

## EFFECT OF THE CONFINEMENT IMPOSED BY COVID-19 ON ALGERIANS PHYSICAL ACTIVITY THROUGH LENS OF GENDER

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### Abstracts

**Background.** To estimate the level of PA before and during quarantine, in both sexes, according to four categories (vigorous, moderate, walking and sitting) and to provide suggestions to reduce the negative effects of the latter (quarantine) on the health of the Algerian population. **Methods.** A sample of 1210 of Algerian males and females, age around 18 to 60 years old have been taken a part in this study: males: 991–81,9 %, females: 219–18,1 %. Interviewed by IPAQ (short form) to estimate the impact of confinement on Algerians gender lifestyle physical activity. **Results.** We confirmed that sitting long hours was the main problem for two sexes. As well as males are more active than females in all comparisons practiced. **Conclusion.** Confinement is a fundamental safety step to avoid the spreading of Covid-19. Whereas some guidelines for avoiding prolongation are requested to reduce inactivity and sedentary lifestyle, especially for our females. Support by health and exercise videos broadcast by national television in order to improve physical activity and routinely exercising in a safe home environment. Support in this study, as an important governmental policy, helps their citizens for healthy living during the corona virus crisis. Admitted as guidelines for our females, permitting them to maintain their physical function and mental health during this critical period.

**Key words:** physical activity level, lifestyle, prevention.

Хуар Абделатіф, Касем Абдельхаді, Зерф Мохамед, Бенгуа Алі. Вплив коронакризи, пов'язаної з covid-19 на фізичну активність алжирців за гендерною ознакою. **Метою дослідження** є оцінка рівня фізичної активності до й під час карантину в чоловіків і жінок за чотирма категоріями (енергійна, помірна, при ходьбі, під час сидіння) та надати пропозиції щодо зменшення негативного впливу коронакризи на здоров'я алжирського населення. **Методи дослідження.** У дослідженні взяли участь 1210 алжирських чоловіків та жінок віком від 18 до 60 років: 991 чоловіків – 81,9 %, 219 жінок – 18,1 %. Для оцінки впливу обмежень, пов'язаних із пандемією, на фізичну активність алжирців використано IPAQ опитувальник, його коротка форма. **Результати дослідження.** Доведено, що довготривале сидіння викликало низку проблем як для чоловіків, так і для жінок, незважаючи на те, що чоловіки є більш активними за всіма видами життєдіяльності. **Висновки.** Соціальне дистанціювання є найдієвішим кроком у забезпеченні уникнення розповсюдження вірусу Covid-19. Тоді як дотримання правил «усамітнення» вимагає зменшення активності та призводить до малорухливого способу життя, особливо алжирських жінок. Тому відеотрансляції на тему здоров'я та занять спортом, що проводяться національним телебаченням, мають на меті покращити фізичну активність та збільшити кількість систематичних фізичних тренувань у безпечних для здоров'я домашніх умовах. Така політика з боку державних органів влади допомагає громадянам Алжиру дотримуватися здорового способу життя під час коронакризи. Такими рекомендаціями керується й жіноча частина населення, що дає їй змогу підтримувати свою фізичну функцію та психічне здоров'я в кризовий період.

**Ключові слова:** рівень фізичної активності, спосіб життя, профілактика захворювань.

Хуари Абделатіф, Касем Абдельхаді, Зерф Мохамед, Бенгуа Алі. Влияние коронакризиса, связанного с Covid-19, на физическую активность алжирцев по гендерному признаку. **Целью исследования** является оценка уровня физической активности до и во время карантина у мужчин и женщин по четырем категориям (энергичная, умеренная, при ходьбе, во время сидения) и предоставит предложения по уменьшению негативного влияния коронакризиса на здоровье алжирского населения. **Методы исследования.** В исследовании приняли участие 1210 алжирских мужчин и женщин в возрасте от 18 до 60 лет: 991 мужчин – 81,9 %, 219 женщин – 18,1 %. Для оценки влияния ограничений, связанных с пандемией на физическую активность алжирцев, был использован IPAQ опросник, его краткая форма. **Результаты исследования.** Доказано, что длительное сидение вызвало ряд проблем как для мужчин, так и для женщин, несмотря на то, что мужчины являются более активными по всем видам жизнедеятельности. **Выводы.** Социальное дистанцирование является самым действенным шагом в обеспечении предотвращения распространения вируса Covid-19, тогда как

