		
	60-69	403	20.6	127	11.2		
	70-79	350	17.9	36	3.2		
	>80	264	13.5	7	0.6		
Sex	Male	908	46.4	616	54.4	18.01	<0.001
	Female	1047	53.6	517	45.6		
Occupation groups	Unemployed/ Housewives	540	27.6	287	25.3	21.05	0.105
	Educational workers	141	7.2	78	6.9		
	Official employee	360	18.4	220	19.4		
	Medical staff	162	8.3	114	10.1		
	Shopkeepers	227	11.6	162	14.3		
	Farmer / rancher	127	6.5	52	4.6		
	Police officers	43	2.2	20	1.8		
	Social service workers	311	15.9	169	14.9		
	Transport workers	45	2.3	31	2.7		
Residence	The capital of the province	497	25.4	377	33.3	7.567	0.214
	Subordinate cities	1458	74.6	756	66.7		
NCDs	Diabetes	406	20.77	106	9.36	96.2	<0.001
	CVDs	642	32.84	72	6.35	283.3	<0.001
	Obese	412	21.07	60	5.30	137.9	<0.001
	Metabolic disease	90	4.60	4	0.35	43.9	<0.001
	Lung disease	140	7.2	53	4.7	7.54	0.006
Smoking	Yes	84	4.3	115	10.2	40.76	<0.001
	No	1871	95.7	1018	89.8		
BMI categories	Underweight	52	2.7	34	3.0	141.7	<0.001
	Normal weight	340	17.4	300	26.5		
	Overweight	1285	65.7	501	44.2		
	obesity	278	14.2	297	26.2		

Note: n= Number, NCDs= Non-Communicable Diseases, CVDs= Cardiovascular Diseases, BMI= Body Mass Index

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The results related to health behaviors and protocols in hospitalized patients with COVID-19 and healthy individuals are presented in Table 3. According to the table, 61.5% of hospitalized patients with COVID-19 in the last 14 days had contact with an unknown resource. Of the 1955 hospitalized patients with COVID-19 in the last 14 days, 66.2%, 35.3%, and 44.1% used masks, gloves, and disinfectants, respectively. While in the control group, 66.2% of the masks, 36.5% of the gloves, and 47.1% of the disinfectants were used in the last 14 days. Moreover, 49.56% of hospitalized patients with Covid-19 had daily direct contact with customers or clients, while just 31.51% of the control group had daily direct contact with customers or clients. According to the results, 24.9% of the hospitalized patients with Covid-19 went to universities, 21.8% to public gatherings, and 10.1% to hospitals during the Covid-19 pandemic period, thus probably being infected with Covid 19 disease there.

Table 3. Working-Based Individual Protective Behaviours (WIPB) in hospitalized patients with COVID-19 and healthy people (n=3088)

		Case (n=1955)		Control (n=1133)		Total	
		n	%	n	%	chi^2	P-value
Contact with/traveling	Traveling out of place of residence	328	16.8	63	5.3	84.03	<0.001
	Contact with patient before illness	261	13.8	103	9.1	45.04	<0.001
	Traveling to polluted state	125	6.4	33	2.9	75.49	<0.001
	Contact with medical person	32	1.6	2	0.2	14.04	<0.001
	Contact with patient	158	8.1	2	0.2	91.24	<0.001
	Contact with unknown resource	1202	61.5	1	0.1	1136.9	<0.001
Used …. in Last 14 Days	Mask	1193	62.9	750	66.2	8.22	0.004
	Gloves	690	35.3	413	36.5	0.419	0.518
	Disinfectant	862	44.1	534	47.1	2.67	0.102
Direct contact with costomers or clients	Yes	986	49.56	354	31.51	13.26	0.003
	No	969	50.43	776	68.49		
Go to …. during COVID-19 pandemic	Clinic	114	5.8	82	7.2	2.38	0.122
	Hospital	197	10.1	79	7.0	8.49	0.004
	Health center	66	3.4	94	8.3	35.35	<0.001
	University	349	24.9	26	2.3	71.48	<0.001
	Work place	57	4.1	579	51.2	94.19	<0.001
	Public gathering	305	21.8	175	15.5	34.07	<0.001

