



COVID-19 Among Elite Soccer Players: Lessons Learned from Effectiveness of Health Protocols

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Abstract

Background: The COVID-19 pandemic shocked the globe unexpectedly, and the elite player community was no exception. The only weapon world had to defeat it was health protocols besides vaccines. However, were these protocols effective among professional soccer players? Are they useful for a further possible pandemic?

Objectives: This study assessed how adhering to health protocol affects the player's COVID-19 serology tests (IgG and IgM), polymerase chain reaction (PCR) results, and symptoms.

Methods: This study was performed on 321 professional football players from Iran Premier League during pre-season examinations. Players adhering to health protocols and COVID-19 symptoms were assessed through a questionnaire in the last 14 days and 6 months. Participants' PCR tests and anti-SARS-CoV-2 antibodies (IgG and IgM) were recorded. A P-value of less than 0.05 was regarded as significant.

Results: Logistic regression results showed that PCR tests are 6.60 times more likely to be positive for players who often wore masks outside the camp than those who have always worn masks. On the other hand, for those who always wore a mask inside team camp, the chance of a positive IgG test was 0.17 compared to players who had never done that in the last 14 days.

Conclusions: Our findings suggest that in a pandemic, like COVID-19, despite negative PCR serology or having any symptoms, encouraging our professional athletes to wear masks and physical distancing of 6 feet outside the camp and at least doing these health protocols inside the team camp between training might be helpful. Other health protocols like hand hygiene might be recommended to elite football players like ordinary people. However, there is no need for extra emphasis, especially inside the team camp.

Keywords: COVID-19, Athletes, Health, Clinical Protocols, Polymerase Chain Reaction, Serology, Signs and Symptoms

1. Background

In late 2019, with the coronavirus disease 2019 (COVID-19) release in Wuhan, China, no one thought that the virus would someday spread worldwide and disrupt the activities of regular and professional life (1). The world health organization (WHO) announced the emergence of a pandemic that threatens global health (2). The coronavirus involves the respiratory system and other organs of the body. It shows various symptoms, such as fever, shortness of breath, cough, gastrointestinal problems, muscle weakness and pain, and skin rash (3, 4). The widespread transmission of this virus is reportedly due to human-to-human transmission, primarily through

respiratory droplets (5). With the rapid increase in the prevalence of coronavirus, various methods have been taken to prevent, treat, and develop vaccines in most communities (6). Therefore, several prevention protocols were considered, including full quarantine (4), social distance policy, masking, frequent hand washing, no gatherings and travels, and evacuation of public places (5, 7).

The outbreak of COVID-19 engaged professional sports in a complicated situation (3). According to studies, COVID-19 infection in athletes causes at least two weeks away from sports and training fields. In addition, it can lead to respiratory or cardiac complications or, in some cases, even cytokine storm and death (5, 8). Prevention

protocols can also negatively affect athletes' physical, nutritional, and mental performance (9). Thus, it was decided to close sports facilities as one of the gathering places in most countries (3). As the outbreak continued, the economic pressure on clubs increased; hence, sports federations decided to continue professional events under prevention protocols (10).

Nowadays, several studies are being done on the spread of coronavirus and ways to prevent it by considering sports competitions and, at the same time, keeping athletes safe. A study recommended that sports competitions be held under the supervision of the WHO and governments under health protocols for prevention (10). Another study also noted the importance of the responsibility of sports medicine professionals to recognize COVID-19 symptoms, perform prevention protocols, prompt diagnosis of patients, quarantine, and treat them appropriately (3).

Therefore, we designed this study to evaluate the success of adhering to health protocols in controlling the prevalence of the virus among Iranian elite football players. We evaluated what we learned from controlling the COVID-19 pandemic in elite soccer players with health protocols, a financially and psychologically important group.

2. Objectives

We aimed to find more efficient health protocols for controlling a new possible pandemic in elite football players.

3. Methods

This study was conducted during pre-season examinations in Iran Football Medical Assessment and Research Center (IFMARC) as a retrospective cohort among professional football players in Iran from March to November 2020.

This research included 321 professional football players from the Premier League. The players who did not participate regularly in polymerase chain reaction (PCR) tests were excluded from the study. The ethical approval (IR.IUMS.FMD.REC.1400.162) was obtained from the Iran University of Medical Sciences ethics committee.