соблюдение правил «уединения» требует уменьшения активности и приводит к малоподвижному образу жизни, особенно алжирских женщин. Поэтому трансляция на тему здоровья и занятий спортом, проводимых национальным телевидением, имеют целью улучшить физическую активность и увеличить количество систематических физических тренировок в безопасных для здоровья домашних условиях. Такая политика со стороны государственных органов власти помогает гражданам Алжира придерживаться здорового образа жизни во время коронакризиса. Такими рекомендациями руководствуется и женская часть населения, что позволяет ей поддерживать свою физическую функцию и психическое здоровье в кризисный период.

**Ключевые слова:** уровень физической активности, образ жизни, профилактика заболеваний.

**Introduction.** Coronavirus disease 2019 (COVID-19), formerly known as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and 2019 New Coronavirus (2019-nCoV), was first identified in December 2019 in Wuhan City, China [1]. On 30th January 2020, the WHO declared the Chinese outbreak of COVID-19 to be a Public Health Emergency of International Concern posed a high risk to countries with vulnerable health systems. The emergency committee has stated that the spread of COVID-19 may be interrupted by early detection, isolation, prompt treatment, and the implementation of a robust system to trace contacts [2].

The first ten cases have been described in Africa (Egypt, Algeria, Nigeria, Morocco and Senegal), the spread on the African continent is an important alarm for several explanations. Densely, large and a populated areas and cantons with high poverty and a high migration are the most susceptible peoples for airborne infections and pandemics [3].

On 25 February 2020, Algeria confirmed its first case of SARS CoV-2, an Italian man who arrived on 17 February; on 28 February, Algeria deported him back to Italy, via a special flight from the Hassi Messaoud airport where he was subject to quarantine. On 2<sup>nd</sup> March, Algeria confirmed two new human cases of SARS-CoV-2. On 3<sup>rd</sup> March, Algeria stated another two cases of SARS-CoV-2, which brought the total number of confirmed cases to five. The declarations revealed that the two new cases of COVID-19 are from the same family, and were living in France, adding that there's an exploration to determine the identities of the persons who were in contact with them. The Algerian Ministry of Health declared on the evening of 3<sup>rd</sup> March that three new cases of SARS-CoV-2 had been recorded, bringing the total number of cases to eight. On 4<sup>th</sup> March, 4 new cases of SARS-CoV-2 had been confirmed, from the same family, bringing the total number of cases to 12. On 12<sup>th</sup> March, five new cases of COVID-19, including one death, aged 78 and placed in isolation at Blida hospital. Two cases having stayed in France, one in the Souk-Ahras province, and the other in the Tizi-Ouzou province and three in that of Blida province. The total number of confirmed cases is 26. adding a woman in the state of Skikda having stayed in France was announced, and a second death aged 55 is recorded without the indication of his residence. On 17<sup>th</sup> March, a fifth death was recorded in the Blida Province, he was 51 years old with chronic conditions. On 19<sup>th</sup> March, 10 new confirmed cases of the COVID-19, including two new deaths, to reach a total of 82 confirmed cases including eight deaths [4].

On the other hand, according to the President of the Republic of Algeria, COVID-19 pandemic is an issue of «health safety» and «national security», and the State is completely aware of the sensitive crisis and is concerned with the respect of rights and freedoms as much as it assumes its responsibility in protecting people and property. However, the State cannot alone ward off the spread of the COVID-19 pandemic if people do not satisfy their responsibility to protect themselves and do not conscientiously fulfill with preventive measures and hygiene rules. The State's efforts will remain imperfect, without the discipline, cohesion and understanding of the population, in particular through declaring suspicious human cases to decrease infection and contamination risks (Algeria Press Service, 2020) [4]. While containing the virus as quickly as possible is the urgent public health priority, there have been few public health guidelines for the public as to what people can or should do in terms of maintaining their daily exercise or physical activity routines. Arguably, staying home, as a safe measure, may have unintended negative consequences since such efforts to avoid human-to-human transmission of the virus may lead to reduced physical activity. It is likely that prolonged home stay may lead to increased sedentary behaviors, such as spending excessive amounts of time sitting, reclining, or lying down for screening activities (playing games, watching television, using mobile devices); reducing regular physical activity (hence lower energy expenditure); or engaging in avoidance activities that, consequently, lead to an increased risk for and potential worsening of chronic health conditions [5].

