



## **IMPACT OF LOCKDOWN DUE TO COVID-19 OUTBREAK ON MUSCULOSKELETAL HEALTH IN GAZA'S UNIVERSITY STUDENTS. ACROSS-SECTIONAL STUDY**

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<b>Article history:</b>	<b>Abstract:</b>
<p><b>Received:</b> November 6<sup>th</sup> 2021 <b>Accepted:</b> December 6<sup>th</sup> 2021 <b>Published:</b> January 26<sup>th</sup> 2021</p>	<p><b>Background:</b> Coronavirus pandemic disease has reached to around 216 countries, with approximately 11,475,598 currently infected cases and 1,193,912 deaths globally as of October 31, 2020. Because of that many countries have implemented lockdown to slow down the spread of COVID-19 those results in a wide variety of symptoms. This article aimed to evaluate the impacts of lockdown due to COVID-19 on musculoskeletal health among university students in Palestine. This study aims to investigate the relationship between lock-down due to covid19 and other problems such as musculoskeletal problem, sleep quality, joints or muscles symptoms, and overall impact in Gaza's university students.</p> <p><b>Method:</b> In view of the Movement Control Order (MCO) or Lockdown by Palestine authority amid COVID-19, an online survey via Google form was conducted. Three hundred students from different universities and colleges participated in E-survey. The survey was conducted by sending a connection to Google Forms for musculoskeletal health questionnaire through social networking sites using google forum to conduct the effect during the entire lockdown.</p> <p><b>Result:</b> During the period of COVID-19 lockdown, there was a statistically increase in the musculoskeletal symptoms compared to before (<math>P &lt; 0.05</math>), like moderate pain during the day (44%), needing help from others (18.5%), males over females regarding joint or muscles problem during work daily (35%), while, moderate to severe troubles during sleep (37.4%, 23.8%) respectively.</p> <p><b>Conclusion:</b> Students' musculoskeletal wellbeing is affected by the covid19 curfew. Pain, daily activity level, and sleep all display signs of deterioration, according to the report.</p>

**Keywords:** Musculoskeletal symptoms, covid-19 lockdown, university students, physical activity, night sleep troubles

### **1. INTRODUCTION**

Coronavirus (Covid-19) is a global epidemic, it has reached to around 216 countries, with approximately 11,475,598 currently infected cases and 1,193,912 deaths globally as of October 31, 2020. The beginning of 2020 is the infectious year because of the breakout

of this virus which mainly effect on respiratory system and other systems of the body as well<sup>1</sup>.

Global Health Organization (WHO), on January 30th, 2020, the novel corona virus declared public health emergency (19-nCoV).<sup>2</sup> As COVID-19 continues to spread. In many countries in the world including Palestine, government implemented a lockdown to



protect the nation from exposure to infection of COVID-19. This result in increasing the levels of sedentary behaviour, including spending more time on activates to relax, watching TV, reducing routine outdoor activities and workouts contribute to increase of chronic disease and other disorders .<sup>3</sup> A study conducted in Italy documented that lock down caused a different form of sleep disturbances such as increasing in bedtime hour, sleep latency<sup>9,10</sup>.

The Covid19 lockdown has an adverse effect on the level of physical activity, joint function, and physical function in patients with hip and Knee OA<sup>4</sup>. Previous Studies have found that lockdown is attributed with anxiety as shown in Malaysian university students<sup>5</sup>. Another study conducted in India has noticed that the chronic stress of living cause a host of physical symptoms like headache, insomnia, digestive problems, hormonal imbalance, and fatigue because of lockdown <sup>6</sup>. Likewise, in turkey a study has examined the impact of lockdown on MS pain the results documented that low back pain was higher in stay home group during lockdown than in pre-lockdown period among population <sup>7,8</sup>.

Despite the documented burden of lockdown among college students, little attention has been given to, nor, to the best of our knowledge, has any study directly investigated the issue of musculoskeletal health among college students in Palestine. The current study was therefore initiated to investigate the lockdown due to Covid-19 on musculoskeletal health among university students in Palestine.

