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## IMPACT OF COVID-19 CONFINEMENT ON PHYSICAL ACTIVITY AND DIETARY HABITS IN PHYSICAL THERAPY STUDENTS AND PROFESSIONALS IN LEBANON: A CROSS-SECTIONAL STUDY

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# IMPACT OF COVID-19 CONFINEMENT ON PHYSICAL ACTIVITY AND DIETARY HABITS IN PHYSICAL THERAPY STUDENTS AND PROFESSIONALS IN LEBANON: A CROSS-SECTIONAL STUDY

## Abstract

COVID-19 pandemic caused radical changes to the daily living activities of Lebanese population since it led the government to adopt restrictive measures and force obligatory confinement. This study aimed to identify the dietary, using Prevention with Mediterranean Diet (PREDIMED), and physical activity, using International Physical Activity Questionnaire- short form (IPAQ-SF), among physical therapy students and professionals residing in Lebanon before and during the COVID-19 confinement period. A cross-sectional descriptive study based on self-administered questionnaires was carried out from late January to the beginning of February, which coincides with the third home confinement period. Surveys were disseminated through multiple social media platforms for physical therapy students and professionals. According to PREDIMED, the adherence to Mediterranean diet increased to 44.1% during confinement versus 40.2% before confinement (P

## Keywords

COVID-19, Confinement, Physical Therapy, Students, Mediterranean Diet, Physical activity

## 1. INTRODUCTION

In February 2020, the novel COVID-19 that originally commenced in China, was spotted in Lebanon. According to the world health organization (WHO), COVID-19 is a disease caused by a new coronavirus called SARS-CoV-2, which affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization (Lechien et al., 2020).

This pandemic caused radical changes to the daily living activities of Lebanese population since it led the government to adopt restrictive measures and force obligatory house confinement to reduce the virus propagation and the number of positive cases. With similar procedures applied worldwide, studies performed under the spotlight of COVID-19 showed an association between the period of confinement and an increase in the negative psychological effects as stress and anxiety (Brooks et al., 2020).

These negative effects were claimed to lead to inappropriate behaviors as decline in physical activity, increase in a sedentary lifestyle, and change in dietary habits, which can subsequently increase the risk of developing chronic diseases as obesity, diabetes, cardiovascular disease, cancer (López-Bueno et al., 2020; Sánchez-Sánchez et al., 2020), and thus increase mortality rates. In Spain, confinement period has been found to induce negative effect on physical activity intensity and rise in the consumption of less healthy food (Cristina Romero-Blanco et al., 2020).

Physical fitness is usually attained through proper nutrition (Asigbee, Whitney, & Peterson, 2018), moderate-vigorous physical exercise, and physical activity (Drenowatz, Prasad, Hand, Shook, & Blair, 2016). Recommendations during the confinement period are to follow a healthy balanced diet and avoid overeating. The optimal diet should depend on carbohydrates with a low glycemic index, such as legumes or fruits, vegetables, healthy fats and food rich in proteins with a lower percentage of fat (Martinez-Ferran, de la Guía-Galipienso, Sanchis-Gomar, & Pareja-Galeano, 2020).

The Mediterranean diet, recommended by the Dietary Guidelines for Americans and is also recognized by the World Health Organization as a healthy and sustainable dietary pattern, is one of the healthiest dietary patterns worldwide (Widmer, Flammer, Lerman, & Lerman, 2015) known for its preventive effect of cardiovascular diseases and type-2 diabetes and several chronic diseases (Estruch et al., 2018). The Mediterranean diet is variant and includes vegetables, fruits, herbs, nuts, beans and whole grains. Its meals depend on plant-based foods with moderate quantities of dairy, poultry and eggs, and seafood (Widmer et al., 2015).

Exercise forms a major component in the prevention of most chronic diseases. Human body needs a relatively long period to utilize the healthy adaptations that exercise produce but it takes a very brief period to lose these benefits with the body returning to baseline physiological status or even worse (Martinez-Ferran et al., 2020). It has been claimed that physical activity should be increased to at least 200 min per week to compensate for the decrease in the normal daily levels during the confinement period (Jiménez-Pavón, Carbonell-Baeza, & Lavie, 2020).

With isolation and limitations in participating in regular physical activities, a decline in physical activity was commonly reported. A comparison was made between the physical activity and energy expenditure before and after the lockdown period among physiotherapy professionals and students in India reporting a decrease of 48% and 49% respectively in both (Srivastav, Sharma, & Samuel, 2021). Physical inactivity has been accused to induce multiple infections, drowsiness, lethargy, obesity and other psychological problems among different individuals (Srivastav et al., 2021).

Physiotherapy is a profession that demands regular physical activity and high levels of physical fitness by the professionals not only for their own benefit, but also because of their position as fitness role models in society. Surveys of physicians and medical students have shown that those who are physically active are more likely to counsel their patients on the benefits of activity (Multani & Singh, 2013).