WHO recommends 60 min/day of moderate-to-vigorous physical activity for 6–17-yr-olds, and 75 min/wk of vigorous or 150 min/wk of moderate physical activity for adults and elderly, including 3 and 2 days/wk, respectively, with muscle and bone strengthening. Practical recommendations for staying active

at home, with aerobic exercise training on a bike or rowing ergo meter, bodyweight training, dance and active video gaming, can aid to counteract the detrimental physical and mental side-effects of the COVID-19 protective lifestyle regulations. This commentary provides useful information on home-based physical activity for sedentary people across the lifespan, including children and adolescence, that can be undertaken during the present pandemic or other outbreaks of infectious disease [6].

Therefore, there is a strong health rationale for continuing physical activity at the home to stay healthy and maintain immunity system function in the current precarious environment [7].

It is well known that physical non-activity causes over 5 million deaths worldwide and represents damage for economy of the public health systems, which, for these reasons encourage PA for health promotion and disease prevention [8].

However, due to the government guidelines limitations, we hypothesized that people would practice lower levels of PA during confinement. Support by inactive lifestyle during this period compared to their lifestyle before this virus. Estimated in this study by the validity of International Physical Activity Questionnaire (IPAQ). As standardized instrument used to assess the levels of PA practice in a population, during the «last 7 days» or in the «usual week» [9].

Used in this study by its short-form (IPAQ-SF) estimated from its four intensity levels of PA: (a) vigorous; (b) moderate; (c) walking; (d) sitting [10]. Its data collected admitted by similarities to compute the levels of PA practice in relation to the energy expenditure weekly by using a respective metabolic equivalent task (MET) of each PA type [11].

Aimed in this study through an online adapted version to collected and compared the levels of the four PA categories (Vigorous; Moderate; Walking and Sitting, expressed as (Days/week; min/week; MET values and Hours/day) among the Algerian (males and females) population before and during the last seven days of COVID-19 quarantine.

### **Methodology**

*Design Study.* The present study is a quick, large cross-sectional online survey conducted by using a social Media.

The questionnaire used was the IPAQ short Form version validated in English [10]. The IPAQ short version asks about three specific types of activity undertaken during the previous 7 days in the four domains (leisure time, work, household activities and transport); items are structured to provide separate scores for walking, moderately intense and vigorously intense activities. The IPAQ version also contains a question about the time spent on sedentary activity.

#### *Procedure (Survey or IPA Questionnaire – Short Form)*

The electronic survey was designed and edited by 04 academic Researchers in physical education from different Algerian universities: University of Ghardaïa; University of Ahmed ben yahia el wancharissi Tissemsilt, and University of Abdelhamid ibn badis Mostaganem, following with a structured literature review. The survey was uploaded and shared online on the Google platform. A link to the electronic survey was distributed via a different way: invitation via e-mails, Facebook™, WhatsApp™ and Twitter™.

#### *Sampling*

The online survey was anonymous and not attributable to the identity of the participants. 1210 Algerian participants between (18–60 years old), were included under this study and they were grouped based on their sex: Male: 991; Female: 219.

#### *Statistical Analysis*

This study adopts qualitative and quantitative contents analysis as methodological techniques for interpretation and analysis. All data were analyzed using SPSS 22,0 for Windows Hence, in analyzing the data, these two methodologies are used in an intertwine manner to ascertain how the context of the two sexes response for intensity of physical activity questionnaire recorded before and during home confinement. We used also T-tests to compare between «male and female» recorded (Before home confinement; during home confinement and before and during home confinement). Histograms were used to represent data analysis of these quantitative variables. They are applied to this study because of their compatibility and suitability to this research project. Statistical significance was accepted as  $p < 0,05$ .

**Results and Analysis of Data.** A sample of 1210 participants which comprised 991 males (81,9 %) and 219 females (18,1 %), between (18–60 years old). All the characteristics of the participants are reported in table 1.