The results related to the multivariable logistic regression model predicting death by population characteristic in inpatients are presented in Table 4. According to the table, in terms of age group, people over 50 years are most likely to die with COVID-19 disease. Further, the odds of death by COVID-19 in people over 80 years old is about 60 times and in people aged 70-80 years is about 48 times higher than those under 10 years old (p<0.001). The study results show that the odds of death due to Covid-19 in patients with direct contact with customers or clients based on their occupational status are about 3 times more than those without (p<0.001). Also, in terms of using protective equipment such as masks, gloves, and disinfectants, the percentage of people in the case and control groups is high. However, they may develop Covid 19 disease due to improper use of protective equipment. Also, people living in subordinate cities are about 6 times more likely to die by COVID-19 than those living in the capital of the province. In addition, according to the results, the odds ratio of death with COVID-19 in smokers is 1.73 times higher than in non-smokers (p<0.001). The odds of death by COVID-19 increase by increasing BMI; obese people die 1.63 times more than normal-weight people. Furthermore, old age (59.59, 95% CI, 5.76 to 615.7), living in subordinate cities (6.01, 95% CI, 4.47 to 8.07), having chronic diseases (4.60, 95% CI, 3.14 to 6.72), and high BMI (1.63, 95% CI, 1.14 to 2.35) significantly increase odds of death by COVID-19 in infected patients (Table 4).

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Table 4. Multivariable logistic regression model predicting death by population characteristic in inpatients (n=1955)

		Odd ratio	[95% Conf. Interval]	P-value
Age categories	<10	1.00 (referent)	-	-
	10-19	3.31	0.16 to 66.67	0.434
	20-29	2.60	0.12 to 55.00	0.538
	30-39	7.64	0.68 to 84.64	0.097
	40-49	11.07	1.04 to 117.6	0.046
	50-59	23.21	2.24 to 240.5	0.008
	60-69	27.95	2.75 to 283.3	0.005
	70-79	47.27	4.58 to 487.5	<0.001
	>80	59.59	5.76 to 615.7	<0.001
Sex	Male	1.00 (referent)	-	-
	Female	1.25	0.93 to 1.68	0.133
Direct contact with customers or clients	No	1.00 (referent)	-	-
	Yes	3.05	1.40 to 8.38	<0.001
Residence	The capital of the province	1.00 (referent)	-	-
	Subordinate cities	6.01	4.47 to 8.07	<0.001
NCDs	Chronic dis.	4.60	3.14 to 6.72	<0.001
	Diabetes	2.50	1.95 to 3.21	<0.001
	CVDs	3.73	2.93 to 4.76	<0.001
	Obese	3.25	2.52 to 4.19	<0.001
	Metabolic disease	1.49	0.90 to 2.47	0.116
	Lung disease	2.48	1.70 to 3.61	<0.001
Smoking	Yes	1.73	0.94 to 3.18	0.075
	No	1.00 (referent)	-	-
BMI categorized	Underweight	0.55	0.24 to 1.29	0.173
	Normal weight	1.00 (referent)	-	-
	Overweight	1.85	1.36 to 2.56	<0.001
	obesity	1.63	1.14 to 2.35	0.007

CI = Confidence Interval; n= Number, NCDs= Non-Communicable Diseases, CVDs= Cardiovascular Diseases, BMI= Body Mass Index

Using personal protective equipment (Masks, gloves, and disinfectants) against COVID-19 between inpatients is shown in Fig 3. Based on the results, there were significant differences between alive and dead patients by COVID-19 in terms of using personal protective equipment (p<0.001).