Therefore, the aim of this study was to investigate the impact of COVID 19 confinement on fitness level and healthy behaviors by measuring the adherence to Mediterranean diet and physical activity status among physical therapy students and professionals before and during confinement.

## 2. MATERIALS AND METHODS

### 2.1. Selection of Participants and Study Design

A cross-sectional descriptive study based on a self-administered questionnaire was carried out. The target sample was composed of physical therapy undergraduate students, physical therapy postgraduate students not practicing their profession, and professional physical therapists residing in Lebanon. Postgraduate students practicing physical therapy in Lebanon were considered among professionals' group. According to World Physiotherapy (WPT), the number of physical therapists in 2020 in Lebanon was 1247 (Physiotherapy, 2020). Considering the unknown proportion of the change in physical therapist's number and with confidence level 95% and margin error 5%, the ideal sample size was calculated and deduced to be 247 participants. The link to the questionnaire was sent through social platforms to all physical therapy students and alumni from the year 2012 of Beirut Arab University and consequently the responders were free to accept or reject their response to the survey.

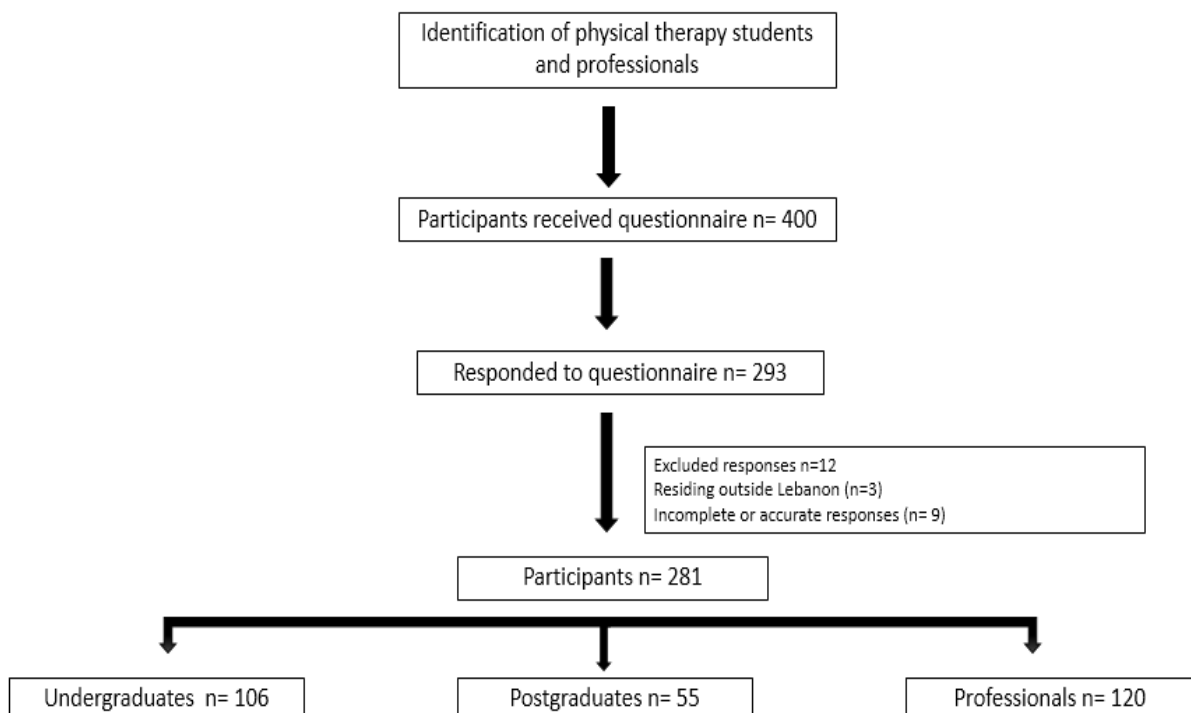


Fig.1: Flow chart of the study

### 2.2. Instruments and Variables

Data for this study were obtained from three separate questionnaires. The first one was used to collect socio-demographic variables such as age, professional status, place of residence, and number of people in residence. In section two, questions regarding smoking and eating habits were included along with anthropometric measures as weight and height and the 14- item assessment tool from the Prevention with Mediterranean Diet group (PREDIMED) (Martínez-González et al., 2012) used to evaluate the adherence to Mediterranean diet. The questionnaire is composed of 14 questions concerned with assessing the consumption of Mediterranean diet food, each response scores one point. Participants with the lowest adherence to the Mediterranean diet (score less than or equal to 7, reference category) and those with higher levels of adherence (8–9, or equal or more than 10) (Martínez-González et al., 2012).

Section three, considered as the last section of the survey, was designed to assess the physical activity before and during the lockdown. It contained questions extracted from a pilot study carried out among 20 subjects to verify the effectiveness of these questions in assessing the engagement in physical exercise and the time spent performing the exercise.