Researchers designed a checklist to obtain information on adherence to health protocols and filled out by the researcher personally for all the participants. It evaluated the extent of mask-wearing, social distancing of 6 feet inside and outside the camp, hand washing for 20 seconds at least five times a day, participating in parties, going on leisure trips, going to restaurants or cafes, shopping, and going to the gym outside the camp in the

intervals of last 14 days and last 6 months. Furthermore, COVID-19 symptoms were examined in these intervals. They include fever, cough, myalgia, runny nose, sore throat, shortness of breath, gastrointestinal symptoms, and loss of sense of smell and taste.

The players' COVID-19 PCR results were obtained from the league organization. These tests were done on players based on their request at the initial lockdown and by clubs every two weeks from the start of training till the end of the season. PCR pharyngeal swab test was performed with kits approved by the Ministry of Health of Iran by experienced clinicians. The results included negative (cycle threshold (CT) values > 40), positive (CT < 40), and undetermined. The diagnosis of COVID-19 in this study was based on a positive PCR test.

Premier League serology tests have also been taken during pre-season examinations. All anti-SARS-CoV-2 antibodies (IgG and IgM) were assessed in a single lab by enzyme-linked immunosorbent assay (ELISA). A cut-off ratio ≥ 1 is considered positive, and a cut-off ratio < 1 is negative.

All statistical analyses were performed by SPSS 26. Adjusted odds ratio (OR) with a 95 % confidence interval (CI) was calculated, and the significance level was considered to be 5%. The effect of health protocols on positive tests was analyzed using logistic regression. A P-value of less than 0.05 was regarded as significant.

4. Results

The examined football players had a mean age of 26.3 ± 26.4 years, all under 40. The relationship between adhering to health protocols in the last 14 days and 6 months with all anti-SARS-CoV-2 antibodies (IgG and IgM), COVID-19 PCR, and having at least one coronavirus symptom were examined. According to the examination, 52 cases (10.4%) had a positive COVID-19 PCR test, and 51 cases (10.2%) and seven cases (1.4%) were positive for anti-SARS-CoV-2 IgG and IgM, respectively. Further, no one had a positive test more than once, and the hospitalization and mortality rate was 0%.

Logistic regression results showed that at a 95% confidence level, in the last 14 days, wearing a mask inside and outside the team camp, keeping a distance inside the team camp, and hand hygiene had a statistically significant relationship with the positive COVID-19 IgG test results. In the last 6 months' evaluation, besides mask-wearing and physical distancing, traveling and going to parties also had a relationship with the positive IgG test results (P-value < .05) (Table 1).

As shown in Table 1, for players who always wore a mask inside team camp, the chance of a positive IgG test was 0.17 and 0.13 times compared to players who had never done that, respectively, in the short (14 days) and long (6

Table 1. The Relationship Between Adhering to Health Protocols in the Last 14 Days and the Last 6 Months with Anti-SARS-CoV-2 Antibodies (IgG)