Table 2. The table above shows the results of a comparison between male and female following with a pre-containment physical activity index using the t-test. Depending on these results, we can differentiate evidently between the two sexes where the values of statistical significance are below ( $p < 0,05$ ) in the three

levels of intensity (Vigorous; Moderate; Walking and Setting). However, the comparison of the number of days of moderate intensity in the first stage and the number of sitting hours in the second stage did not reveal any significant difference between the two sexes before confinement.

Table 1

**Characteristics of the Participants**

Variable	Sample	n	%	
<b>Participants</b>	Total	1 210	100	
<b>Gender</b>	Male	991	81,9	
	Female	219	18,1	
<b>Age</b>	Years ± SD	18–30yearsold	689	56,94
	30,73± 8,01	31–45yearsold	455	37,60
		46–60yearsold	66	4,95
<b>Family Situation</b>	Unmarried	750	61,98	
	Married	447	36,94	
	Divorced	13	1,07	
<b>Educational Level</b>	There is no	7	0,57	
	Primary Education	2	0,16	
	Basic or Intermediate Education	34	2,80	
	High School	166	31,71	
	University Education	1 001	82,72	
<b>Sports</b>	Athlete	873	72,14	
	Non-athlete	337	27,85	
	Non- patient	992	81,98	

Note: n\_ number; %\_ percentage

Table 2

**Intensity of Physical Activity Questionnaire «Male and Female» Recorded before Home Confinement**

Intensity		Male	Female	T test	P value	Signification
<b>Vigorous</b>	Days/week	2,10±1,93	1,11±1,62	7,83	<0,05	.000
	min/week	36,08±32,09	18,21±24,82	9,10	<0,05	.000
	MET values	869,81±1024,3	721,31±934,2	15,72	<0,05	.000
<b>Moderate</b>	Days/week	1,94±1,80	1,80±1,70	1,01	<0,05	.311
	min/week	34,94±29,55	18,67±28,03	7,77	<0,05	.000
	MET values	389,07±728,15	290,9±312,42	9,43	<0,05	.000
<b>Walking</b>	Days/week	3,99±2,52	3,55±2,32	2,42	<0,05	.016
	min/week	40,11±35,23	34,31±27,78	2,65	<0,05	.008
	MET values	757,86±925,32	457,20±311,64	11,02	<0,05	.000
<b>Setting</b>	Hours/day	2,62±3,40	2,59±1,97	0,14	<0,05	0,88

Table 3

**Intensity of Physical Activity Questionnaire «Male and Female» Recorded before and During Home Confinement**

Male								
Intensity		Before	During	$\Delta$	%	T	P	Sig
1	2	3	4	5	6	7	8	9
<b>Vigorous</b>	<b>Days/week</b>	2,10±1,93	1,45±1,79	0,65	30,95	33,43	<0,05	.000
	<b>min/week</b>	36,08±32,09	23,9±30,91	13,18	36,52	11,5	<0,05	.000
	<b>MET values</b>	869,81±1024,3	397,83±512,17	471,98	54,26	22,32	<0,05	.000
<b>Moderate</b>	<b>Days/week</b>	1,94±1,80	1,58±1,74	0,36	18,56	33,21	<0,05	.000
	<b>min/week</b>	34,94±29,55	26,5±30,81	8,44	24,15	8,52	0,05	.000
	<b>MET values</b>	389,07±728,15	240,33±494,61	148,74	38,22	18,44	<0,05	.000

