

# Outcome Effects of COVID-19 Lockdown on the Menstrual Cycle

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## ABSTRACT

**BACKGROUND:** The endeavour of this study was to examine the outcome effects of COVID-19 lockdown on the menstrual cycle.

**METHODS:** This was an observational study by the health survey questionnaire. The Google form method of approach adopted for data collection through social media. The sample size was 41 women and the Sampling method was convenient sampling. The study duration was four months.

**RESULTS:** Out of the 41 respondents, 87.8% were from the urban area and the rest 12.2% from the rural area. Most of them were students (87.8%), unmarried (85.4%), and mainly living at college hostels (63.4%). Around 80.5% did not have any children. Most of these respondents didn't have any pre-existing medical condition and were having healthy menstrual health with regular periods in 73.2% of cases with mostly moderate (63.4%) flow for 2-4 days (51.21%) and an average of 25-32 day in between two periods. Total 61% of these respondents suffered from COVID-19 which affected their lifestyle to a certain extent.

**CONCLUSION:** This study provided the data of the 20-45 years women population lifestyle, eating habits and adherence to the subcontinental diet pattern, stress, and mental health during the COVID-19 lockdown. The perception of weight gain was observed in 31.7% of the population, 53.7% responded that there was physical activity, 48.8% responded overall diet is unchanged, 63.4% responded to moderate menstrual flow, 61% responded to COVID-19 negative but 19.5% responded to be positive and have symptoms but did not get tested.

**Keywords:** COVID-19 lockdown, menstrual cycle, amenorrhea, endometriosis, periods

## INTRODUCTION

The COVID-19 pandemic, caused by severe acute respiratory syndrome coronavirus-2 (SARSCoV-2)<sup>[1, 2]</sup>, has caused over 106 million infections and 2.3 million deaths worldwide, as of February 2021, according to the WHO COVID-19 Dashboard.<sup>[3]</sup> The virus itself, as well as the measures taken to reduce its spread, have profoundly affected the lives of the global population. The pandemic has significantly influenced the mental health of

many people within the population, resulting in loneliness, social isolation, financial strain, as well as anxiety and fear of contracting the virus, and uncertainty for the future. Analysis of a national, longitudinal cohort study found that by late April 2020, mental health in the UK had deteriorated compared with before the COVID-19 pandemic.<sup>[4]</sup> A US study in April 2020 found higher rates of psychological distress among adults, compared with 2022.<sup>[5]</sup> In this study, the increase in psychological distress was greatest in women and young people aged 18–48 years. On the other hand, there is theoretically a group who have experienced reduced stress and improved mental well-being for example, those with financial security, those who have spent more time with their families and less time commuting since the outbreak of the pandemic. It is known that periods of stress and psychological distress can affect women's menstrual health. Stressors can activate the hypothalamic-pituitary-gonadal (HPG) axis and can alter the neuro-modulatory cascade that drives gonadotropin-releasing hormone (GnRH) regulation.<sup>[6]</sup> This can result in functional hypothalamic Amenorrhoea (FHA), and chronic anovulation which is not due to an underlying organic cause.<sup>[7, 8]</sup> Behavioural modification such as cognitive behavioural therapy can reverse this amenorrhoea.<sup>[9]</sup> FHA also occurs secondary to excessive exercise, dieting and caloric restriction and disordered eating.<sup>[10, 11]</sup> Psychological distress is not only associated with missed periods but also the worsening of symptoms associated with menstruation and psychosexual health. Dysmenorrhoea has been shown to be associated with high-stress levels<sup>[12]</sup>, emotional instability and depression.<sup>[13]</sup> Pre-menstrual symptoms (PMS) and menorrhagia are also associated with high psychological distress.<sup>[14, 15]</sup> Higher perceived stress is also associated with lower libido in women.<sup>[16]</sup> Sedentary lifestyle along with less consumption of fresh food due to limited access to it during the pandemic and the superimposed stress of the pandemic itself have compromised maintaining a

healthy and varied diet, as well as regular physical activity. All these factors may have an influential effect on maintaining fine menstrual health.<sup>[17]</sup> Finally, lifestyle may be substantially changed due to the containment measures, with the consequent risk of sedentary behaviours, smoking and sleeping habits modification. Such irregularities and increases in such habits may also have a negative impact on the trial health.<sup>[18]</sup> It is further influenced by the complications of the stress associated with the pandemic, such as obesity and sleep disturbances.<sup>[19, 20]</sup> All these listed associated complications make it the need of the moment for a clinical obligation and a study to analyze it.

## MATERIALS AND METHODS

The study design was observational study with study type was health survey questionnaire. The Google form method of approach adopted for data collection through social media. The sample size was 41 women and the Sampling method was convenient sampling. The study duration was four months.

**INCLUSION CRITERIA:** Women of reproductive age (20-45 years).

**EXCLUSION CRITERIA:** Women who became pregnant or delivered a baby during the pandemic; and had amenorrhoea for any reason (i.e. intrauterine system, intrauterine device or implant).