Adhering to Health Protocols	14 Days				6 Months			
	IgG, No. (%)							
	Negative	Positive	P-Value	OR (95% CI)	Negative	Positive	P-Value	OR (95% CI)
Wearing a mask inside the team camp								
Always	95 (33.2)	7 (22.6)	0.009	0.17 (0.04, 0.64)	92 (32.2)	6 (19.4)	0.003	0.13 (0.03, 0.50)
Often	88 (30.8)	5 (16.1)	0.005	0.13 (0.03, 0.54)	72 (25.2)	3 (9.7)	0.002	0.08 (0.01, 0.40)
Sometimes	55 (19.2)	5 (16.1)	0.032	0.21 (0.05, 0.87)	66 (23.1)	5 (16.1)	0.009	0.15 (0.03, 0.61)
Rarely	36 (12.6)	9 (29.0)	0.132	0.60 (0.16, 2.14)	46 (16.1)	12 (38.7)	0.307	0.52 (0.15, 1.81)
Never	12 (4.2)	5 (16.1)		1.00	10 (3.5)	5 (16.1)		1.00
Wearing a mask outside the team camp								
Always	173 (60.5)	6 (19.4)		1.00	167 (58.4)	7 (22.6)		1.00
Often	83 (29.0)	18 (58.1)	<0.0001	6.25 (2.39, 16.33)	75 (26.2)	12 (38.7)	0.007	3.81 (1.44, 10.08)
Sometimes	17 (5.9)	6 (19.4)	<0.001	10.17 (2.95, 35.03)	25 (8.7)	10 (32.3)	<0.001	9.54 (3.32, 27.36)
Rarely	8 (2.8)	1 (3.2)	0.260	3.60 (0.38, 33.60)	15 (5.2)	2 (6.5)	0.171	3.18 (0.60, 16.69)
Never	5 (1.7)	0 (0.0)	1.00	-	4 (1.4)	0 (0.0)	1.00	-
Keeping the distance inside the team camp								
Always	72 (25.2)	4 (12.9)	0.006	0.17 (0.04, 0.60)	66 (23.1)	3 (9.7)	0.005	0.12 (0.02, 0.53)
Often	40 (14.0)	3 (9.7)	0.041	0.23 (0.05, 0.94)	47 (16.4)	2 (6.5)	0.012	0.11 (0.02, 0.62)
Sometimes	84 (29.4)	5 (16.1)	0.005	0.18 (0.05, 0.59)	108 (37.8)	6 (19.4)	0.003	0.14 (0.04, 0.51)
Rarely	62 (21.7)	10 (32.3)	0.179	0.50 (0.18, 1.37)	49 (17.1)	14 (45.2)	0.631	0.76 (0.25, 2.31)
Never	28 (9.8)	9 (29.0)		1.00	16 (5.6)	6 (19.4)		1.00
Washing hands at least five times for 20 seconds each time								
Yes	277 (96.9)	27 (87.1)	0.017	0.21 (0.06, 0.76)	275 (96.2)	28 (90.3)	0.148	0.37 (0.09, 1.41)
No	9 (3.1)	4 (12.9)			11 (3.8)	3 (9.7)		
Traveling								
Once a week	56 (19.6)	4 (12.9)	0.372	0.60 (0.20, 1.81)	8 (2.8)	1 (3.2)	0.341	3.00 (0.31, 28.84)
Once every two weeks					27 (9.4)	2 (6.5)	0.505	1.77 (0.32, 9.65)
Once a month					50 (17.5)	7 (22.6)	0.047	3.36 (1.01, 11.09)
Two or three months					81 (28.3)	16 (51.6)	0.003	4.74 (1.67, 13.45)
Never	230 (80.4)	27 (87.1)			120 (42.0)	5 (16.1)		1.00
Going to a party								
Once a week	56 (19.6)	2 (6.5)	0.091	0.28 (0.06, 1.22)	14 (4.9)	1 (3.2)	0.678	1.60 (0.17, 14.69)
Once every two weeks					33 (11.5)	5 (16.1)	0.065	3.39 (0.92, 12.44)
Once a month					60 (21.0)	9 (29.0)	0.037	3.36 (1.07, 10.47)
Two or three months					67 (23.4)	11 (35.5)	0.020	3.67 (1.22, 11.04)
Never	230 (80.4)	29 (93.5)			112 (39.2)	5 (16.1)		1.00

months) period. Also, in the last 14 days' survey, the chance of the IgG test being positive in players who washed their hands at least five times a day for 20 seconds was 0.21 times versus those who did not follow this health protocol. In the last 6 months, sometimes wearing the mask outside the camp had a 9.54 times higher chance of positive IgG tests than those who always wore masks.

The only parameter with a statistically significant relationship with the positive IgM test was wearing a mask outside the camp and just in the last 14 days.

When the relationship between the positive COVID-19 PCR test and health protocols was investigated, wearing a mask outside the team camp in the last 14 days and wearing masks inside and outside the team camp, as well as going to gyms and restaurants in the last 6 months were the factors that had a statistically significant relationship (Table 2).

PCR tests were 6.60 times more likely to be positive for players who often wore masks outside the camp than those who have always worn masks. The probability of a positive PCR test in players who went to a restaurant or cafe shop 2 or 3 days a week was 3.42 times higher, and for those who went to a club every day was 5.50 times higher than players who have never gone to a cafe shop, restaurant, or club.

Wearing a mask inside the team camp in the last 14 days was the only factor that had a statistically significant relationship with having at least one symptom in the last 14 days (P -value < 0.05). This chance was 0.29 times more for players who often wore masks inside the camp versus those who had never done that (P -value = .011) (Table 3).

In contrast to the short-term period, in the last 6 months, many factors had a P -value < 0.05 when statistically analyzed their relationship with having at least one symptom, such as wearing a mask inside and outside the team camp, maintaining the distance inside and outside the team camp, washing hands, going to parties, and going to restaurants (Table 3).