## **2. Material and Methods**

### **2.1. subjects**

This is an online survey-based study of the 300 undergraduate, postgraduate researchers, and PhD students in different colleges (Al-Azhar university, Islamic university, and Al-Aqsa University) in Gaza strip, Palestine.

### **2.2. Data collection and procedure**

To gather the data, an online survey was conducted from December 2020 to the end of March 2021. Students were sent a connection to a structural questionnaire created with Google Forms through WhatsApp, Facebook, and email. Before taking part in the online survey, participants were given the opportunity to give their full consent. A total of 299 students responded to the survey with complete details.

### **2.3. Sample size and study design**

E-survey was sent to students during the lockdown in period of December 2020 to the end of March 2021. The participated students were from different courses (undergraduate – postgraduate – researchers- and

doctorate students in different colleges). participants who do not have a social media accounts or smartphones were excluded from the study. The E-survey has designed based on musculoskeletal questionnaire which mainly consist of fifteen questions about symptoms, physical activities, daily life activities and sleep. Likewise, demographic related questions related to the form of E-survey like weight, age, gender, health conditions and profession.

Regarding inclusion criteria ;(1) Age between 20-35; (2) Gender include male and female .(3) students of the above mentioned universities ( Al-Azhar university, Islamic university , and Al-Aqsa University) ; (4) knowledge of English language .On contrary , exclusion criteria includes ; (1) history of medication or diseases ;(2) history of injury in preceding 3 months .

### **2.4. Ethical consideration**

The first page of the study's questionnaire, which was written in English and stated the study's goals, was used to get informed consent. The confidentiality of the information was ensured. At any time during the questionnaire, participants could withdraw out. No names were gained through the questionnaire, and all information gathered was used for scientific and educational purposes. we ensured that the study was performed according to the principles laid by, declaration of Helsinki (Revised 2013), Council for International Organizations of Medical Sciences (CIOMS) guidelines, International ethical guidelines for health-related research involving humans (2016) and National guidelines for biomedical and health research involving human participants (2017).

### **2.5. Validation of questionnaires**

approval has been received to utilize musculoskeletal health questionnaire. This was done in close collaboration with the license holder of the MSK-HQ questionnaire by Oxford University Innovation Ltd.( <https://innovation.ox.ac.uk/>). We use the English language original version by using the Google platform to create it available online to students.

Musculoskeletal health questionnaire is the MSK-HQ aims to capture patient and clinician prioritised key outcomes across a spread of musculoskeletal conditions. The instrument consists of 14 items and covers variety of health-related domains, including symptoms, physical functioning, daily activities and work, physical well-being, confidence to manage symptoms, condition understanding and social activities. Each item on the MSK-HQ is answered on a 5-point verbal rating scale (responses coded from 'not at all'=4 to 'extremely'=0, aside from items 12 'understanding condition' and 13 'confidence in managing symptoms', which have the response options within the reverse order). Scores are summed, starting from 0 to 56, where 56 is that the very best



state of musculoskeletal health. The relatively brief format makes the MSK-HQ more suitable to watch and compare musculoskeletal health status across various conditions and throughout the clinical pathway. The first version of the MSK-HQ has demonstrated high completion rates, good test-retest reliability, and powerful convergent validity with reference standards in four different MSK cohorts <sup>11</sup>. The study was executed by sending the online link (<https://docs.google.com/forms/d/e/1FAIpQLSd2F9AA CXMQni2-F4tNGbkBZvWS7IZdjsBf0P9Mx7GyEIC39A/viewform>) to students through social networking such as WhatsApp, Facebook, and email.

### 3.1. Descriptive analysis

The purpose of the study was to find out the correlation between lockdown due to Covid-19 outbreak and musculoskeletal health in students. A sample of 299 participants either universities teaching staff or a student from different colleges (Males – Females) participated in the study. The descriptive data, as well as the socio-demographic and physical features of the participants, are shown in the following tables. (Table 1.1,1.2)

### 3- RESULT

Results showed that, Data was not normally distributed according to Shapiro wilk. hence, this mainly clarifies the intent of using spearman’s test. The purpose of the study is to determine the links between lockdown-due to Covid-19 outbreak and musculoskeletal health of participations.

