Impact of lockdown on musculoskeletal health due to COVID-19 outbreak in Bangladesh: A cross sectional survey study

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ABSTRACT

Background: During the nationwide lockdown implemented by the government of Bangladesh due to the coronavirus, has led to the various changes in the overall activities and lifestyle. Most of the people began living a sedentary lifestyle, spending more time on their phone, watching television and excessive sleeping. Reduction of physical activity level had profoundly negative impact on musculoskeletal health.

Aim: This study aims to investigate the impact of lockdown on musculoskeletal health, association between leisure and musculoskeletal pain during this period.

Methods: A cross sectional study was conducted among general populations living in a specific area of Bangladesh by simple random sampling methods. A total of 230 participants both male (182) and female (48) age group between 18-60 years have participated. The study was carried out by sending the Google Form link containing demographic questionnaire, numeric pain rating scale and Nordic musculoskeletal Questionnaire. Wilcoxon sign rank t and Chi squire test was used to analyze the data.

Results: The mean height, weight and BMI of the participants were 164.17 ± 8.40 cm, 63.82 ± 10.70 kg and 23.74 ± 3.97 kg/m² respectively. There was significant increase in time spent in watching television (p = < 0.0001), using smartphone (p = < 0.0001) and sleeping (p = < 0.0001) during the lockdown period. 33.9% participants had pain before the lockdown which increased by 57% during the lockdown periods. There was a significant association between pain intensity and sleeping time (X² = 54.84; p = < 0.0001), time spent watching television (X² = 83.70; < 0.0001), time spent on smartphone (X² = 58.39; < 0.0001) during the lockdown period.

Conclusion: The result of this study concluded that the lockdown has negatively impacted the musculoskeletal health of the participants. The musculoskeletal pain might be short term initially, but can develop to be a long-term problem and burden if proper measures are not taken.

1. Introduction

The coronavirus disease was first identified in the city of Wuhan, Hubei State in China on 31st of December 2019, [1] and has affected more than 213 countries around the world [2]. The causative agent was identified on 7th January 2020 and named as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) by the Chinese Centre for Disease Control and Prevention. The World Health Organization named the disease COVID-19 and declared the outbreak as global emergency on 30th January due to the virulence and highly interactivity [3].

The first confirmed case of COVID-19 in Bangladesh was detected on the 8th of March 2020 by the Institute of Epidemiology, Disease Control and Research (IEDCR). Since then, the virus has spread day by day affecting the whole nation and is still increasing on a daily basis [4]. At first the government of Bangladesh declared the implementation of lockdown for 10 days effective from 26th March to 4th April 2020, later the government declared postponements of the countrywide lockdown extended up to 30 May [5].

During the lockdown, regular outdoor activities were limited, affecting the daily routine of the individuals [6]. Staying at home restricted the athletes to perform physical activity leading to

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development of sedentary habits. Home based fitness activities remained the only solution for being active and helped to maintain exercise routine and fitness during the pandemic [7]. A recent study reported that during lockdown period there was markedly reduced physical activity and energy expenditure level [8]. Long term detraining leads to marked reduction in maximal oxygen consumption, decreased endurance and loss of muscle mass and strength leads to increased risk of injuries. Physical workout denotes a good strategy to preserve function, decrease pain and fatigue, increase joint flexibility and muscle strength [9].

Due to COVID-19, both healthy individuals and patients all around the world have suddenly become inactive which lead to development of several kinds of disease [10, 11, 12]. Di Stefano V et al. reported there was a significant decrease in physical activity and quality of life in patients with neuromuscular disease [13]. The onset of any pain is associated with several factors, including poor posture, performing repetitive movements, heavy lifting and sedentary lifestyle [14]. In addition, few factors can also aggravate pain intensity including reduction of physical activity level which may have a negative impact on psychological well-being [15] and proportional to the increasing level of stress and anxiety [16, 17]. Quarantine measures have a negative impact on human activity level which may have a negative impact on psychological factors can also aggravate pain intensity including reduction of physical activity which is associated with high risk of musculoskeletal pain [18]. Few recent studies investigate the impact of lockdown on physical and/or intellectual disability [19], low back pain [18], hip and knee osteoarthritis [20], and physical activity and psychological well-being in people with chronic pain [21]. But there is scarcity of literature regarding the various effects of the nationwide lockdown on the overall musculoskeletal health in Bangladesh.