5. Discussion

We evaluated the efficacy of adhering to health protocol in the short (14 days) and long (6 months) period on the transmission of COVID-19 among elite football players.

In our study, mask-wearing outside and inside the team camp had the most significant relationship with positive anti-SARS-CoV-2 IgG and IgM results, COVID-19 PCR results, and symptomatic. The athletes who wore masks had less probability of having positive COVID-19 PCR, IgG, and IgM results or at least one symptom.

Watson et al., in an assessment of 152,484 high school athletes, implied that mask-wearing was associated with lower COVID-19 incidence among indoor sports and reduced the risk between outdoor sports with extended

close contact among players (11). Another study of 820 interviewees from Hiroshima Prefecture showed that wearing a mask could protect against COVID-19 to a certain degree (12). On the other hand, a study on 633 athletes concluded that mask-wearing harmed athletic performance in high-intensity exercise due to distress and limitation in breathing and high ambient temperature (13). Pifarre et al. assessed eight subjects and found that using a mask during exercise leads to hypoxic and hypercapnic breathing and increased effort (14).

This research showed that indoor and outdoor team camp mask-wearing decreases positive COVID-19 tests and being symptomatic and can be a protective factor; however, evaluating the cost and benefits of wearing a mask during high-intensity training requires more research.

A systematic review and meta-analysis of 172 studies on COVID-19, severe acute respiratory syndrome (SARS), and Middle East respiratory syndrome (MERS) proved that at least 1 meter of physical distancing is associated with a considerable decrease in infection and distances of 2 meters might be more effective (15). Another study using de-identified smartphone GPS and Johns Hopkins Coronavirus Resource Center data demonstrated that higher social distancing was associated with notable decreases in COVID-19 incidence and mortality (16). Following the previous research, our investigation displayed that in addition to mask-wearing, athletes who did not keep a distance inside the team camp had a higher risk of a positive IgG test. Likewise, physical distancing inside and outside the camp causes athletes to be less symptomatic in the long-term evaluation.

Furthermore, a study that assessed 137 serum samples indicated that SARS-CoV-2 IgG antibodies are significantly less detectable in PCR-positive asymptomatic contacts compared to PCR-positive outpatients (17). Evaluation of COVID-19 PCR and symptoms of 784 professional football players demonstrated that many cases were asymptomatic despite positive PCR results (18). Therefore, a possible reason for maintaining social distance inside and outside the camp with a positive IgG test and being symptomatic versus a positive PCR test is that when athletes are symptomatic or have a positive IgG test, the viral load is higher compared to being PCR positive and asymptomatic; however, athletes who did not keep social distance, had higher viral load when infected.

In our study, athletes with positive IgG tests should have followed hand hygiene instructions properly in the last 14 days. Besides, athletes who did not wash their hands at least five times daily in the last 6 months were likelier to have one symptom. In the last 6 months' survey, athletes who traveled, partied, or went to the gym and restaurants had a higher risk for positive PCR or IgG tests and being symptomatic.

Table 2. The Relationship Between Adhering to Health Protocols in the Last 14 Days and the Last 6 Months with COVID-19 Polymerase Chain Reaction (PCR) Results

