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The Intention of Changing Adherence to COVID-19 Preventive Health Measures After Implementation of COVID-19 Vaccination Program: An Online-Based Study in Mazandaran Province, Iran

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Abstract

Background: The nature and extent of changing adherence to COVID-19 preventive health measures are different in various populations.
Objectives: The aim of this study was to investigate the intention of changing adherence to COVID-19 preventive health measures (ICA-COVID-19–PHM) after implementation of the COVID-19 vaccination program compared to when they had not received the vaccine.
Methods: This cross-sectional study was conducted on 1000 participants in the 18 to 60-year-old group population (Mazandaran Province, Iran). The data were collected by an anonymous online "Google Form" questionnaire. The Pearson correlation coefficient, intra-class correlation coefficient (ICC), and paired *t*-test were used to evaluate the intention of changing adherence to COVID-19 preventive measures.
Results: The correlation coefficient ranged from 0.58 for non-travel to 0.76 for personal hygiene. ICC ranged from 0.68 for non-traveling to 0.86 for personal hygiene and hand/face washing. The results of the paired *t*-test showed that there was a significant difference between the adherence at the present time and the intention to adhere to preventive protocols after receiving the vaccine.
Conclusions: The intention of changing adherence to preventive health measures, such as avoiding travel and crowded places and mask-wearing, had the most reduction.

Keywords: Intention, Adherence, Preventive Health Measures, Mask-Wearing, Personal Hygiene

1. Background

Following the announcement of COVID-19 as an international concern by the World Health Organization (WHO) (1, 2), personal and social preventive measures were requested, including hand and face washing, wearing a mask, social distancing, and non-participation in meetings, as the most important ways to minimize virus transmission (3-7). Gradually, several months after the pandemic began, there were reports of the development and injection of the COVID-19 vaccine in various countries. According to previous studies, adherence to preventive measures has been reduced after receiving the vaccine in the general population or due to epidemic fatigue (8-12). However, the nature and extent of this change and reduction in adherence to preventive measures have been different in various populations. The current study was performed due to the importance of these data for health policymakers and regional managers (for both the current pandemic and potential future pandemics) and the lack of a study in the Iranian sociocultural context.

2. Objectives

The aim of this study was to investigate the intention of changing adherence to COVID-19 preventive health measures (ICA-COVID-19–PHM) after implementation of the COVID-19 vaccination program compared to when they had not received the vaccine. This study was performed at a time only medical staff had been vaccinated in Iran, and general population vaccination had not yet begun.

3. Methods

3.1. Participations

The study participations were the general population of Mazandaran Province, the age groups of 18 to 60 years old who are active in using virtual or social networks such as WhatsApp, ETA, Yes, Rubika, and Instagram. The sample size of the present study was 1000 participants [it was determined using the single population proportion formula with assumptions of 4% margin of error, 95% CI, 40% expected proportion of adherence, 1.5 for design effect (for cities), and 10% non-response rate], which was considered with a distribution almost proportional to the population of the cities of Mazandaran Province.

3.2. Data Collection

Data were collected using a researcher-made questionnaire (2 subscales: 10 questions for each scale). The questionnaire was developed by expert opinion (2 epidemiologists, 2 community medicine specialists, 1 public health specialist, 1 infectious diseases specialist, 1 health education specialist, and 1 health information management specialist). Its construct validity was evaluated by Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), and its reliability was evaluated by Cronbach's alpha for internal consistency. Questions were asked about participants' performance in adhering to preventive measures for COVID-19 under the current conditions (when they did not yet receive the vaccine) with Cronbach's alpha of 0.89 and their intention to adhere to the preventive measures for COVID-19 after implementation of a COVID-19 vaccination program with Cronbach's alpha of 0.92. The response options in the questionnaire were defined in a range of 1 (weakest compliance) to 5 (strongest compliance). In addition, socio-demographic characteristics such as sex/occupation/education were collected.

3.3. Statistical Analysis

The frequency and percentage of socio-demographic characteristics were computed. The Pearson correlation coefficient, intra-class correlation coefficient (ICC), and paired *t*-test were used to evaluate the intention of changing adherence to COVID-19 preventive health measures (ICA-COVID-19-PHM). An analysis was performed in Stata version 16. In all statistical tests, the significance level was considered 0.05.

4. Results

The demographic distribution of participants is shown in Table 1. Table 2 shows the significant relationship between current protocol compliance and intention to adhere to post-vaccination for each protocol and total. The correlation coefficient ranged from 0.58 for non-travel to 0.76 for personal hygiene. ICC ranged from 0.68 for non-traveling to 0.86 for personal hygiene and hand/face washing. The results of the paired *t*-test showed that there was a significant difference between the adherence at the present time and the intention to adhere to preventive protocols after receiving the vaccine.