So, in this current situation, due to lockdown most of the people are living a sedentary lifestyle [22], spending more time on their phone, watching television and excessive sleeping [23] leading to decreased physical activity which is associated with high risk of musculoskeletal pain [21]. Physical activity and well-being outcome were associated with each other, as significant difference were observed between physical activity level and well-being status [24]. This present study aims to investigate the impact of lockdown on musculoskeletal health and association between leisure activities (time spent on smartphone, watching television and sleeping) and musculoskeletal pain. We hypothesized that there was significant difference in musculoskeletal pain before and during the lockdown period.

2. Methodology

2.1. Ethical statement

Ethical clearance has been obtained from the ethical review board of Mount Adora Hospital, Akhania, Sylhet with the reference number of MAH/ERB-20/03. The study was performed according to the guideline laid by, declaration of Helsinki (Revised 2013) and Bangladesh medical research council guideline 2014. The nature and purpose of the study was informed; followed by informed consent obtained was obtained from the participants through a digital form. The study design, data collection, presentation and citation of this study comply with the standard Committee on publication Ethics (COPE) guideline.

2.2. Subject and procedure

This cross-sectional study was conducted among general population staying in specific area of Bangladesh between the 24th of April and the 25th of May 2020. The required sample was recruited by simple random sampling method. Sampling population was made by listing 1000 individuals, which was selected from the Facebook friend list of the listed four authors based on their current location who were residing in Sylhet division in Bangladesh. From the selected 1000 individuals A sampling frame of 350 population was made by using a random number generator (an application tool; SPSS 20) which is a computer-based software.

2.3. Subject recruitment criteria

Participants, both male and female were recruited for this cross-sectional survey study. The criteria for selecting participants in this study were age group between 18-60 years, residing in Sylhet division, having smartphone or device by which questionnaire can be filled, and willing to participate in this study. The exclusion criteria were: participants who were not willing to spend time to fill-up the questionnaire and who did not have an account on social media such as Facebook and WhatsApp, were excluded from this study.

2.4. Sample size estimation

The required sample size was estimated by using the formula for estimating proportion: \( n = Z^2 \times P \times (1-P)/d^2 \), where \( Z = 1.96 \); \( P = 82\% \); as the response rate of the online survey is \( >80\% \) [25], and \( d = 5\% \). The minimum number of participants required for this study was estimated to be 230. Google forms prevented incomplete or partial submission thus we did not require anticipation of 10\% incomplete forms. When the survey response hit 230 and above, the survey link was closed for accepting further responses.

2.5. Survey development

A series of structured questionnaire (Supplementary file 1) were carried out in this survey containing 1. Demographic data (age group, gender, weight, height, and profession) 2. Coping strategies taken for COVID-19 outbreak, 3. Physical activity before and during the outbreak, 4. Leisure activity before and during the outbreak including; sleeping time, time spent watching television, time spent using mobile phone, 5. History of pain before and during the outbreak and last section containing Nordic musculoskeletal questionnaire to find out the area of pain in the body.

2.5.1. Nordic musculoskeletal disorder questionnaire

Nordic musculoskeletal disorder questionnaire is a valid and reliable tool for assessment of various musculoskeletal disorder present in our body. The questionnaire contains nine symptoms site including neck, shoulder, upper back, elbow, low back, wrist/hands, hips/thighs knees and ankles/feet. Participants were asked whether they had any musculoskeletal issues in their body within the last one week which has affected them to perform their daily activities [26].

2.5.2. Numeric pain rating scale

The numeric pain rating scale is a subjective measure to assess individual’s pain. The scale is composed of 11-point numerical scale ranging from 0 (no pain at all) to 10 (worst imaginable pain). The scale was shown high test-retest reliability (\( r = 0.96 \)) and validity (\( r = 0.86–0.95 \)) [27].

2.6. Survey validation

The initial draft of the survey questionnaire was submitted to a panel of expertise (two professor of physiotherapy, an epidemiologist and an assistant professor of neurology) for content validity. The revised questionnaire was tested on a small target population to check whether the question was confusing or unclear. The response time was monitored while testing the questionnaire. It took not more than 20 min to complete the questionnaire. Thus, the final draft contains 6 sections and 26 questions.
3.3 Association between pain and leisure activities during lockdown

There was significant association between pain intensity and time spent on sleeping ($X^2 = 54.84; p < 0.0001$), time spent on watching television ($X^2 = 83.70; < 0.0001$), smartphone usage ($X^2 = 58.39; < 0.0001$) and physical activity time ($X^2 = 71.04; < 0.0001$) during the lockdown period.

| Table 2. Leisure activity performed by the participants |
|---------------------------------------------------------|
| Leisure activity | Number of participants | Percentage |
|-------------------|------------------------|------------|
| Performing Yoga at home during lockdown | 73 (31.7%) | |
| Performing Breathing exercise at home during lockdown | 94 (40.9%) | |
| Maintaining social distance | 169 (73.5%) | |
| Going out for an emergency | 146 (63.5%) | |
| Going out once a day | 22 (9.6%) | |
| I am always going out | 3 (1.3%) | |
| I am not going out of the house | 59 (25.7%) | |

3.4 Causes and area of pain in the body

More than half of the participants (56.1%) complained about pain in their body during past 7 days. The most common reasons of pain displayed by the participants were spending more time on mobile phone, sitting all day, excessive sleeping and inactivity. Most of the participants complained mainly of lower back pain, followed by neck pain and upper back pain. The causative factor and area of pain during lockdown period are presented in Table 3.