These questions were designed based on opinions of physical activity experts. After this pilot study questions were modified due to a lack of understanding which may cause an interpretation error (Sánchez-Sánchez et al., 2020). This section also included the International Physical Activity Questionnaire – Short Form English version that contains seven questions assessing the intensity and the type of physical activity, which has been validated and recommended as an efficient method to assess physical activity (Craig et al., 2003)

The IPAQ was used to assess the total minutes of physical activity per week during the confinement performing different types of activity: vigorous (i.e. heavy lifting, performing intense aerobic exercises); moderate (i.e. carrying light loads and bicycling at a regular pace carry, work out in the garden); walking activities, as well as the sitting time per day. Responses were converted to Metabolic Equivalent Task minutes per week (METmin/week) through automatic scoring of the IPAQ-S. Based on the IPAQ scoring protocol, classification of the participants was in three different groups low, moderate, and high (Regaieg, Charfi, Yaich, Damak, & Abid, 2016).

### 2.3. Data Collection

The data was collected during the third confinement period forced by the Lebanese government from 30 January till 6 February 2021. The questionnaires were administered as a Google Forms survey and disseminated through different social platforms as WhatsApp, Gmail, and Telegram. The first page of the survey consisted of a declaration statement acknowledging the participants about the purpose and requirements for participating in the study along with their consent. Participation in this study was completely optional and voluntary. The interviewed person was not asked for any personal identification data as the name or ID number; hence all of the questionnaires were anonymous. At the end, 293 respondents agreed to participate in this study and completed the survey.

### 2.4. Statistical Analysis

After the responses were collected, the data were extracted as a Microsoft Excel worksheet and then analyzed using the statistical package for social sciences (SPSS) v25. The data obtained from the variables were represented in a descriptive way by frequency and percentage for categorical variables and mean with standard deviation (SD) for the quantitative variables. Using the Pearson Chi-Square test, it was deduced whether there is a significant difference between the three sample groups with respect to each variable, in addition to the responses to each item in the diet questionnaire before and during the confinement. Levels of significance were set at  $p < .05$ .

## 3. RESULTS

An overall number of 293 responses was recorded. Participants residing outside Lebanon were excluded ( $n=3$ ) along with incomplete or accurate responses ( $n=9$ ). Among the remaining sample size ( $n=281$ ), 37.7% were undergraduate, 19.6% were postgraduate, and 42.7% were professionals. Ages ranged from 18 years being the lower most and 57 years being the highest with a significant difference  $p < .001$  between the three groups.

The majority of each sample group had normal BMI with 47% of undergraduates, 20% of postgraduates, and 54% of professionals reported no weight change during the confinement where the greatest percentage the weight gain responses among the three groups were between 1 and 3 Kg.

Table 1: Socio-demographic and anthropometric variables of responders.

	Variables	Undergraduate	Postgraduate	Professionals	P-Value
	<b>Number of Subjects</b>	106 (37.7%)	55 (19.6%)	120 (42.7%)	
	<b>Age</b>	18.00 - 27.00 23±3.6	22.00- 49.00 28±6.4	23.00- 57.00 33.5±7.6	
<b>BMI</b>	<b>Underweight</b>	12.3%	3.6%	0.0%	.006*
	<b>Normal Weight</b>	59.4%	60.0%	54.2%	
	<b>Pre-Obesity</b>	20.8%	27.3%	35.0%	
	<b>Obesity Class I</b>	6.6%	7.3%	8.3%	
	<b>Obesity Class II</b>	0.9%	1.8%	2.5%	
<b>Residence</b>	<b>Beirut</b>	62 (58.5%)	27 (49.1%)	40 (33.3%)	
	<b>Mount Lebanon</b>	20 (18.9%)	11 (20.0%)	39 (32.5%)	
	<b>South Lebanon</b>	14 (13.2%)	10 (18.2%)	10 (8.3%)	
	<b>Bekaa</b>	6 (5.7%)	3 (5.5%)	10(8.3%)	
	<b>Baalbeck-Hermel</b>	0 (0.0%)	1 (1.8%)	0 (0.0%)	
	<b>North Lebanon</b>	1 (0.9%)	0 (0.0%)	9 (7.5%)	
	<b>Akkar</b>	0 (0.0%)	2 (3.6%)	0 (0.0%)	
	<b>Nabatiyeh</b>	3 (2.8%)	1 (1.8%)	12 (10.0%)	
<b>Number of people in residence</b>	<b>Alone</b>	0 (0.0%)	0 (0.0%)	3 (2.5%)	< .00*
	<b>With two to five persons</b>	73 (68.9%)	45 (81.8%)	86 (71.7%)	
	<b>With more than five</b>	34 (32.1%)	10 (18.2%)	31 (25.8%)	
<b>Smoking</b>	<b>Cigarettes</b>	15 (14.2%)	11 (20.0%)	22 (18.3%)	.157
	<b>Hubble-bubble / Hookah</b>	20 (18.9%)	18 (32.7%)	34 (28.3%)	
<b>Frequency during confinement</b>	<b>Increased</b>	12 (11.3%)	7 (12.7%)	21 (17.5%)	.175
	<b>Decreased</b>	17 (16.0%)	11 (20%)	10 (8.3%)	
	<b>Remained the same</b>	58 (54.7%)	31 (56.36%)	74 (61.7%)	
<b>Weight change during confinement</b>	<b>Gained weight between 1 and 3 kg</b>	30 (28.3%)	20 (36.4%)	38 (31.7%)	.091
	<b>Gained weight between 3 and 5 kg</b>	9 (8.5%)	3 (5.5%)	10 (8.3%)	
	<b>Gained weight above 5 kg</b>	6 (5.7%)	0 (0.0%)	0 (0.0%)	
	<b>No weight change</b>	47 (44.3%)	20 (36.4%)	54 (45.0%)	
	<b>Lost weight</b>	14 (13.2%)	12 (21.8%)	18 (15.0%)	
<b>How often do you consume a home cooked / prepared meal?</b>	<b>Always</b>	66 (62.3%)	35 (63.6%)	99 (82.5%)	< .00*
	<b>Several occasions</b>	25 (23.6%)	10 (18.2%)	20 (16.7%)	
	<b>Few occasions</b>	14 (13.2%)	5 (9.1%)	0 (0.0%)	
	<b>Do not cook</b>	1 (0.9%)	5 (9.1%)	1 (0.8%)	