1.1 **Means and standard deviations**

value	M	SD
Gender	.51	.501
1- Pain /stiffness during day	1.48	1.471
2- Pain /stiffness during night	1.56	1.274
3- Walking symptoms	.47	.828
4- Washing/dressing symptoms	.55	.823
5- Physical activity level	.76	.901
6- Work/daily routine symptoms	.70	.933
7- Social activities / hobbies symptoms	.73	.930
8- Needing help	.43	.717
9- Sleep	1.17	1.102
10- Fatigue or low energy	1.00	.925
11- Emotional well – being	1.22	1.229
12- Understanding the condition and Current treatment	1.54	1.204
13- Confidence in managing symptoms	1.49	1.322
14- Overall impact	1.33	1.135
15- Past week PA	2.52	1.513

**(Data are expressed as mean and S.D.), PA: physical activity**



**Table 1.2 baseline socio-demographic & physical characteristics of program participants**

Frequency (n)	percentage%
<b>Total</b>	
<b>Sex</b>	
Male	110 36.7
Female	189 63.2
<b>Age group</b>	
Median age	25 53.1
20-25	159 46.8
25-30	140
<b>Education</b>	
B.A./B.Sc.	200 66.8
M.A./M.Sc./PhD	99 33
<b>Marital status</b>	
Married	53 17.7
Single	249 82.2
<b>Income of the family (ILS)</b>	
1000-2000	185 61.8
Above 3000	114

**Scio-demographic features of the Gaza’s university students**

By contacting 450 participants, responses were 299 participants, which represents 66.4% of all response rates. we had a small variation with relevant pain during the day. approximately 29.5% of students. Majority of the students exposed to moderate pain during the day, whereas, fairly severe 12.3%. while the pain or stiffness fell into night, it had been significantly noticeable around 44.7% was moderate, 21.9% was very severe. It seems that symptoms failed to exist during walking, 68.5% of students were slightly felt symptoms. while 20.2% of students felt moderate

symptoms. Likewise, daily activities symptoms were not common only 4% of students s had symptoms during the daily activities. With relevance to the physical activity level, it seems that there are some limitations to practice PA. students were feel moderate symptoms around 34.8% and very severe 6.3% respectively. Owing to physical activity days, 24. % of students have done two days of PA, while one day of PA was around 18.5% and 12.6% was three days. (Figure 1)

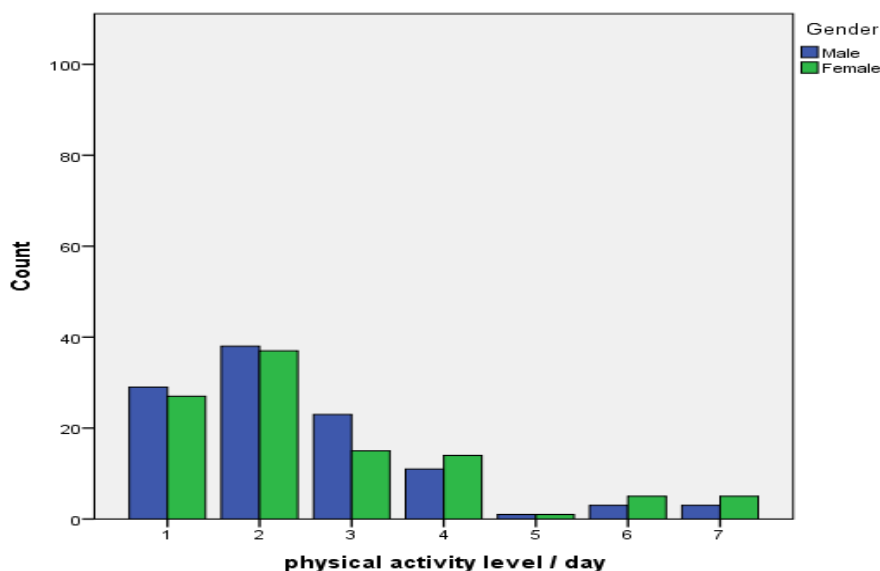


Fig .1: students physical activity level per day and percentage

27.5% of students had joint or muscles problem during work daily routine, and really severe symptoms were 16.6%. it seems that also such reasonable symptom's effect on the social lifetime of students approximately around 35% was moderate, 7% was very severe.