4. Discussion

This online cross-sectional study was conducted among general populations who were residing in a specific area of Bangladesh. We conducted the web-based survey as it was easy to implement and required less time for gathering information. A total of 230 potential participants both male and female participated in this survey study. The study accepted alternative hypothesis as there is significant difference ($p < 0.0001$) in pain before and during lockdown period.

The study findings revealed that 40.9% of participants performed breathing exercise and 31.7% of the participants performed Yoga at home during the lockdown periods as advised by The World Health Organization (WHO). 73.5% participants who went out for their emergency needs maintained social distancing. During the lockdown period, working hours of the participants were significantly reduced ($p < .0001$). At the same time leisure activity such as watching television ($p = .0001$), smartphone usage ($p = .0001$) and sleeping time ($p = .0001$) were significantly increased during the lockdown period. There was no significant change in physical exercise level ($p = .774$) before and during lockdown period. The presence of pain in the body has significantly increased ($p < .0001$) among the study participants during lockdown period as compared to before the time of lockdown. Statistically significant association were noted in pain intensity with sleep time ($p = .0001$), watching television ($p = .0001$), and mobile phone usage ($p = .0001$).

The most common causes of pain during the lockdown period represented by the participants were spending more time on mobile phone (17.5%), sitting all the day (16.6%), disruption of daily activity (13.4%), inactivity (11.8%) and excessive sleep (11.1%). The most common pain site in the body were lower back (24.8%), followed by neck (19.1%) and upper back (14.1%) as shown in Table 3.
Previous studies were conducted to examine the impact of lockdown on pain, physical activity and psychological well-being in individuals with chronic pain. In this study they investigated how lockdown impacted individuals with chronic pain in United Kingdom. The study results indicated that the perception of pain was increased during the lockdown periods [21]. In another study, the negative impact of lockdown on pain and physical function in patients with hip and knee osteoarthritis (OA) was observed. This study recruited 63 patients with hip and knee OA who had been scheduled for surgery that was postponed. The result of the study showed significant impact on pain, physical function, joint function and physical activity in patient with hip and knee OA [20]. The findings of those studies were similar to the findings of this present study as the pain intensity of the general populations were significantly increased (p < 0.0001) during the lockdown periods which is a growing concern for the health care providers.

During the lockdown periods, people of Bangladesh were physically inactive and reported >8 h per day of sedentary behaviors [28]. In another study, during the lockdown period participants declined to participate in physical activity and observed an increased in sedentary behavior and sleep time [29]. Physical inactivity and sedentary behavior were also observed among children living in United states. The study concluded that physical inactivity during COVID-19 may become permanently rooted leading to increased risk of obesity, cardiovascular disease, and diabetes in children [30]. Staying at home for a prolonged period of time lead to sedentary behaviors such as spending more time on phone, watching television, playing games and excessive sleeping [31].

| Variables (n)               | Before lockdown (n%) | During lockdown (n%) | Z value | P value |
|-----------------------------|----------------------|----------------------|---------|---------|
| Sleep time (n = 230)        | 5-6 h                | 79 (34.3)            | 38 (16.5)        | -8.96   | <0.0001 |
|                             | 7-8 h                | 132 (57.4)           | 85 (37)          |         |         |
|                             | 8-9 h                | 18 (7.8)             | 85 (37)          |         |         |
|                             | >9 h                 | 1 (.4)               | 22 (9.6)         |         |         |
| Time spent for watching     | Not at all           | 127 (55.2)           | 90 (39.1)        | -7.34   | <0.0001 |
| television (n = 230)        | <1 h                 | 58 (25.2)            | 54 (23.5)        |         |         |
|                             | 1-2 h                | 38 (16.5)            | 53 (23)          |         |         |
|                             | 3-5 h                | 6 (2.6)              | 22 (9.6)         |         |         |
|                             | >5 h                 | 1 (.4)               | 0 (0)            |         |         |
| Time spent for smartphone   | 1-2 h                | 71 (30.9)            | 21 (9.1)         | -10.53  | <0.0001 |
| use (n = 230)               | 3-4 h                | 108 (47)             | 73 (31.7)        |         |         |
|                             | 5-6 h                | 40 (1704)            | 74 (32.2)        |         |         |
|                             | 7-8 h                | 9 (3.9)              | 38 (16.5)        |         |         |
|                             | >8 h                 | 2 (.9)               | 24 (10.4)        |         |         |
| Time spent for performing   | No activity          | 83 (36.1)            | 83 (36.1)        | -0.29   | .774    |
| physical activity (n = 230) | <20 min              | 66 (28.7)            | 66 (28.7)        |         |         |
|                             | 20-30 min            | 44 (19.1)            | 43 (18.7)        |         |         |
|                             | 30-40 min            | 16 (7)               | 23 (10)          |         |         |
|                             | >40 min              | 21 (9.1)             | 15 (6.5)         |         |         |