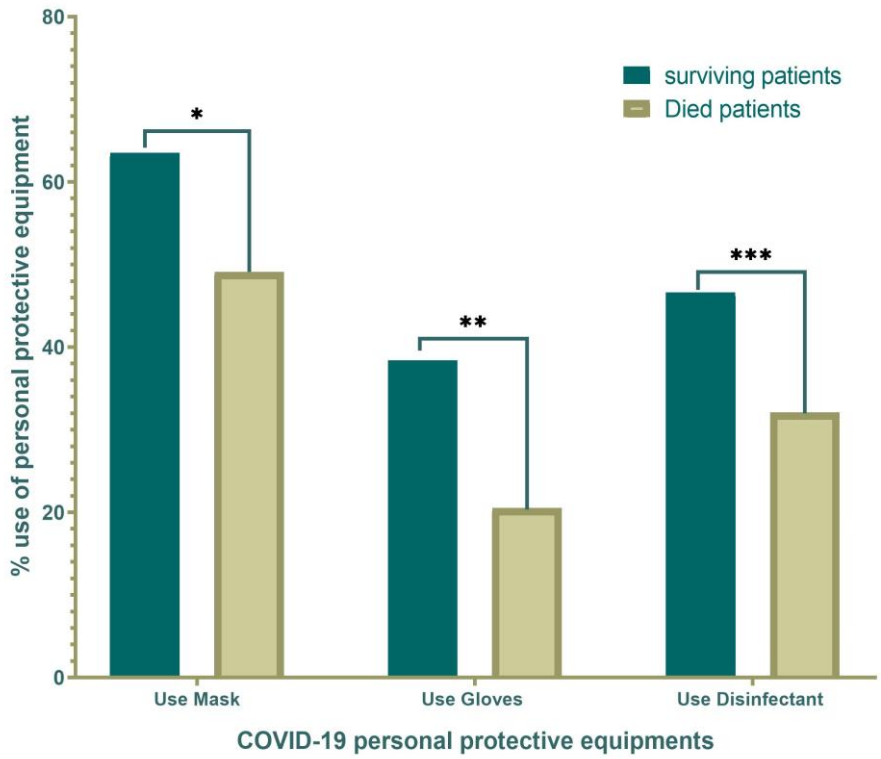


Fig. 3. Comparison of patients who died due to Covid-19 with those who survived in terms of using personal protective equipment, where there was a significant difference between the two groups in terms of *=using masks (□2=30.26, p<0.001), **=using gloves (□2=36.81, p<0.001), and ***=using disinfectant (□2=25.26, p<0.001).

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Discussion

The study of Working-Based Individual Protective Behaviours (WIPB) is important in dealing with the pandemic of infectious diseases, especially in countries like Iran that are at a moderate level in terms of social behaviors [10]. The individuals' adherence to these WIPBs can be developed by providing masks, gloves, and disinfectants, as well as overwhelming the environmental barriers [31, 32]. The PPE includes gowns, goggles, gloves, face shields, and other items used by frontline health care and other essential workers. The proper use of quality-assured PPE is crucial to prevent exposure to infectious diseases, including COVID-19. This is essential to limit the acquisition and transmission of the virus to protect both health professionals and patients. Protecting health professionals not only limits disease spread, but also ensures the availability of adequate numbers of staff to cope with the inevitable increasing demands for healthcare services in the coming weeks and months ahead [33-35]. The use of personal protective equipment (PPE), especially medical masks, has become commonplace for people around the world. The present study showed that the level of adherence to WIPBs (such as the use of masks, gloves, and disinfectants) in people with COVID-19 was at a desirable level. According to the results, although the observance of hygienic behaviors such as using masks, gloves, and disinfectants in the case and control groups in the last 14 days was almost the same, many people were hospitalized for the COVID-19 virus. This was due to various reasons as follows: I) improper use of masks, gloves, and disinfectants, II) the possibility of people being present in places where a person has had COVID-19, III) the possibility of contact of gloves infected with COVID-19 virus with eyes, nose, and mouth, IV) the use of disinfectants containing a low percentage of alcohol and other disinfectants, V) the use of simple household masks with the possibility of virus penetration into it, VI) the possibility of the presence of people with masks for a long time without ventilation in places where the person has had Covid-19, VII) wrong time of mask replacement, and VIII) non-observance of social distance (at least 2m) [34, 36-41]. Social distancing prevents direct contact between people and reduces the possible transmission of virus-carrying droplets from human respiration [42]. In addition, compared to regular soaps, hand sanitizing soaps reduce the number of germs for a short period. Moreover, alcohol disinfectant limits viral growth by depositing surface proteins that break the coronavirus transmission chain [43].

