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Exercise Habits of Armenians Before and After the Emergence of the COVID-19 Pandemic

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Abstract

The COVID-19 pandemic brought about a variety of changes in people's lifestyles, including their exercise habits. This study examined changes in exercise habits in individuals of Armenian descent, before and after the emergence of COVID-19, to determine whether significant changes had occurred. Convenience sampling was used by distributing the study throughout Armenian organizations, culturally-relevant social media pages, websites, and email lists. Subjects were required to be at least 18 years of age and of Armenian descent. Survey data was collected between June and August of 2020 from 502 subjects on exercise history, health history, and anthropometry. Disease scores were assigned based on health status. Subjects with higher disease scores were 2.5 and 3.1 times more likely to not exercise prior to and after the pandemic, respectively, compared to subjects with lower disease scores ($p<0.001$). However, there was no significant difference in change in exercise frequency after the emergence of the pandemic. Additionally, subjects who only exercised in the gym prior to COVID-19 were more likely to decrease their exercise frequency compared to subjects who did not exercise at the gym or did not solely exercise at the gym ($p<0.001$). Clinicians should place greater emphasis on encouraging Armenian patients with high disease scores to exercise. Armenian patients should also be encouraged to diversify their exercise spaces beyond the gym in order to reduce the risk of decreasing exercise frequency in the event of gym closures due to unforeseen circumstances.

Keywords: Armenians; Comorbidities; COVID-19; Exercise frequency; Physical activity; Preventative care

Abbreviations

BMI: Body Mass Index; CI: Confidence Interval; COPD: Chronic Obstructive Pulmonary Disease; COVID-19: Coronavirus Disease 2019; NGO: Non-Governmental Organization; OR: Odds Ratio

Introduction

The COVID-19 (Coronavirus Disease 2019) pandemic brought about many changes in people's lifestyles due to social distancing mandates. Over the course of the pandemic, regulations across different jurisdictions began increasingly restricting access to public spaces, leading to widespread limitations and closures of fitness facilities and gyms [1,2]. Moreover, implementation of social distancing and general concerns for the potential of infection further reduced the use of these facilities by the public [2,3]. Consequently, exercise was often limited to people's homes or to outdoor spaces [4,5]. An emerging public health concern following the reduced use of public gyms and the access restrictions placed on these fitness facilities was the potential negative impact on exercise habits for individuals who frequented these spaces prior to the onset of the pandemic [6,7]. Moreover, those with multiple comorbidities and higher disease risk factors may be particularly impacted as a result of these changes.

The purpose of the following study was to understand the consequences of the COVID-19 pandemic on exercise habits while accounting for the fact that cultural factors can influence individuals to display certain types of lifestyles or behaviors. Thus, the study chose to specifically focus on how the pandemic may have affected exercise habits in the Armenian population. The study analyzed exercise frequencies in Armenian populations before and after the onset of the COVID-19 pandemic, as well as the impact of exercise location on exercise frequency.

Since exercise habits are exhibited differently in individuals with different comorbidities, it is important to adequately categorize these populations based on health status. Disease scores are often used in research to categorize subjects based on the presence of certain diseases. Diseases that can be considered when establishing a disease score include hypercholesterolemia, hypertension, type 2 diabetes, asthma, Chronic Obstructive Pulmonary Disease (COPD), cardiovascular disease, and obesity (body mass index >30kg/m^2).

Considering the closure of publicly-accessible fitness facilities, the study aimed to determine whether the emergence of the COVID-19 pandemic impacted people's exercise habits. Therefore, the following hypotheses were made:

- There is a significant difference in exercise frequency prior to the emergence of COVID-19, between Armenians with higher disease scores (as assigned by the research team) compared to Armenians with lower disease scores.
- There is a significant difference in exercise frequency after the emergence of COVID-19, between Armenians with higher disease

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scores compared to Armenians with lower disease scores.

- There is a significant difference in change in exercise frequency after the emergence of the COVID-19 pandemic between Armenians with higher disease scores compared to Armenians with lower disease scores.

- There is a significant difference in change in exercise frequency after the emergence of the COVID-19 pandemic between Armenians who typically exercised only in the gym prior to the emergence of the pandemic compared to Armenians who exercised in other locations prior to the emergence of COVID-19.

Methods

Participants

To meet inclusion criteria, subjects were required to be at least 18 years of age and of Armenian descent. Convenience sampling was used by distributing the survey throughout Armenian community centers and Non-Governmental Organizations (NGOs), as well as major culturally-relevant social media pages, websites and email lists.