Adhering to Health Protocols	14 Days				6 Months			
	PCR, No. (%)							
	Negative	Positive	P-Value	OR (95% CI)	Negative	Positive	P-Value	OR (95% CI)
Wearing a mask inside the team camp								
Always	92 (33.5)	10 (21.7)	0.804	0.81 (0.16, 4.09)	87 (31.6)	11 (23.9)	0.113	0.34 (0.09, 1.28)
Often	84 (30.5)	9 (19.6)	0.792	0.80 (0.15, 4.09)	66 (24.0)	10 (21.7)	0.195	0.41 (0.11, 1.56)
Sometimes	53 (19.3)	11 (23.9)	0.591	1.55 (0.31, 7.80)	69 (25.1)	5 (10.9)	0.030	0.19 (0.04, 0.85)
Rarely	31 (11.3)	14 (30.4)	0.136	3.35 (0.68, 16.86)	42 (15.3)	16 (34.8)	0.943	1.04 (0.29, 3.77)
Never	15 (5.5)	2 (4.3)		1.00	11 (4.0)	4 (8.7)		1.00
Wearing a mask outside the team camp								
Always	165 (60.0)	15 (32.6)		1.00	164 (59.6)	11 (23.9)		1.00
Often	83 (30.2)	20 (43.5)	0.008	2.65 (1.29, 5.44)	67 (24.4)	22 (47.8)	<0.001	4.80 (2.25, 10.65)
Sometimes	15 (5.5)	9 (19.6)	<0.001	6.60 (2.47, 17.60)	25 (9.1)	11 (23.9)	<0.001	6.56 (2.57, 16.72)
Rarely	7 (2.5)	2 (4.3)	0.176	3.14 (0.59, 16.49)	15 (5.5)	2 (4.3)	0.399	1.98 (0.40, 9.81)
Never	5 (1.8)	0 (0.0)	1.00	-	4 (1.5)	0 (0.0)	1.00	-
Going to gyms								
Daily					72 (26.3)	13 (28.3)	0.029	5.50 (1.19, 25.36)
2 to 3 days a week					79 (28.8)	17 (37.0)	0.014	6.56 (1.46, 29.49)
Once a week					23 (8.4)	5 (10.9)	0.030	6.63 (1.20, 36.60)
Once every two weeks					19 (6.9)	5 (10.9)	0.018	8.02 (1.43, 44.76)
Once a month					20 (7.3)	4 (8.7)	0.045	6.10 (1.03, 35.85)
Never					61 (22.3)	2 (4.3)		1.00
Going to restaurants or cafe shops								
Daily					14 (5.1)	3 (6.5)	0.486	1.65 (0.40, 6.76)
2 to 3 days a week					27 (9.8)	12 (26.1)	0.011	3.42 (1.32, 8.82)
Once a week					25 (9.1)	4 (8.7)	0.742	1.23 (0.35, 4.25)
Once every two weeks					66 (24.0)	9 (19.6)	0.921	1.05 (0.40, 2.73)
Once a month					66 (24.0)	8 (17.4)	0.891	0.93 (0.34, 2.50)
Never					77 (28.0)	10 (21.7)		1.00

Bagepally et al. executed a decision tree and Markov model-based economic evaluation, demonstrating that hand hygiene was a cost-effective preventive COVID-19 strategy (19). Delen et al., based on the SIR model and official COVID-19 reports, showed that controlling people's attendance and mobility in highly public places helps to reduce disease transmission rates (20). Our study is in the same direction as previous studies that hand hygiene and public gathering affected the prevention of COVID-19. However, our research implied that they are less crucial than wearing masks or distancing inside or outside the team camp elite football players.

The limitations of this study are as follows: the limited time to collect the data, the need for more accessible access

to the professional football players' data, and the absence of a standard questionnaire at the time of the study.

5.1. Conclusions

In conclusion, our findings demonstrated that wearing a mask and physically distancing 6 feet inside and outside of the team camp had the most significant relationship with COVID-19 positive serology tests and PCR and symptoms, respectively.

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Table 3. The Relationship Between Adhering to Health Protocols in the Last 14 Days and the Last 6 Months with Having at Least One COVID-19 Symptom