\* Level of significance at  $p \leq 0.05$

The majority of participants were residing in Beirut along with two to five people in the residence with a significant p value <.001. The majority of the participants were non-smokers reporting no change in frequency in smoking habits. The highest percentage of always consuming a home cooked meal was recorded among the professional group 82.5%, whereas the highest recorded for few occasions was among the undergraduate group 13.2%. (Table 1)

Response to each item in the PREDIMED questionnaire was analyzed according to the scoring protocol. Each answer that scores one point reflects better adherence to the Mediterranean diet. Before confinement, the items that represented the highest percentage of adherence to Mediterranean Diet were the use of olive oil for cooking 74.7%, consumption of vegetables 39.9%, consumption of red meat, hamburgers, sausages, or cold meats 78.3%, use of butter, margarine, or cream 89.0%, consumption of carbonated beverages and/or sweetened drinks 85.8%, consumption of chicken, turkey, or rabbit meat instead of beef, pork, hamburgers, or sausages 67.3%, and cooked vegetables, 70.1%. After confinement, adherence to the use of olive oil for cooking, consumption of vegetables and red meat slightly increased to 75.1%, 47.7%, and 82.9% respectively. However, the desired adherence to the consumption of butter, beverages, and chicken decreased to 83.9%, 82.9%, and 65.5% respectively. The consumption of cooked vegetables did not prominently vary.

On the other hand, several items had increased amount of consumption after confinement, as the olive oil used for cooking, fruits, fish, legumes, and nuts increased from 22.41% 29.53%, 14.6% to 31.0% ,39.9% to 48.0%, 22.8% to 28.8% respectively. There were no significant statistical differences between both periods except in three items only: the red meat, butter, and wine. (Table 2)

Table 2: Adherence to the 14 items of the PREDIMED questionnaire before and after confinement.

Questions/ Answers to Questionnaire		Before Confinement				During Confinement				P value
		Undergraduate	Postgraduate	Professionals	Total	Undergraduate 106	Postgraduate 55	Professionals 120	Total	
Do you use olive oil for cooking?	Yes	81 76.4%	37 67.3%	92 76.7%	210 74.7%	83 78.3%	39 70.9%	89 74.1%	211 75.1%	0.365
	No	25 23.6%	18 32.7%	28 23.3%	71 25.3%	23 21.6%	16 29.01%	31 25.8%	70 24.9%	
How much olive oil do you consume	3 spoons or less.	83 78.3%	46 83.63%	89 74.16%	218 77.58%	78 73.58%	41 74.54%	79 65.83%	198 70.46%	0.369
	4 spoons or more.	25 23.6%	18 32.7%	28 23.3%	71 25.3%	23 21.6%	16 29.01%	31 25.8%	70 24.9%	
How many vegetable servings (cabbage, cauliflower, lettuce...etc.) do you consume per day? (1 serving = 200 g) (consider side dishes as half a serving)	1 or less.	31 29.2%	24 43.6%	51 42.5%	106 37.7%	26 24.5%	16 29.1%	38 31.7%	80 28.5%	0.102
	2 or more, none of them in salad or raw.	31 29.2%	12 21.8%	20 16.7%	63 22.4%	31 29.2%	15 27.3%	21 17.5%	67 23.8%	
	2 or more, some of them in salad or raw.	44 41.5%	19 34.5%	49 40.8%	112 39.9%	49 46.2%	24 43.6%	61 50.8%	134 47.7%	
How many pieces of fruit, including fresh juice, do you consume every day?	2 or less per day	95 89.62%	46 83.6%	99 82.5%	240 85.4%	83 78.3%	34 61.8%	77 64.2%	194 69.0%	0.292
	3 or more per day	11 10.37%	9 16.3%	21 17.5%	41 14.6%	23 21.7%	21 38.2%	43 35.8%	87 31.0%	
How many portions of red meat, hamburgers, sausages, or cold meat do you consume every day? (portion 100–150 g)	1 or less per day.	76 71.7%	39 70.9%	105 87.5%	220 78.3%	82 77.3%	43 78.2%	108 90.0%	233 82.9%	0.005*
	2 or more per day	30 28.3%	16 29.1%	15 12.5%	61 21.7%	24 22.6%	12 21.8%	12 10.0%	48 17.1%	
How many portions of butter, margarine or cream do you consume every day? Individual portion = 2 g.	1 or less per day	100 94.3%	45 81.8%	105 87.5%	250 89.0%	96 90.6%	44 80.0%	96 80.0%	236 83.9%	0.044*
	2 or more per day.	6 5.7%	10 18.2%	15 12.5%	31 11.0%	10 9.4%	11 20.0%	24 20.0%	45 16.0%	
How many carbonated and/or sugary beverages (Soft drinks, Cola, tonic ...) do you consume every day?	1 or less per day	89 83.9%	44 80.0%	108 90.0%	241 85.8%	88 83%	41 74.5%	104 86.7%	233 82.9%	0.170
	2 or more per day	17 16%	11 20.0%	12 10.0%	40 14.2%	18 17%	14 25.5%	16 13.3%	48 17.1%	
Do you drink wine? How much do you consume per week?	Less than 7 times per week.	9 8.5%	9 16.36%	23 19.2%	41 14.6%	6 5.7%	8 14.5%	23 19.2%	37 13.2%	0.008*
	7 or more times per week.	0	2 3.6%	0	2 0.7%	1 0.9%	3 5.5%	0	4 1.4%	