Table 2. Leisure activity performed before and during lockdown.

| Variables                  | Causes of pain                                      | Responses (n & %) | Percent of cases |
|----------------------------|-----------------------------------------------------|-------------------|------------------|
|                            | Not because with my routine work                    | 28 (8.9)          | 22.2%            |
|                            | Because of my too much routine work                 | 10 (3.2)          | 7.9%             |
|                            | Because of my inactivity                            | 37 (11.8)         | 29.4%            |
|                            | I am spending more time on watching television before| 13 (4.1)          | 10.3%            |
|                            | I am spending more time on mobile phone before      | 55 (17.5)         | 43.7%            |
|                            | Because of my daily life is totally disrupted       | 42 (13.4)         | 3.3%             |
|                            | Because I am doing household work                   | 14 (4.5)          | 11.1%            |
|                            | Due to excessive sleep                              | 35 (11.1)         | 27.8%            |
|                            | Because of sitting all the days                     | 52 (16.6)         | 41.3%            |
|                            | For an uncertain future                             | 15 (6.1)          | 15.1%            |
|                            | Others                                              | 9 (2.9)           | 7.1%             |
| Total                      |                                                      | 314 (100%)        | 249.2%           |

Table 3. Causes of pain and prevalence of pain complaint by the participants during lockdown.

| Variables                  | Painful area during lockdown                        | Responses (n & %) | Percent of cases |
|----------------------------|-----------------------------------------------------|-------------------|------------------|
|                            | Neck                                                | 61 (19.1)         | 48.0%            |
|                            | Upper back                                          | 45 (14.1)         | 35.4%            |
|                            | Shoulder                                            | 28 (8.8)          | 22.0%            |
|                            | Elbow                                               | 16 (5.0)          | 12.6%            |
|                            | Wrist and hand                                      | 30 (9.4)          | 23.6%            |
|                            | Lower back                                          | 79 (24.8)         | 62.2%            |
|                            | Hips and thigh                                      | 21 (6.6)          | 15.5%            |
|                            | Knee                                                | 25 (7.8)          | 19.7%            |
|                            | Ankle and foot                                      | 14 (4.4)          | 11.0%            |
| Total                      |                                                      | 319 (100%)        | 251.2%           |
Our present study observed that time spent watching television (p= < .0001), duration of smartphone usage (p= < .0001) and sleeping time (p= < .0001) were significantly increased during lockdown period. According to our observation, there was no significant change in physical activity level (p = .774) before and during lockdown period that was in line with the objective of the studies reported previously that might be the reason of increased musculoskeletal pain among the study participants.

In this present study the most common causes of pain reported by the participants were, spending more time on smartphone than before (17.5%), disruption of daily activity (13.4%), and physical inactivity (11.8%). Neck pain was associated with spending more time on mobile phone reported by S. Ahmed et al. [32]. Statistical significant relationship was observed between leisure activity and low back pain outcome [33]. Prolonged sitting in awkward posture is associated with low back pain and sciatica [34] due to which there has been an increase in musculoskeletal pain during the lockdown as compared to before the lockdown started.

More than 1 million people have died due to COVID-19, which is a matter of concern to the scientist now a days. COVID-19 is not a pandemic. It is a syndemic reported by Horton R in a recent literature [35]. Due to the syndemic nature of the threat we face today means that a pandemic, It is a syndemic reported by Horton R in a recent literature matter of concern to the scientist now a days. COVID-19 is not a awkward posture is associated with low back pain and sciatica [34]d u et o cording to our observation, there was no signi activity level (p = .774) before and during lockdown period that was in line with the objectives of the studies reported previously that might be the reason of increased musculoskeletal pain among the study participants.

The authors declare no conflict of interest.

Additional information

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