End of the table 3

1	2	3	4	5	6	7	8	9
Walking	Days/week	3,99±2,52	2,95±2,4	1,04	26,06	13,76	<0,05	.000
	min/week	40,11±35,23	31,08±29,69	9,03	22,51	8,93	<0,05	.000
	MET values	757,86±925,32	344,16±548,27	413,7	54,58	16,73	<0,05	.000
Setting	Hours/day	2,62±3,4	4,2±2,96	-1,58	60,30	13,2	<0,05	.000
<b>Female</b>								
<b>Intensity</b>		<b>Before</b>	<b>During</b>	$\bar{x}$	%	<b>T</b>	<b>P</b>	<b>Sig</b>
Vigorous	Days/week	1,11±1,62	0,90±1,75	0,21	18,91	9,73	<0,05	.000
	min/week	18,21±24,82	11,43±20,51	6,78	37,23	4,88	<0,05	.000
	MET values	721,31±934,2	340,57±322,01	380,80	52,79	8,56	<0,05	.000
Moderate	Days/week	1,80±1,70	0,89±1,61	0,91	50,55	15,20	<0,05	.000
	min/week	18,67±28,03	12,87±21,53	5,8	31,06	3,52	<0,05	.000
	MET values	290,9±312,42	170,65±213,51	120,25	41,33	13,20	<0,05	.000
Walking	Days/week	3,55±2,32	1,04±1,81	2,51	70,70	22,42	<0,05	.000
	min/week	34,31±27,78	12,64±20,71	21,67	63,15	10,75	0,05	.000
	MET values	457,20±311,64	201,20±320,54	256,00	55,99	9,85	<0,05	.000
Setting	Hours/day	2,59±1,97	4,20±2,91	1,61	62,16	9,91	<0,05	.000

Table 3. Those results show the significant difference between pre-confinement and during confinement following the qualifier: physical activity in both sexes in different intensities (Days/week; min/week; MET values and Hours/day) by using the t-test ( $p < 0,05$ ), and the difference of the averages, where we notice a decrease in the level of physical activity during the confinement period in both sexes with percentages close to and equal to 50 % compared to the physical activity of the pre-confinement.

Table 4

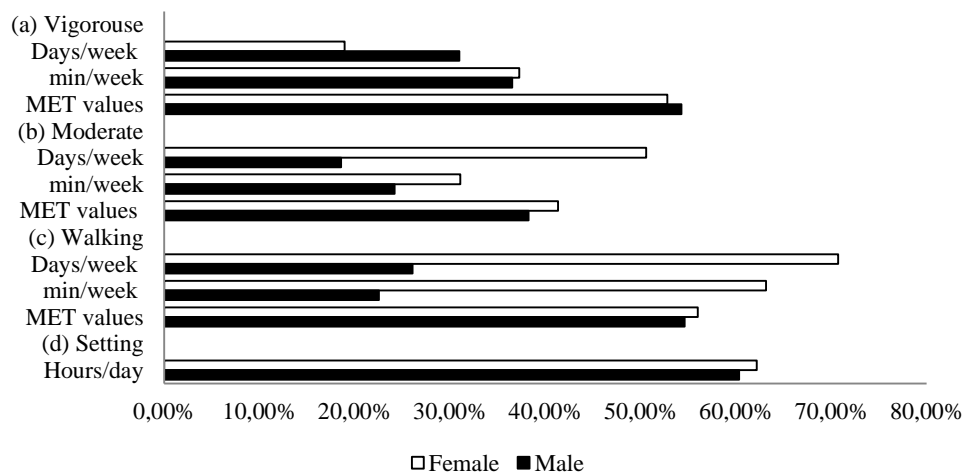
**Intensity of Physical Activity Questionnaire «Male and Female» Recorded during Home Confinement**

Intensity		Male	Female	T Test	P Value	Significa-tion
Vigorous	Days/week	1,45±1,79	0,90±1,75	4,16	<0,05	.000
	min/week	23,90±30,91	11,43±20,51	7,33	<0,05	.000
	MET values	397,83±512,17	340,57±322,01	16,31	<0,05	.000
Moderate	Days/week	1,58±1,74	0,89±1,61	5,64	<0,05	.000
	min/week	26,50±30,81	12,87±21,53	7,77	<0,05	.000
	MET values	240,33±494,61	170,65±213,51	14,52	<0,05	.000
Walking	Days/week	2,95±2,40	1,04±1,81	13,19	<0,05	.000
	min/week	31,08±29,69	12,64±20,71	10,92	<0,05	.000
	MET values	344,16±548,27	201,20±320,54	9,46	<0,05	.000
Setting	Hours/day	4,20±2,96	4,20±2,96	0,034	<0,05	0,97

Table 4. The results of the comparison of the two sexes, using the t-test, affirm those shown in table 04 where we obtained significant differences between women and men in physical activity in the three levels of intensity, where the significance values were less than ( $p < 0,05$ ). This difference was in favor of the male sex being the most active during confinement. This finding was accompanied by the appearance of statistically insignificant differences in the number of hours sitting.