	I don't drink	97 91.5%	44 80.0%	97 80.8%	238 84.7%	99 93.4%	44 80.0%	97 80.8%	240 85.4%	
How many portions of legumes do you consume per week? (Example: lentils, beans, peas...etc.) (1 dish or portion is 150 g).	2 or less portions per week.	63 59.4%	37 67.3%	69 57.5%	169 60.1%	57 53.8%	33 60.0%	56 46.7%	146 51.9%	0.463
	2 or more portions per week.	43 40.6%	18 32.7%	51 42.5%	112 39.9%	49 46.2%	22 40.0%	64 53.3%	135 48.0%	
How many portions of fish/seafood do you consume per week? (1 dish, piece, or portion = 100–150 g of fish or 4–5 pieces or 200 g of seafood).	2 or less portions per week.	100 94.3%	48 87.3%	111 92.5%	259 92.2%	98 92.5%	49 89.1%	111 92.5%	258 91.8%	0.281
	2 or more portions per week.	6 5.7%	7 12.7%	9 7.5%	22 7.8%	8 7.5%	6 10.9%	9 7.5%	23 8.2%	
How many times per week do you consume industrial bakery (non-homemade), like biscuits, puddings, sweets, or cakes?	1 or less portions per week.	52 49%	28 50.9%	54 45.0%	134 47.7%	38 35.8%	27 49.1%	41 34.2%	106 37.7%	0.691
	2 or more portions per week.	54 51%	27 49.1%	66 55.0%	147 52.3%	68 64.2%	28 50.9%	79 65.8%	175 62.3%	
How many times per week do you consume nuts? (portion 30 g).	2 or less portions per week.	84 79.2%	45 81.8%	88 73.3%	217 77.2%	77 72.6%	39 70.9%	84 70.0%	200 71.2%	0.379
	2 or more portions per week.	22 20.8%	10 18.2%	32 26.7%	64 22.8%	29 27.4%	16 29.1%	36 30.0%	81 28.8%	
Do you preferably consume chicken, turkey, or rabbit meat instead of beef, pork, hamburgers, or sausages? (portion 100–150 g)	Yes	67 63.2%	41 74.5%	81 67.5%	189 67.3%	67 63.2%	41 74.5%	76 63.3%	184 65.5%	0.347
	No	39 36.8%	14 25.5%	39 32.5%	92 32.7%	39 36.8%	14 25.5%	44 36.7%	97 34.5%	
How many times per week do you consume cooked vegetables, pasta, rice or other dishes, seasoned with tomato sauce, garlic, onion, or leek slow-cooked with olive oil?	1 or less portions per week.	39 36.8%	30 54.5%	15 12.5%	84 29.9%	37 34.9%	26 47.3%	20 16.7%	83 29.5%	0.000*
	2 or more portions per week.	67 63.2%	25 45.5%	105 87.5%	197 70.1%	69 65.1%	29 52.7%	100 83.3%	198 70.5%	

\*Level of significance at  $p \leq 0.05$

After analyzing the adherence to each item in the PREDIMED questionnaire, the overall results were interpreted according to the scoring protocol. Prior to confinement, 59.8% of total participants showed low adherence to Mediterranean diet with the greatest adherence 70.9% for postgraduate students while 40.2% of the total sample represented high adherence with 51.7% for professional group (P value = .003)

During confinement, there was a drop in the low adherence percentage to 55.9% and an increase in the high adherence category till 44.1%. There were significant differences before and after confinement with P value < .001. (Table 3)



Table 3: Adherence to Mediterranean diet before and during confinement.