Regarding help, 18.5% of students were needing help from others. while sleep was a serious issue during the lockdown period for most of students, 37.4% of students had moderately troubles during sleep, fairly severe was 23.8% and every night troubles were 7.6%.

Fatigue also was there which mainly 46.4% was moderately, fairly severe 18.2%, and extreme fatigue was 4%. Most university students recognized their conditions well as shown in statistics, 38.8% of them were well understanding

of their conditions, all right understanding was 29.5%, and completely understanding was 5.3%. Most students were not confident enough during managing their symptoms, the best level of responses was slightly response around 29%.

The general impact of symptoms bothering showed that nearly all the students were annoyed during the last period of the study, moderate, very much, and intensely were 28.1%,27.5%, and 9.9% respectively.

From the analysis, key findings emerge that almost all the students had sleep troubles during the lockdown, Males were over females, around 37.4% of students had moderately troubles during the sleep. While 23.8% were fairly severe. (Figure.2)

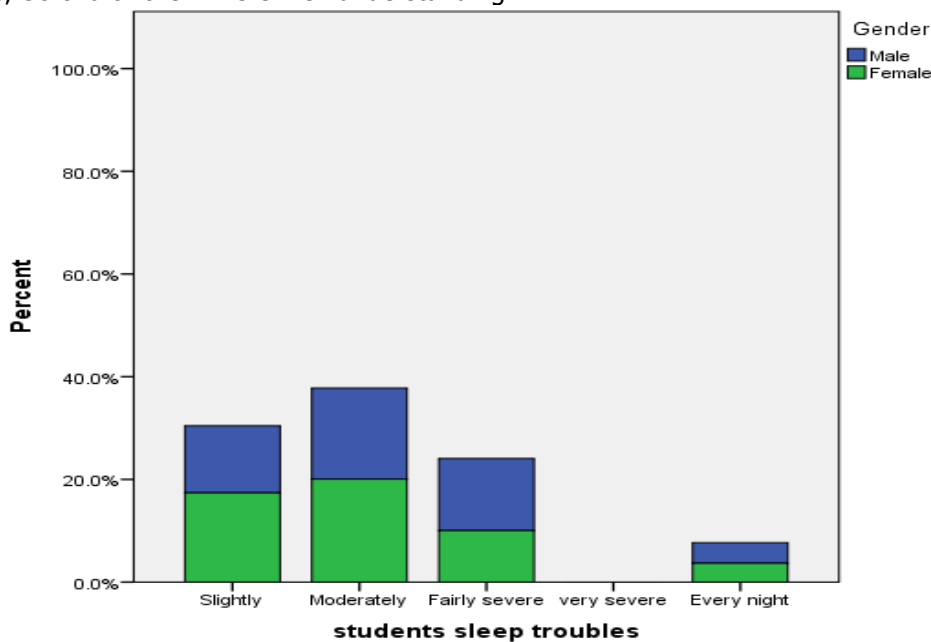


Fig .2: students sleep trouble during the lockdown

Lastly, study findings illustrated that students had musculoskeletal symptoms such as pain in muscles or pain of body joints. Females' symptoms were over

males during the period of Covid-19 lockdown. (Figure.3)