Institutional Review Board approval for the study was obtained from Touro University California (Protocol #M-1320). Informed consent was obtained from subjects prior to granting them access to an online survey via Qualtrics, which was available from June 28, 2020 to August 1, 2020. Participants could alternatively complete the survey by phone by contacting the research team directly. The estimated response time for the survey was less than 15 minutes. A minimum required sample size of 272 participants was calculated based on an α value (two-tailed) of 0.05, a β value of 0.2, a presence/absence ratio of 1.0, a baseline risk of 50%, and an expected OR of 2.0.

Protocol

In order to quantify the health status of subjects, the concept of using a disease score was applied. A disease score was established, which ranged on a scale of 0 to 7. Subjects reported whether they had ever been diagnosed with hypercholesterolemia, hypertension, type 2 diabetes, asthma, COPD, or a cardiovascular disease. The presence of each diagnosis then allotted 1 point to a subject's disease score. Additionally, subjects reported their heights and weights, which allowed for the calculation of their Body Mass Index (BMI). The BMI of subjects was calculated using the following formula: BMI=weight/height^2 [8]. Since the diagnosis of obesity is based on an individual's BMI, 1 additional point was assigned to each subject's disease score with a BMI of ≥30 kg/m^2.

To differentiate subjects based on health status, subjects were categorized as either having a low or high disease score. A disease score of 0-2 (inclusively) was considered a low disease score, while a disease score of 3-7 (inclusively) was considered a high disease score.

To calculate change in exercise-days, exercise-days prior to the onset of the COVID-19 pandemic were subtracted from the exercise-days after the onset of the pandemic for each subject. Those with a negative change were said to have "decreased exercise frequency," while those with a positive or no change were said to have "not decreased exercise frequency."

Statistical analysis

All statistical analyses and sample size calculations were performed using Stata IC 15.1 (2017). The survey results were first inputted into Stata and 2x2 contingency tables were constructed, as required for each tested hypothesis. Associations between the various measures shown in the contingency tables of Table 1 and Table 2 were tested using Pearson's chi-squared test (χ^2). Additionally, an Odds Ratio (OR) as well as 95% Confidence Intervals (CI) were obtained for each association. The significance was set at $p < 0.05$ for all outcomes.

Results

There was a total of 593 survey participants. In total, 91 responses were not included in the analysis due to incomplete survey responses. Thus, final calculations and reports were based on a sample size of 502 participants, with a relatively even distribution between genders (49% male, 51% female). 45% of responders were 18-40 years old, 25% were 41-60 years old, and 30% were 60 years of age or older. Survey responders were Armenians residing in 21 countries (Figure 1). The majority of responders were residing in the United States of America (75%), followed by Canada (8%), Armenia (7%), and Lebanon (2%). Armenians residing in the 17 other countries collectively comprised 8% of the survey responders.

Based on survey responses, prior to the emergence of the pandemic, the most common exercise locations were outdoors and the gym. After the pandemic, the most common exercise location was the home, followed by outdoors. Both prior to and after the emergence of COVID-19, aerobic exercise was the most common type of exercise that subjects engaged in, followed by strength training. Flexibility was the least common type of exercise reported, with less than 2% of subjects working on flexibility prior to the emergence of the pandemic.

Table 1 shows participants' exercise habits before and after the onset of the COVID-19 pandemic in subjects with low and high disease scores. The Pearson's chi-squared tests performed on the contingency tables from Table 1 showed that there is a significant difference in exercise frequency prior to and following the emergence of COVID-19 between Armenians with higher disease scores compared to Armenians with lower disease scores. Subjects with higher disease scores were 2.5 times (95% CI 1.47, 4.37) more likely to report 0 days of exercise per week prior to the emergence of the pandemic, compared to subjects with lower disease scores ($p<0.001$). Additionally, subjects with higher disease scores were also 3.1 times

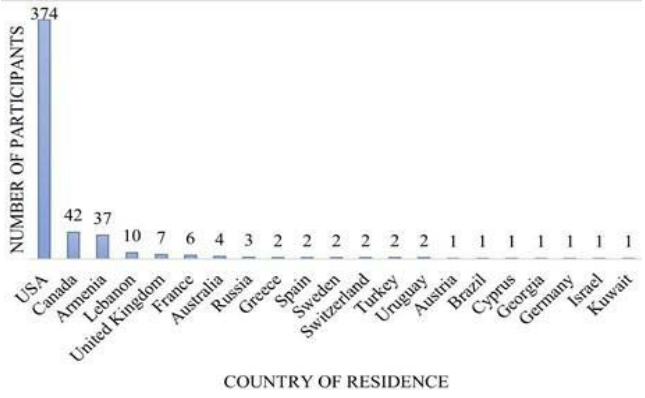

Figure 1: Survey participants' country of residence.