	Before Confinement				During Confinement			
	Undergraduate	Postgraduate	Professionals	Total	Undergraduate	Postgraduate	Professionals	Total
Low adherence	71 67.0 %	39 70.9 %	58 48.3%	168 59.8%	65 61.3%	34 61.8%	58 48.3%	157 55.9%
High adherence	35 33.0 %	16 29.1 %	62 51.7%	113 40.2%	41 38.7%	21 38.2%	62 51.7%	124 44.1%
	X <sup>2</sup> =11.6595 P value .003				X <sup>2</sup> =4.8312 P value .089			
	X <sup>2</sup> =65.9159 P value < .001							

\* Level of significance at  $p \leq .05$

Before confinement, the three sample groups were closely engaged in practicing physical activity 1 to 3 times per week with a total of 46.3%. However, the postgraduate group was the most engaged in overall physical activity practice during the week compared to the undergraduate and professional groups who had relatively higher percentage in absence of any physical activity practice during the week. During confinement, the frequency of practicing physical activity between 1 to 3 times per week increased to 58.4% with the professional group being the most active with percentage 70%, along with the frequency of no physical activity which increased from 18.5% to 20.3%. There was a significant difference in physical activity frequency per week before and during confinement with  $p$  value of 0.013.

The greatest percentage of time spent practicing physical activity was from 10 to 30 minutes which increased slightly from 35.6% before confinement to 38.1% during confinement. However, the percentage of no time spent practicing physical activity also increased from 17.8% before confinement to 20.6% during confinement. The difference between the two periods was also significant with  $p$  value 0.005. (Table 4)

Table 4: Physical activity frequency and duration of practice before and during confinement.

Questions/ Answers to Questionnaire	Before Confinement				During Confinement				P Value
	Undergraduate	Postgraduate	Professionals	Total	Undergraduate	Postgraduate	Professionals	Total	
<b>1. Practice of physical activity weekly.</b> <i>1-3 times per week.</i>	46 43.4%	27 49.1%	57 47.5%	130 46.3%	47 44.3%	33 60.0%	84 70.0%	164 58.4%	0.013
<i>4-5 times per week.</i>	28 26.4%	22 40.0%	24 20.0%	74 26.3%	23 21.7%	7 12.7%	9 7.5%	39 13.9%	
<i>6 or more times per week.</i>	13 12.3%	3 5.5%	9 7.5%	25 8.9%	10 9.4%	5 9.1%	6 5.0%	21 7.5%	
<i>Do not practice any physical activity</i>	19 17.9%	3 5.5%	30 25.0%	52 18.5%	26 24.5%	10 18.2%	21 17.5%	57 20.3%	
<b>2. How long do you spend practicing physical activity in each session?</b> <i>10 to 30 min per session.</i>	36 34.0%	17 30.9%	47 39.2%	100 35.6%	31 29.2%	17 30.9%	59 49.2%	107 38.1%	0.005
<i>31 min to 1 h per session.</i>	22 20.8%	23 41.8%	30 25.0%	75 26.7%	31 29.2%	20 36.4%	34 28.3%	85 30.2%	
<i>More than 1 h per session</i>	28 26.4%	12 21.8%	16 13.3%	56 19.9%	17 16.0%	8 14.5%	6 5.0%	31 11.0%	
<i>Do not practice any physical activity.</i>	20 18.9%	3 5.5%	27 22.5%	50 17.8%	27 25.5%	10 18.2%	21 17.5%	58 20.6%	

Among the 281 respondents to IPAQ questionnaire, 80 answers were excluded as they did not provide accurate responses to the questions. The results were analyzed in terms of days and minutes of physical activity and sitting time per week during the confinement period only. The highest percentage of undergraduate students 46.8% were classified as low physical activity, and the lowest percentage 25.8% was categorized under the high physical activity level. Similarly, the professional sample group had the greatest percentage 54.3% as low classification and the lowest percentage 18.1% under the high classification. On the contrary, the postgraduate group had the greatest percentage 52.9% recorded as moderately active and the lowest percentage 11.8% in the high activity level. The total percentage for the three classifications was greatest for low physical activity 48.8% and lowest for high physical activity 19.4%. (Table 5)

Table 5: Classification of participants according to IPAQ scoring during confinement

	<b>Under graduate</b>	<b>Post graduate</b>	<b>Professional</b>	<b>Total</b>
<b>Low</b> No activity is reported OR Some activity is reported	29 46.8%	12 35.3%	57 54.3%	98 48.8 %
<b>Moderate</b> Either of the following 3 criteria • 3 or more days of vigorous activity of at least 20 minutes per day OR • 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day OR • 5 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of at least 600 MET-minutes/week.	17 27.41%	18 52.9%	29 27.6%	64 31.8 %
<b>High</b> Any one of the following 2 criteria • Vigorous-intensity activity on at least 3 days and accumulating at least 1500 MET-minutes/week OR • 7 or more days of any combination of walking, moderate- or vigorous-intensity activities accumulating at least 3000 MET-minutes/week	16 25.8%	4 11.8%	19 18.1%	39 19.4 %
<b>Total</b>	62	34	105	201

#### 4. DISCUSSION

This study aimed to investigate the effect of COVID19 confinement on physical therapy students and professionals' healthy behaviors through measuring the change of their adherence to Mediterranean diet and engagement in physical activity during the confinement period.