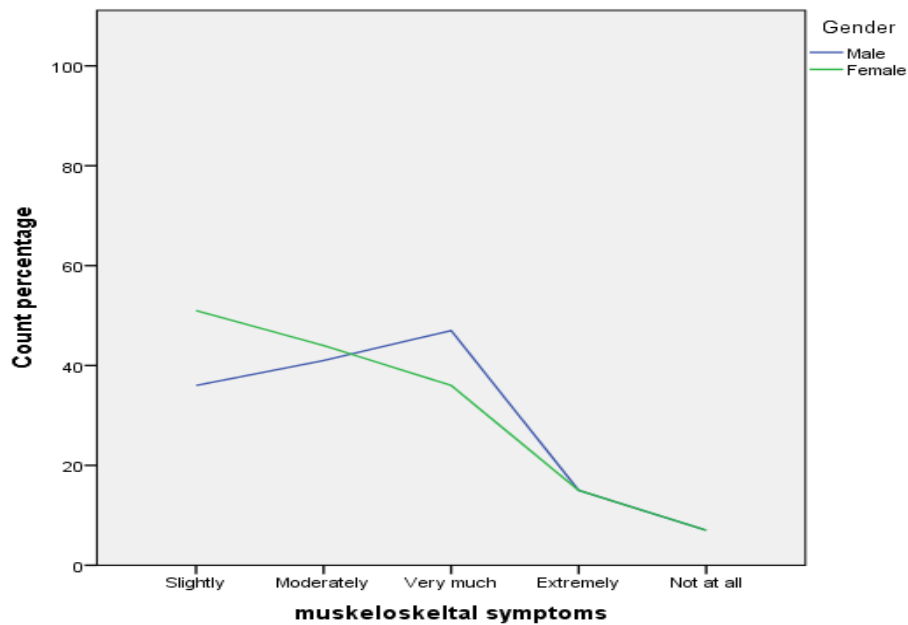


Fig.3: musculoskeletal disorders during lockdown

### 3.2. Correlation:

Data was not normally distributed; this clarifies the intent of using spearman's test. To determine the relationship between lockdown due to Covid-19 and other variables. Spearman's rank correlation coefficient was determined, the result of lockdown due to Covid-19 revealed: A positive significant correlation with work/ daily routine ( $r = .117^*$ ,  $P = .043$ ). whereas, appositive significant correlation with needing help from others ( $r = .140^*$ ,  $p = 0.16$ ). With respect to confidence during managing symptoms, a negative significant correlation ( $r = -.190^{**}$ ,  $p = .001$ ). likewise, overall impact of symptoms, there was a negative significant correlation ( $r = -.154^{**}$ ,  $p = .008$ ). lastly, a negative significant correlation with physical activity levels ( $r = -.260^{**}$ ,  $p = .000$ ). Regarding other variables, there were a weak correlation. Moreover, the entire ( $r$ ) does not exceed mor than .1 value.



1.1 Spearman's rank correlation coefficient

		pain stiffness -- day	pain stiffness - night	walking symptoms	washing dressing symptoms	physical activity level	joint, muscle symptoms - daily routine	joints, muscles symptoms - social activities	Needing help	sleep troubles	Fatigue	Emotional wellbeing	understanding the condition	confidence	overall impact	PA /last 2 weeks
pain stiffness - day	ρ	1.000														
pain stiffness - night	ρ	0.097	1.000													
walking symptoms	ρ	0.015	.148*	1.000												
washing dressing symptoms	ρ	0.053	0.090	.585*	1.000											
physical activity level	ρ	-0.011	.215**	.537*	.552*	1.000										
joint, muscle symptoms - daily routine	ρ	.117*	.225**	.480*	.477*	.535**	1.000									
joints, muscles symptoms - social activities	ρ	0.088	0.033	.356*	.367*	.349**	.473*	1.000								
Needing help	ρ	.140*	0.100	.522*	.521*	.355**	.340*	.270*	1.000							
sleep trouble	ρ	0.023	.162**	.347*	.394*	.445**	.339*	.319*	.242**	1.000						



s																
Fatigue	ρ	-0.095	.124*	.336*	.430*	.502**	.445*	.237*	.292**	.283**	1.000					
Emotional wellbeing	ρ	-0.006	-0.050	.263*	.245*	.324**	.263*	.333*	0.052	.210**	.276**	1.000				
Understanding the condition	ρ	-0.029	.151**	.179*	0.112	.158**	.121*	.180*	.192**	.247**	0.019	0.036	1.000			
Confidence	ρ	-.190**	.229**	.137*	.171*	.249**	.162*	0.101	.152**	0.092	.272**	0.103	.179**	1.000		
Overall impact	ρ	.154**	-0.004	.134*	.182*	.199**	.240*	.258*	0.074	.136*	.136*	.367**	0.036	.127*	1.000	
PA /last 2 weeks	ρ	-.280**	-0.074	0.010	-0.098	-.189**	-0.119	0.076	-0.120	-0.097	-.181**	-0.003	-0.101	-0.092	-0.108	1.000

Correlation is significant at the 0.05 level (2-tailed).