**Discussion.** The objective of the present study was firstly distinguished to inspect the effects of the confinement imposed by Covid-19 on the different PA levels, and secondly to compare between Algerian women and men in their PA levels before and during quarantine. Based on gender all statistical used are significant differences between women and men in the pre-test or before confinement, where men appeared to be more active compared to our females, except in the number of days/weeks of the moderate PA level

additional to daily hourly seating. This case is explained by our socio-cultural aspect in which the most of Algerian women stay at home, after their external obligations (working or standing). Advocated in this study by the different PA levels and the number of days/weeks practice, which was less than 5 days/week recommended by international values and guidelines support. Admitted by pre-confinement PA values, which are close to the values sited by Achraf Ammar et al (2020) estimated from 1047 people in Asia, Africa, and Europe in the different levels [12].



**Fig. 1.** Shows a Comparison before and during the Confinement in Different % Intensity Categories (Vigorous; Moderate; Walking and Sitting), Expressed as (Days/Week; Min/Week; MET Values and Hours/Day) Between Male and Female

Admitted in the two studies by its lower in the period of quarantine, especially when we compared it with the international recommendations that commend 150 to 300 min/ PA week moderated intensity [13], accompanied with 2 resistance sessions per week [14]. Practiced in the case of our samples above 111 min/week of moderated intensity for men additional to 2,10 days/week of vigorous intensity, compared to 71,19 min/week of moderated intensity with the average of 1.11 days/week of vigorous intensity apply by our females. While their comparisons with Achraf Ammar et al (2020) accepted their adequate with PA volume not intensity of efforts (vigorous or moderate) for our two sex [12], in the two preoids, according to the results presented in Table N°03. Claimed in this study as healthy guidelines requesting from our government will politically embody these values in our society.

Advocated by the scientists in this area under rural health social sport projects estimated to promote the recommended PA [15; 6; 16; 17], such as E-Health and video sport technologies as benefits PA interventions able to more individualized behavior change interventions and improving psycho-physiological functions across life or in this period [18; 19] using at least 30 min of moderate intensity PA or vigorous intensity [20; 7]. Claim in the case of Algerian by TV programs broadcast by national television in order to improve physical activity and routinely exercising in a safe home environment, not only in confinement period but also before confinement for both sexes. Recommended for our both sexes under vigorous PA or moderated WHO-recommended PA levels [21; 22].

Support by this study through intensity of load not volume work. Admitted in the case of our sample to be accumulated, at least two-and-a-half hours of moderate-intensity exercise per week, or one-and-a-quarter hours of vigorous activity per week to be done at work or home on most days of the week [23; 24; 25]. Documented by American College of Sports Medicine and the American Heart Association to promote and to maintain health of all aged [26; 27; 28; 29; 30; 31; 32; 33; 34; 23].

Recommended in this study for our citizens as national policy guidelines to improve quality of all life conditions. Estimated in this study as Algerian government policy guidelines establishing on dynamic and innovative culture which promote and award perfection and engagement in physical daily activities, ensuring for all citizens as regular physical activity habits within the approach of «sports for everyone».

**Limitations and Scope of the Study.** This study is intended to examine the event (Covid-19), and use of the IPAQ-SF in collecting information due to the shortness of its questions and clarity in the presentation, which contributed to collect a large number of answers from Algerian people depending on their sex (males and females).

In fact, due to the quarantine, the online survey is an ideal research instrument, as it allowed us to recruit a large sample. Among the strengths of the online survey, we highlight the possibility of reaching the population belonging to different geographical areas and, moreover, the speed in collecting data.

Despite the strengths of our study, that did not prevent it from having limits, especially when it comes to the honesty of the respondent, the latter is unknown for researchers, in addition to the weak percentage of female answers by (18,1 %) compared to males (81,9 %). Nevertheless, our outcomes are in agreement with the literature.

**Conclusions.** Through the results of our study, we can determine that the current quarantine has negatively influenced the practice of PA, especially for our Females.

Support in this study as office guidelines governmental for their citizens during the coronavirus crisis. Support in this study by exercising at home using various home exercises include walking in the house and to the store as necessary, lifting and carrying groceries, alternating leg lunges, stair climbing, stand-to-sit and sit-to-stand using a chair and from the floor, chair squats, and sit-ups and pushups. In addition, traditional Taiji Quan, Qigong exercises, [32], and yoga [33]. Estimated in this study by E-health and exercise videos [34], broadcast by national television in order to improve physical activity and routinely exercising in a safe home environment.