Dietary and physical habits have gained a special relevance during the period of confinement caused by COVID-19. According to the present literature about the impact of COVID 19 confinements on dietary and physical habits, results were contradictory as some showed improvement while others reflected regression.

Prior to and during confinement, the PREDIMED questionnaire items which presented a higher adherence in the population were: olive oil for cooking (74.7% versus 75.1%), consumption of vegetables (39.9% versus 47.7%), consumption of red meat, hamburgers, sausages, or cold meats (78.3% to 82.9%), use of butter, margarine, or cream (89.0% versus 83.9%), consumption of carbonated beverages and/or sweetened drinks (85.8% versus 82.9%), consumption of chicken, turkey, or rabbit meat instead of beef, pork, hamburgers, or sausages (67.3% versus 65.5%), and cooked vegetables (70.1% versus 70.5%). Those which presented a lower adherence were fruits (14.6% versus 31.0%), consumption of wine (0.7% versus 1.4%); legumes (39.9% versus 48.0%) consumption of fish and/or seafood (7.8% versus 8.2%), and consumption of nuts (22.8% versus 28.8%). There were no significant statistical differences between both periods except in three items only: the red meat, butter, and wine. These data were closely similar to those reported by (Sánchez-Sánchez et al., 2020).

In a study performed on Croatian medical students, one third of students reported weight loss during the lockdown and 19% reported weight gain (Dragun et al., 2020). On the other hand, data from Kuwait showed that there was a significant increase in the weight of respondents in the time of confinement (AlMughamis, AlAsfour, & Mehmood, 2020). In the current study, the majority of students among all sample groups reported no change in weight during the confinement period.

In Spain, the COVID-19 confinement resulted in better adoption of healthier dietary habits in the studied population with higher adherence to MD diet (Rodríguez-Pérez et al., 2020). Whereas in United Arab Emirates, the dietary habits among the adult participants were uncompliant with healthy patterns (Cheikh Ismail et al., 2020).

Among the Croatian medical students, there was no difference in dietary pattern between pre-lockdown and during the lockdown periods (Dragun et al., 2020). However, in the present study results, the number of students better adhering to the Mediterranean diet increased in both the undergraduate and postgraduate sample groups during confinement to 38.7% and 38.2% respectively but remained the same among professionals. Thus, resulting in overall increased adherence in physical therapists to healthy dietary habits. These results can be contributed to the Lebanese government restrictions which exempted healthcare professionals from home confinement while students were introduced to the online learning technology. Therefore, professional physical therapists were not similarly confined as the undergraduate and postgraduate students.

Since quarantine has disturbed the daily routine of the general Lebanese population, and forced precautionary measures on sport related facilities, prohibiting the practice of outdoors running and walking sports, it was expected that physical therapists in particular to be more alert to the regression in their physical activity and aware to its impact on their career demand. Although weekly physical activity and weekly sitting time may increase during the lockdown, others (C. Romero-Blanco et al., 2020) reported that the COVID-19 pandemic had a negative impact on various levels of physical activity (walking, moderate, vigorous, and overall) and increased daily sedentary time (Ammar et al., 2020).

When comparing this study results of the physical activity engagement before and during confinement, the most significant increase in physical exercise practice was among the professional sample group from 47.5% to 70.0%, while the other two groups showed a mild increase only. Simultaneously, there was a decrease in the number of professionals who did not practice physical exercises during the confinement to 17.5% while the other two groups recorded an increase in this sedentary behavior. Similarly, the professional sample group noted an increase in the time spent doing physical activity unlike the remaining sample groups which reflected increase in the absence of physical exercise time. Although the change before and during the confinement was significant, the results did not reflect a satisfying performance of the recommended amount or time of physical activity.

Surprisingly, after analyzing the IPAQ-SF questionnaire results which assessed the physical activity during the previous seven days during confinement period, the professional's group demonstrated the highest percentage of low physical activity while the undergraduate group was the most highly active. With home workout being the only possibility to play sports and staying active during COVID-19 pandemic, the current findings of the undergraduate and postgraduate students seem compliant to the forced ongoing situation as reported by another study in China showing 52.3% of college students had inadequate physical activity during COVID-19 outbreak (Xiang et al., 2020). In a systematic review of a total of 10 studies; walking, moderate, vigorous, and total physical activity levels were reduced during the confinements in university students of different countries (Lopez-Valenciano, Suarez-Iglesias, Sanchez-Lastra, & Ayan, 2020).