Table 1. Demographic Characteristics of the Study Participants

Demographic Variables	No. (%)
Gender	
Female	674 (67.4)
Male	326 (32.6)
Marital status	
Single	371 (37.1)
Married	600 (60)
Divorce	22 (2.2)
Widow	7 (0.7)
Education level	
Under diploma	77 (7.7)
Diploma	265 (26.5)
Master diploma	70 (7)
BS	355 (35.5)
MSc	156 (15.6)
Doctor	77 (7.7)
Income	
Not enough	497 (49.7)
Enough but without savings	388 (38.8)
Enough and have savings	115 (11.5)
Job	
Health workers	251 (25.1)
Military	8 (0.8)
Students	216 (21.6)
Housewives	180 (18)
Other organizations	111 (11.1)
Other occupations	234 (23.4)

5. Discussion

The results of the present study showed that the intention of changing adherence to all COVID-19 preventive health measures (ICA-COVID-19-PHM) was reduced after vaccination of COVID-19 (except for using gloves); this the difference was not large, but it was statistically significant. This low reduction of preventive measures seems to be due

Table 2. Pearson Correlation, Intra-Class Correlation, Mean and SD, and Paired *t*-Test Statistics for Various Preventive Measures of COVID-19 [a]

Preventive Measures	Pearson Correlation	Intra-Class Correlation [b]	Adherence (Pre-Vaccination)	Adherence (After Vaccination)	Difference	Paired *t*-Test Statistics	Reduction (%)
Keeping a safe distance of at least 6 feet (approximately 2 meters)	0.71 [c]	0.82	3.66 ± 1.14	3.50 ± 1.22	0.15 ± 0.91	5.34 [c]	4.19
Avoiding leaving home, except to go to essential work	0.59 [c]	0.72	3.52 ± 1.30	3.22 ± 1.31	0.30 ± 1.18	7.98 [c]	8.47
Personal hygiene	0.76 [c]	0.86	4.24 ± 0.96	4.16 ± 1.01	0.08 ± 0.69	3.47 [c]	1.79
Hand and face washing	0.75 [c]	0.86	4.18 ± 0.97	4.09 ± 1.03	0.09 ± 0.70	4.17 [c]	2.22
Wearing a mask	0.64 [c]	0.75	4.22 ± 1.04	3.88 ± 1.21	0.34 ± 0.96	11.27 [c]	8.14
Use of gloves	0.73 [c]	0.84	2.15 ± 1.28	2.22 ± 1.39	-0.06 ± 0.98	-2.03 [d]	-2.93
Isolating myself at home when sick	0.65 [c]	0.78	4.32 ± 0.99	4.17 ± 1.06	0.15 ± 0.87	5.50 [c]	3.49
Avoiding any non-essential travel (domestic, international)	0.58 [c]	0.68	4.08 ± 1.16	3.59 ± 1.30	0.49 ± 1.14	13.56 [c]	11.96
Disinfection of hands	0.72 [c]	0.83	3.83 ± 1.24	3.57 ± 1.30	0.26 ± 0.95	8.51 [c]	6.66
Avoiding crowded places (concerts, conferences, arenas, festivals)	0.62 [c]	0.74	3.58 ± 1.23	3.26 ± 1.31	0.32 ± 1.12	9.12 [c]	8.99
Total	0.76	0.84	37.78 ± 8.19	35.67 ± 9.10	2.12 ± 6.07	11.03 [c]	5.60

[a] Values are expressed as mean ± SD.
[b] ICC below 0.50: Poor; Between 0.50 and 0.75: Moderate; Between 0.75 and 0.90: Good; Above 0.90: Excellent.
[c] $P < 0.001$.
[d] $P < 0.05$.

to the pandemic fatigue or COVID-19 vaccination, which needs further investigation. This is because the ICC values of each preventive health measure and also total preventive measure showed moderate to good consistency. Also, the Pearson correlation between preventive health measures before vaccination and the intention to adhere after vaccination was strong. It seems that regarding the nature of COVID-19 and also the high probability of genetic mutations, the vaccination will be considered a repetitive action, and adhering to health protocols is a complementary strategy for this disease until the complete disruption of the pandemic chain.

5.1. Limitations

Although the large sample size and inclusion of all cities of Mazandaran Province are the strengths of this study, there are several limitations. First, the generalizability of the results to other provinces of Iran should be done with caution. Second, participants of this study are not a good representation of the general population. Third, the preventive measures of the government were not considered.

5.2. Conclusions

Considering the limitation mentioned above, it can be concluded that the intention of changing adherence to COVID-19 preventive health measures of the people of Mazandaran Province after implementation of a COVID-19 vaccination program compared to when they did not receive the vaccine is decreasing. The intention of changing adherence to preventive health measures (such as avoiding travel and crowded places and mask-wearing) had the most reduction. In addition, the results of the

present study may implicitly reflect health literacy and post-vaccination concerns about the disease at regional and provincial levels.

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Footnotes

Authors' Contribution: Study concept and design, M. R. and SH. A.; Analysis and interpretation of data, M. R.; Drafting of the manuscript, SZ. PG., P. K., and M. S.; Critical revision of the manuscript for important intellectual content, M. R., SH. A., and S. B.; Statistical analysis, M. R.

Conflict of Interests: Dr Meisam Rezapour and Dr Shahabeddin Abhari are assistant professors at Mazandaran University of Medical Sciences. Dr Shahabeddin Abhari is a reviewer in some other papers in this journal.

Data Reproducibility: It was not declared by the authors.

Ethical Approval: The Ethics Committee of Mazandaran University of Medical Sciences approved this study (code: IR.MAZUMS.REC.1400.069) (ethics.research.ac.ir/EthicsProposalView.php?id=191006).

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