Support in this study as an important governmental policy to help their citizens for healthy living during the coronavirus crisis [23]. Admitted as guidelines for our females permitting them to maintainian their physical function and mental health during this critical period.

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#### Reference

1. Xiao, H., Zhang, Y., Kong, D. (2020). The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019(COVID-19) in January and February 2020 in China. *Med Sci Monit.* Epub ahead of print 2020. DOI: 10.12659/MSM.923549.
2. World Health Organization. WHO Coronavirus Disease (COVID-19). Dashboard. *World Health Organization.*
3. Gilbert, M., Pullano, G., Pinotti, F. (2020). Preparedness and vulnerability of African countries against importations of COVID-19: a modelling study. *Lancet.* Epub ahead of print 2020. DOI: 10.1016/S0140-6736(20)30411-6.
4. Hadjib, M. (2019). Novel Coronavirus Disease 2019 (COVID- 2019). Outbreak in Algeria: A New Challenge for Prevention. *J Comunity Med Heal Care.*
5. Owen, N., Sparling, P. B., Healy, G. N. (2010). Sedentary behavior: Emerging evidence for a new health risk. *Mayo Clinic Proceedings.* Epub ahead of print 2010. DOI: 10.4065/mcp.2010.0444.
6. Hammami, A., Harrabi B., Mohr M. (2020). Physical activity and coronavirus disease 2019 (COVID-19): specific recommendations for home-based physical training. *Managing Sport and Leisure.* Epub ahead of print 2020. DOI: 10.1080/23750472.2020.1757494.
7. Chen, P., Mao L., Nassiss G. (2020). Coronavirus disease (COVID-19): The need to maintain regular physical activity while taking precautions. *Journal of Sport and Health Science.* Epub ahead of print 2020. DOI: 10.1016/j.jshs.2020.02.001.
8. Ding, D., Kolbe-Alexander T., Nguyen B. (2017). The economic burden of physical inactivity: A systematic review and critical appraisal. *British Journal of Sports Medicine.* DOI: 10.1136/bjsports-2016-097385.
9. Craig, C., Marshall, A., Sjostrom, M. (2003). Guidelines for data processing and analysis of the IPAQ-short and long forms. *Med Sci Sport Exerc.* Epub ahead of print 2003. DOI: 10.1249/01.MSS.0000078924.61453.FB.
10. Lee, P. H., Macfarlane, D. J., Lam, T. H. (2011). Validity of the international physical activity questionnaire short form (IPAQ-SF): A systematic review. *International Journal of Behavioral Nutrition and Physical Activity.* Epub ahead of print 2011. DOI: 10.1186/1479-5868-8-115.
11. Ainsworth, B. E., Haskell, W. L., Hermann, S. D. (2011). Compendium of Physical Activities. *Med Sci Sport Exerc.* Epub ahead of print 2011. DOI: 10.1249/mss.0b013e31821ece12.
12. Ammar, A., Brach, M., Trabelsi, K. (2020). Effects of COVID-19 home confinement on eating behaviour and physical activity: Results of the ECLB-COVID19 international online survey. *Nutrients.* Epub ahead of print 2020. DOI: 10.3390/nu12061583.
13. Baradaran, M. S., Kelishadi, R. (2020). Impact of Sedentary Behavior on Bodily Pain While Staying at Home in COVID-19 Epidemic and Potential Preventive Strategies. *Asian J Sports Med.* Epub ahead of print 2020. DOI: 10.5812/asjms.103511.
14. Jiménez-Pavón, D., Carbonell-Baeza, A., Lavie, C. J. (2020). Physical exercise as therapy to fight against the mental and physical consequences of COVID-19 quarantine: Special focus in older people. *Progress in Cardiovascular Diseases.* Epub ahead of print 2020. DOI: 10.1016/j.pcad.2020.03.009.