Table 1: Exercise habits before and after the emergence of COVID-19 in subjects with low/high disease scores.

	High disease score	Low disease score
	Before emergence of COVID-19	
Zero exercise days/week	29	119
Greater than or equal to 1 day of exercise per week	31	323
	After emergence of COVID-19	
Zero exercise days/week	36	144
Greater than or equal to 1 day of exercise per week	24	298
	Before compared to after the emergence of COVID-19	
Decreased exercise frequency	12	132
Did not decrease exercise frequency	48	310

Table 2: Calculated changes in participants' exercise frequency in different fitness spaces.

	Exercised only in gym pre-COVID-19	Exercised in other locations pre-COVID-19
Decreased exercise frequency post-COVID-19 emergence	54	86
Did not decrease exercise frequency post-COVID-19 emergence	35	186

(95% CI 1.79, 5.37) more likely to report 0 days of exercise per week after the emergence of COVID-19, compared to subjects with lower disease scores ($p<0.001$). However, there was no significant difference in change in exercise frequency between subjects with higher disease scores compared to subjects with lower disease scores after the emergence of the pandemic.

Table 2 shows calculated changes in participants' exercise frequency in different fitness spaces. The Pearson's chi-squared tests performed on the contingency table from Table 2 showed that subjects who typically exercised only in the gym prior to the emergence of the pandemic were 3.34 times (95% CI 2.04, 5.47) more likely to decrease their exercise frequency compared to subjects who did not exercise at the gym or those who did not solely exercise at the gym ($p<0.001$) prior to the emergence of the pandemic.

Discussion

For healthcare providers, a critical component of a patient visit is patient education. Given the findings that subjects with higher disease scores were more likely to report 0 days of exercise per week both before and after the onset of the pandemic, clinicians should be more attentive to providing exercise recommendations to patients with multiple comorbidities, particularly those with at least 3 of the following: hypercholesterolemia, hypertension, type 2 diabetes, asthma, COPD, cardiovascular disease, and obesity.

While educating patients on lifestyle modifications and providing exercise recommendations, exercise frequency and exercise type are two of the key components that are commonly addressed. Healthcare providers can consider incorporating exercise location into their exercise recommendations, given the findings that Armenians who only exercised in the gym prior to the emergence of COVID-19 were more likely to decrease their exercise frequency after the emergence of the pandemic, regardless of whether or not they engaged in exercise in other locations after the pandemic. They should consider encouraging patients of Armenian descent to not limit their exercise to the gym only, since this places them at greater risk of decreasing their exercise frequency in the event of gym closures or unforeseen changes beyond their control. Although exercising solely in the gym is not recommended, exercising in the gym alone is better than not exercising at all. Clinicians should therefore use their best judgement to determine the appropriate recommendations for patients while considering each patient as a unique individual with specific needs. Clinicians could initiate a patient-centered discussion with each patient to find out what types of physical activity the patient enjoys and how exercise frequency can be increased. Based on patient preferences and abilities, clinicians should then advise on exploring different exercise locations, such as in outdoor spaces or in their homes. For patients who exercise solely in the gym, clinicians should encourage them to consider diversifying their locations of fitness to other locations in addition to exercising in the gym.

This study has a number of limitations that should be considered. Although this study intended to be inclusive of Armenians from all parts of the world, responses were received from Armenians residing in only 21 countries. Since convenience sampling was used, people who do not regularly access the internet, or those who live in less-developed regions with limited internet access, were less likely to be captured by the sampling method, and less likely to participate in the study.

In conclusion, based on the findings in this study, clinicians should place greater emphasis on educating Armenian patients with multiple existing health conditions to exercise, since this population is more likely to not exercise regardless of the absence or presence of a pandemic. Study results indicate that clinicians should consider encouraging patients of Armenian descent to not limit their exercise to the gym only, as this places them at increased risk of decreasing their exercise frequency in the event of gym closures.

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