It should not be neglected as well that the growing and urging promotion of teleworking and distance education are attached to the increase in time sitting (Sanchez-Sanchez et al., 2020). However, the improvement in the physical activity of the professionals can be linked with their grant of mobility and spending time and providing physical rehabilitation for patients. Recommendations of exercise for professionals to stay physically and mentally fit to carry out the critical role they are providing to the community is a proven way of doing this. The positive impact of regular exercise on mental health is increasingly evident too (Grasdalsmoen, Eriksen, Lonning, & Sivertsen, 2020). People who tend to exercise feel an enormous sense of well-being, more energetic throughout the

day, get more sleep at night, have sharper memories, and feel more positive and relaxed throughout the day. Jogging for 15 minutes a day or walking for 60 minutes reduces the risk of major depression by 26%. This occurs because exercise induces changes in the brain, as neural growth, reduces inflammation, and new activity patterns that promote feelings of calm and well-being.

More than 50% in each sample group during the confinement had normal weight according to their BMI classification. In a study performed on Croatian medical students, one third of students reported weight loss during the thirty days lockdown period and 19% reported weight gain (Dragun et al., 2020) while data from Kuwait showed that there was a significant increase in the weight of respondents during the time of confinement (AlMughamis et al., 2020). In the current study, the majority of the sample groups were familiar with consuming home prepared meals, which was evident as the majority of the participants reported no weight change as well. But this could not contribute to this single variable only. Along with the emerge of COVID-19 pandemic, Lebanon had witnessed one of the most devastating economic crisis in addition to the measures that enormously impacted economy and functioning of society at a large degree. As a result, several lifestyle habits and behaviors of Lebanese citizens were forcefully modified into practical ones, including food resources and supplies. Adding to these factors the decreased physical activity among half of the sample size which plays a significant role in un-boosting the body metabolism and encouraging sedentary effects.

Smoking cessation or refrainment is considered a major health promoting actions a physical therapist can achieve, especially after the COVID 19 pandemic. In an Italian study that assessed the smoking behavior during the confinement period among 1825 participants, the majority of cigarette smokers considered quitting smoking, while one third of former smokers considered smoking again and few never smokers intended to start smoking. In the current results, more than one third of the sample groups were smokers (cigarette or hookah), more than 50% of them reported no change in their smoking frequency during the confinement period, while the only remaining few reported increase or decrease in their smoking habits (Caponnetto et al., 2020).

The American Physical Therapy Association (APTA) has recognized a role for physical therapists in health promotion practice (American Physical Therapy, 2001), and there are indications that physical therapists started to practice this role in their patient management programs (S. Goodgold, 2005; Rea, Hopp Marshak, Neish, & Davis, 2004). This includes but not limited to engaging in regular physical activity, maintaining a healthy weight, refraining from smoking, consuming no alcohol or only moderate amounts, and obtaining daily sufficient sleep. These form the five major key behaviors for health promotion and prevention from chronic diseases identified elsewhere (Liu et al., 2016). There is a growing evidence that health professionals must adopt role model healthy behaviors. Some studies have found that patients seeking physicians with good demonstration of health behaviors as healthy weight and regular exercise practice were more encouraged to change their behaviors and have more confidence in the counseling they received (Frank, Breyan, & Elon, 2000; Hash, Munna, Vogel, & Bason, 2003). Others have also found that health practitioners are more prone to promote healthy behaviors they practice as well (Abramson, Stein, Schaufele, Frates, & Rogan, 2000; Frank, Rothenberg, Lewis, & Belodoff, 2000; Shelley Goodgold, 2005; Livaudais et al., 2005).

As Lebanon has imported the first installment of vaccines in February 2021, there is only few number of people who registered for vaccination. This foreshadows the fact that Lebanon might still need several more months to go back to pre- COVID 19 lifestyle routine. To sum up, it is essential to implement strategies that can help physical therapist students and professionals to utilize the provided resources as online meetings and teleconsultations to improve the daily actions that affect diets and physical activity during the upcoming home confinement or social isolation periods.

## 5. CONCLUSION

Physical therapy students and professionals were significantly affected by the COVID-19 pandemic. As their adherence to healthy diet as the Mediterranean diet increased along with some unhealthy food, their physical activity declined along with increase in the sedentary sitting time activity.

Physical therapists are considered as fitness role models and major influencers in health promotion practice, thus the knowledge of their eating habits and physical activity practice during confinement can be a guide to address the habits that might threaten their utmost fulfillment of their noble profession.

The limitations of the study were lack in the proportionality of the size of sample groups along with the representation of each geographical area. Also, due to COVID-19 restriction, authors were unable to perform an individual-to-individual administered questionnaires and interviews, thus utilizing the available features of the social platforms and online questionnaires, excluding subjects who did not answer completely or with no internet access.

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