Correlation is significant at the 0.01 level (2-tailed).

#### 4- DISCUSSION

The study conducts over one variable at an identical time. It is mainly focused on musculoskeletal symptoms in numerous body parts specifically joint, back, neck, and muscle symptoms like pain, aches, and stiffness. The musculoskeletal questionnaire is conducting various factors like pain /stiffness during the day and through the night, symptoms during walking, symptoms during certain activities like washing and dressing, physical activity levels, daily routine symptoms, social activities, and hobbies, needing help, sleep, fatigue, emotional wellbeing, recognizing the general condition/problem, confidence, overall impact, and physical activity level during the last week of the present study.

Another study conducted during the lockdown era stated that the utilization of social media increased, in turn, the incidence and severity of musculoskeletal disorders among university students during the Covid-19 lockdown. additionally, between 10 April and 13 April 2020, the info collection during the analysis took 3 days, during which 317 questionnaires were completed using Google forms as a web-based questionnaire. Within the primary page of the research questionnaire, consent was obtained, and it had been entirely written in Arabic, which is that the official

language in Palestine, describing the needs of the study. No names were obtained from the questionnaire and everyone data collected was used for scientific and research purposes. 259 (81.7 percent) of the 300 and seventeen participants were females, and 58 (18.3 percent) were males, therefore the mean age was 20.34 years (SD=2.54). Most participants were 90 (28.4 percent) from the school of Health Professions, and 89 (28.1 percent) were in their first year, 67 (21.1 percent) within the second year, 69 (21.8 percent) within the third year, and 92 (29.0 percent) within the fourth year or more.

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within the third year, and 92 (29.0 percent) within the fourth year or more <sup>(15)</sup>.

Another research in India found that students were more prone than others to stress, anxiety, and depression. A total of 403 respondents completed their survey. 139 were students out of the total participants. On stress, mean values were found to be 15.57, mainly higher than those such as teachers, academics, and specialists in mental health. compared, the mean value for students was over around 12.63 and the mean value for students' depression was 10.84 <sup>(15)</sup>.

As the research is an online survey, we were able to attain wider reachability and exposure, eco-friendly (papers were not used), cost-effective, minimal time consuming, and able to reply by the participant at the time of their convenience. The findings cannot be claimed to universally be the case for all students. Further improvement is expected to result in an improved understanding impacts of Covid-19 on students.

### 5- Conclusion

In general, during the lockdown time, the physical health of the students is affected by the lockdown. The feasibility of the findings of the study suggests that the standard of sleep, and musculoskeletal symptoms have been drastically decreased. Even though, one day or three days of physical activity were not enough to mitigate the symptom concerns during the lockdown of Covid-19.

**Acknowledgment:** The authors gratefully thank all students who are participated in the study from medical college, health medical sciences, and other disciplines of Al-Azhar university, an Islamic university, and Al-Aqsa University.

**Data Availability statement:** data will be made available on demand.

**Author Contributions:** All authors met the ICMJE criteria for authorship. All authors contributed equally to the subsequent preparation of the manuscript. Conceived and designed the study: OS, MO; Wrote the initial draft: MO; analysis: MO, critically reviewed the manuscript: OS, MO. Prior to submission, all authors reviewed and accepted the final version of the manuscript.

### Declarations

**Ethical clearance:** Palestinian ministry of health, research ethics board.

**Consent to participate:** Prior to enrollment, all participants provided both oral and written permission

and they were informed of their right to withdraw from the research at any time.

**Consent for publication:** Not applicable

**Funding:** This study received no funding.

### Conflicts of Interest:

The authors declare no conflict of interest.

**Code availability:** Stata code will be available if requested.

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