In a study conducted by Sun et al. (2020) to evaluate the efficacy of social distance and ventilation in preventing COVID-19 transmission, it was detected that the increased observance of social distance by people could decrease the probability of transmission of COVID-19 disease [42].

In the study of Khazaee et al. (2020), 54.3% of the subjects often used gloves and masks, and about 80% of the subjects used disinfectants [44, 45], which was consistent with the present study. According to the results, the probability of contacting or traveling among the people with COVID-19 was greater than the control people. In some occupations, such as taxi drivers, it can be difficult to follow health measures such as social distance. Therefore, it is very important to study the disease in such occupations [46, 47]. The results showed that in terms of jobs distribution, 540 (27.6%) of people with Covid-19 disease were housewives, with the highest number in the present study. Also, the lowest number of patients were related to police officers (2.2%) and transport workers (2.3%), which was consistent with the study [48]. In the study of Sarailoo et al., the highest number of patients with Covid-19 disease was related to housewives. According to research, the presence of underlying diseases such as hypertension, diabetes, cardiovascular disease, chronic liver and kidney disease, cerebrovascular disease, chronic lung failure, malignancies, autoimmune diseases in the elderly (> 60 years) with COVID-19 disease was greater compared to other age groups [49]. According to the results, the highest incidence of underlying diseases in people with COVID-19 was related to Cardiovascular Diseases (CVDs) (32.84%). Moreover, the odds ratio of infecting with COVID-19 among the individuals in the age range of 50-59, 60-69, and 70-79 years, as well as the age over 80 years, were 23.21, 27.95, 42.27, and 60 times more than those in the age range of 10 years as a reference group, respectively. Various studies on the elderly with COVID-19 have shown that most of the elderly (60.7%) have an underlying disease, and about one-third of them have two or more than two underlying diseases simultaneously [50]. Another study has shown that the fatality rate of COVID-19 disease in people over 60 years with underlying disease (4.5%) is higher than those under 60 years (1.4%) [51]. This could be due to the following reasons: the coronavirus located in the lungs, a change in the physical characteristics of the lung tissue, or the aging of the immune system. Normally, the lungs produce an immune response by coughing, producing mucus, and clearing the airways. These responses play an important role in

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repelling the virus out of the airways and reducing the incidence of the disease. Such responses decrease with age in the body, thus increasing the risk of developing COVID-19 in the elderly [52]. Also, the report of the Center for Disease Control and Prevention indicates that the rate of hospitalization, admission to the intensive care unit, and death due to COVID-19 at the age of over 65 years is higher than other age groups [53]; this is consistent with the present study. Moreover, according to the results, in terms of gender, the percentage of women hospitalized with COVID-19 (53.6%) is much higher than men (46.4%), which is consistent with the study conducted by Costa et al. (2020) [54]. In a study, Pourfarzi et al. have investigated the cause of high coronary mortality among women in Iran and Ardabil. They show that non-observance of health protocols such as wearing masks, using disinfectants, and non-observing social distance cause high mortality and morbidity of Ardabil women [55].

The present study had some limitations, including the lack of possibility of examining the observance of social distance as one of the main health protocols. Also, in this study, the type of mask and disinfectant used by the subjects were not investigated.

Conclusion

This study showed that more than 60 % of inpatients followed health protocols but were infected, possibly due to a lack of knowledge about the use of masks, gloves, and disinfectants or incomplete adherence to protocols. Older people living in subordinate cities with non-communicable diseases such as diabetes, CVDs, and obesity were identified as contributing factors to the increased mortality rate of COVID-19. Improving the observance of health protocols, including the proper use of masks, disinfectants, and gloves, as well as intensifying quarantine, can reduce the incidence and prevalence of COVID-19 disease. Given the importance of prevention, especially until the discovery and widespread use of the vaccine, it is still necessary to emphasize compliance with WIPB and protocols to prevent the spread of COVID-19.

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