Adhering to Health Protocols	14 Days				6 Months			
	Having at Least one Symptom, No. (%)							
	Negative	Positive	P-Value	OR (95% CI)	Negative	Positive	P-Value	OR (95% CI)
Wearing a mask inside the team camp								
Always	86 (31.7)	16 (32.0)	0.062	0.34 (0.11, 1.05)	83 (31.1)	15 (27.8)	0.029	0.27 (0.08, 0.87)
Often	80 (29.5)	13 (26.0)	0.040	0.29 (0.09, 0.94)	66 (24.7)	10 (18.5)	0.018	0.22 (0.06, 0.77)
Sometimes	54 (19.9)	10 (20.0)	0.078	0.34 (0.10, 1.12)	67 (25.1)	7 (13.0)	0.005	0.15 (0.04, 0.57)
Rarely	40 (14.8)	5 (10.0)	0.034	0.22 (0.05, 0.69)	42 (15.7)	16 (29.6)	0.354	0.57 (0.17, 1.86)
Never	11 (4.1)	6 (12.0)		1.00	9 (3.4)	6 (11.1)		1.00
Wearing a mask outside the team camp								
Always	153 (56.5)	27 (54.0)	0.156	0.26 (0.04, 1.65)	159 (59.6)	16 (29.6)	0.026	0.101 (0.01, 0.76)
Often	88 (32.5)	15 (30.0)	0.153	0.25 (0.03, 1.66)	68 (25.5)	21 (38.9)	0.254	0.30 (0.04, 2.32)
Sometimes	21 (7.7)	3 (6.0)	0.162	0.21 (0.02, 1.85)	24 (9.0)	12 (22.2)	0.513	0.500 (0.06, 3.99)
Rarely	6 (2.2)	3 (6.0)	0.803	0.75 (0.07, 7.21)	14 (5.2)	3 (5.6)	0.194	0.21 (0.02, 2.18)
Never	3 (1.1)	2 (4.0)		1.00	2 (0.7)	2 (3.7)		1.00
Keeping the distance inside the team camp								
Always	64 (23.6)	12 (24.0)	0.954	0.96 (0.33, 2.80)	60 (22.5)	9 (16.7)	0.019	0.26 (0.08, 0.80)
Often	37 (13.7)	7 (14.0)	0.970	0.97 (0.29, 3.21)	41 (15.4)	10 (18.5)	0.133	0.42 (0.14, 1.29)
Sometimes	81 (29.9)	10 (20.0)	0.420	0.63 (0.21, 1.90)	107 (40.1)	8 (14.8)	0.001	0.13 (0.04, 0.40)
Rarely	58 (21.4)	15 (30.0)	0.586	1.33 (0.47, 3.78)	45 (16.9)	19 (35.2)	0.561	0.73 (0.26, 2.05)
Never	31 (11.4)	6 (12.0)		1.00	14 (5.2)	8 (14.8)		1.00
Keeping the distance outside the team camp								
Always	86 (31.7)	13 (26.0)	0.779	1.36 (0.15, 11.64)	84 (31.5)	12 (22.2)	0.026	0.14 (0.02, 0.79)
Often	83 (30.6)	13 (26.0)	0.754	1.41 (0.16, 12.06)	87 (32.6)	10 (18.5)	0.014	0.11 (0.02, 0.64)
Sometimes	56 (20.7)	13 (26.0)	0.502	2.08 (0.24, 17.97)	62 (23.2)	16 (29.6)	0.117	0.25 (0.04, 1.40)
Rarely	37 (13.7)	10 (20.0)	0.424	2.43 (0.27, 21.53)	31 (11.6)	13 (24.1)	0.324	0.41 (0.07, 2.35)
Never	9 (3.3)	1 (2.0)		1.00	3 (1.1)	3 (5.6)		1.00
Washing hands at least five times for 20 seconds each time			0.348	2.66 (0.34, 20.76)				
Yes	257 (94.8)	49 (98.0)			257 (96.3)	48 (88.9)	0.031	0.31 (0.10, 0.89)
No	14 (5.2)	1 (2.0)			10 (3.7)	6 (11.1)		
Never	218 (80.4)	40 (80.0)						
Going to a party								
Once a week	46 (17.0)	14 (28.0)	0.069	1.90 (0.95, 3.80)	11 (4.1)	4 (7.4)	0.079	3.18 (0.87, 11.56)
Once every two weeks					30 (11.2)	8 (14.8)	0.091	2.33 (0.87, 6.23)
Once a month					54 (20.2)	18 (33.3)	0.009	2.91 (1.31, 6.49)
Two or three months					67 (25.1)	12 (22.2)	0.304	1.56 (0.66, 3.69)
Going to restaurants or cafe shops								
Daily					10 (3.7)	7 (13.0)	0.001	8.00 (2.32, 27.55)
2 to 3 days a week					32 (12.0)	7 (13.0)	0.110	2.50 (0.81, 7.70)
Once a week					23 (8.6)	6 (11.1)	0.071	2.98 (0.91, 9.975)
Once every two weeks					57 (21.3)	18 (33.3)	0.007	3.60 (1.41, 9.21)
Once a month					65 (24.3)	9 (16.7)	0.387	1.58 (0.55, 4.47)
Never					80 (30.0)	7 (13.0)		1.00

Medical Assessment and Rehabilitation Center (Ifmarc) in Tehran, Iran.

Footnotes

Authors' Contribution: Hooman Angoorani and Molood Jafari Fesharaki gave substantial contributions to the conception or the design of the manuscript. Molood Jafari Fesharaki, Paniz Jahani, Marzieh Urumieh, Bita Zoghalchi, and Soheila Masoudi acquired, analyzed, and interpreted the data. Molood Jafari Fesharaki contributed to drafting the manuscript. All authors read and approved the final version of the manuscript.

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