15. Jurak, G., Morrison, S. A., Leskošek, B. (2020). Physical activity recommendations during the coronavirus disease-2019 virus outbreak. *Journal of Sport and Health Science*. Epub ahead of print 2020. DOI: 10.1016/j.jshs.2020.05.003.
16. Clerkin, K. J., Fried, J. A., Raikhelkar, J. (2020). Coronavirus Disease 2019 (COVID-19) and Cardiovascular Disease Running Title: Clerkin et al.; COVID-19 and Cardiovascular Disease. *Am Hear Assoc*. Epub ahead of print 2020. DOI: 10.1161/CIRCULATIONAHA.120.046941.
17. Andersen, L. B, Riddoch, C., Kriemler, S. (2011). Physical activity and cardiovascular risk factors in children. *British Journal of Sports Medicine*. Epub ahead of print 2011. DOI: 10.1136/bjsports-2011-090333.
18. Mil, A., Sci, H. (2020). Uncorrected Proof The COVID-19 Pandemic: The Role of Body Exercise Dear Editor 2019–2020.
19. Contieri, M., Trucillo, M., Pavese, L. (2020). Can lifestyle have an impact on the incidence of COVID-19 disease? p. 56–59.
20. Piercy, K. L., Troiano, R. P., Ballard, R. M. (2018). The physical activity guidelines for Americans. *JAMA - J Am Med Assoc*. Epub ahead of print 2018. DOI: 10.1001/jama.2018.14854.
21. Agriculture USD of H and HS and USD of 2015 – 2020. Dietary Guidelines for Americans. *2015–2020 Diet Guidel Am (8th Ed)*. Epub ahead of print 2015. DOI: 10.1097/NT.0b013e31826c50af.
22. Giustino, V., Parroco, A. M., Gennaro, A. (2020). Physical activity levels and related energy expenditure during COVID-19 quarantine among the sicilian active population: A cross-sectional online survey study. *Sustain*. Epub ahead of print 2020. DOI: 10.3390/su12114356.
23. Booth, F. W, Gordon, S. E, Carlson, C. J. (2020). Waging war on modern chronic diseases: Primary prevention through exercise biology. *Journal of Applied Physiology*. Epub ahead of print 2000. DOI: 10.1152/jappl.2000.88.2.774.
24. HQ, B. (2019). *Physical Exercise for Brain Health*.
25. Kortebein, P., Ferrando, A., Lombeida, J. (2007). Effect of 10 days of bed rest on skeletal muscle in healthy older adults. *Journal of the American Medical Association*. Epub ahead of print 2007. DOI: 10.1001/jama.297.16.1772-b.
26. Breen, L., Stokes, K. A., Churchward-Venne, T. A. (2013). Two weeks of reduced activity decreases leg lean mass and induces 'anabolic resistance' of myofibrillar protein synthesis in healthy elderly. *J Clin Endocrinol Metab*. Epub ahead of print 2013. DOI: 10.1210/jc.2013-1502.
27. Westerterp, K. R. (2019). Physical activity and body-weight regulation. p. 791–792.
28. Jakicic, J. M., Davis, K. K. (2011). Obesity and physical activity. *Psychiatr Clin North Am*, p. 829–840.
29. Gaesser, G. A, Angadi, S. S, Sawyer, B. J. (2011). Exercise and diet, independent of weight loss, improve cardiometabolic risk profile in overweight and obese individuals. *The Physician and sportsmedicine*. Epub ahead of print 2011. DOI: 10.3810/psm.2011.05.1898.
30. Zhu, W. (2019). If you are physically fit, you will live a longer and healthier life: An interview with Dr. Steven N. Blair. *J Sport Heal Sci*. Epub ahead of print 2019. DOI: 10.1016/j.jshs.2019.09.006.
31. Guo, Y, Qiu, P., Liu, T. (2013). Tai Ji Quan: An overview of its history, health benefits, and cultural value. *Journal of Sport and Health Science*. Epub ahead of print 2014. DOI: 10.1016/j.jshs.2013.10.004.
32. Yoga-what-you-need-to-know. Available at: [www.nccih.nih.gov](http://www.nccih.nih.gov).
33. Tate, D. F., Lyons, E. J., Valle, C. G. (2015). High-tech tools for exercise motivation: Use and role of technologies such as the internet, mobile applications, social media, and video games. *Diabetes Spectrum*. Epub ahead of print 2015. DOI: 10.2337/diaspect.28.1.45.

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