## STUDY PROCEDURE:

A total of 105 women of reproductive age were approached with the proposal of the study through social media such as Facebook and WhatsApp. Out of these, only 62 women agreed to participate in the study. They were then virtually evaluated as per the inclusion and exclusion criteria. Following the evaluation, only 41 women met the criteria; and were further included in the study. Then the aim and the nature of the study were explained to them and the informed consent was taken in writing with promise to safeguard the personal data to be provided by

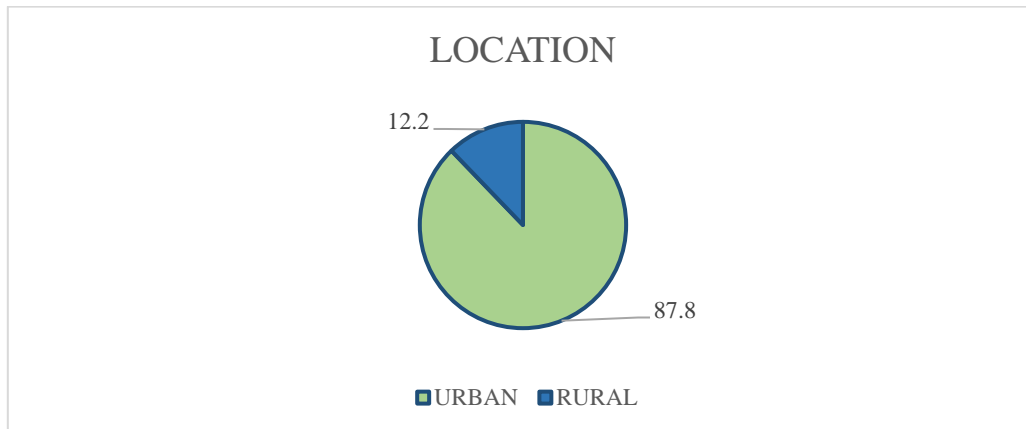
the participants under the study protocol. Then all the participants were asked to fill the questionnaire formed by the surveyor, provided to them through google form. The response to this questionnaire were then recorded in an excel sheet and analyzed.

**DATA ANALYSIS:**

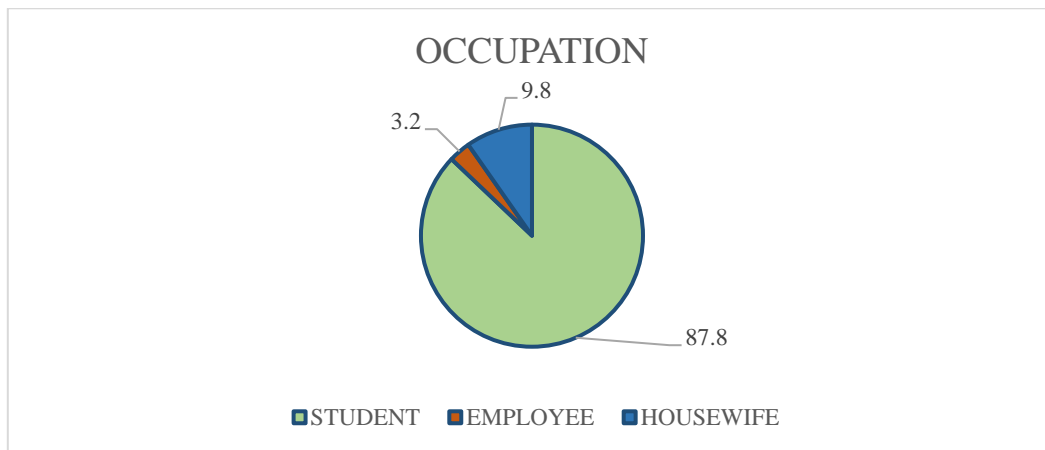
Data were collected in a Microsoft Excel sheet (Version 2019) and were directly analyzed through the google form.

**RESULTS**

Total 41 women completed the survey. The participants were aged between 20 years to 45 years with a mean age of  $22.5 \pm 4.1$  years. They were from different parts of Odisha, India and from different social and economic groups. They responded to 13 questions out of which 11 were objective type and in the rest two they had to mention the value. The responses to each question are described as follows:



**Figure 1: Response to Location**



**Figure 2: Response to Occupation**

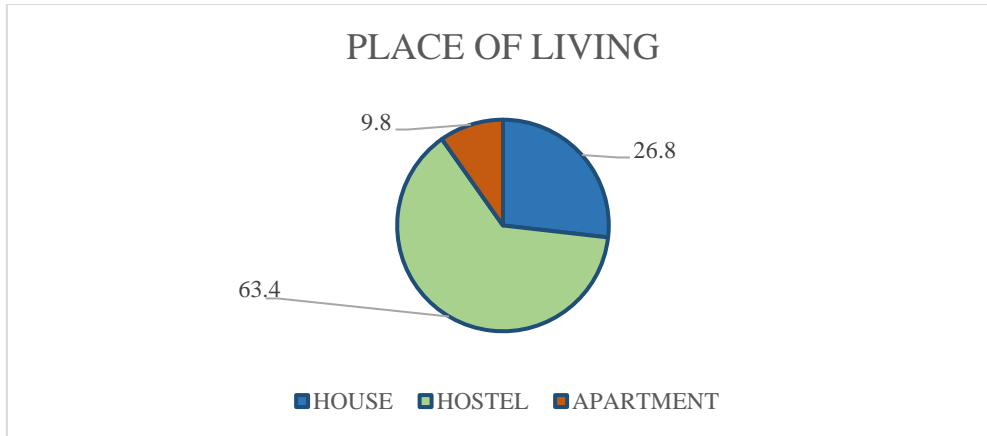


Figure 3: Response to Place of Living

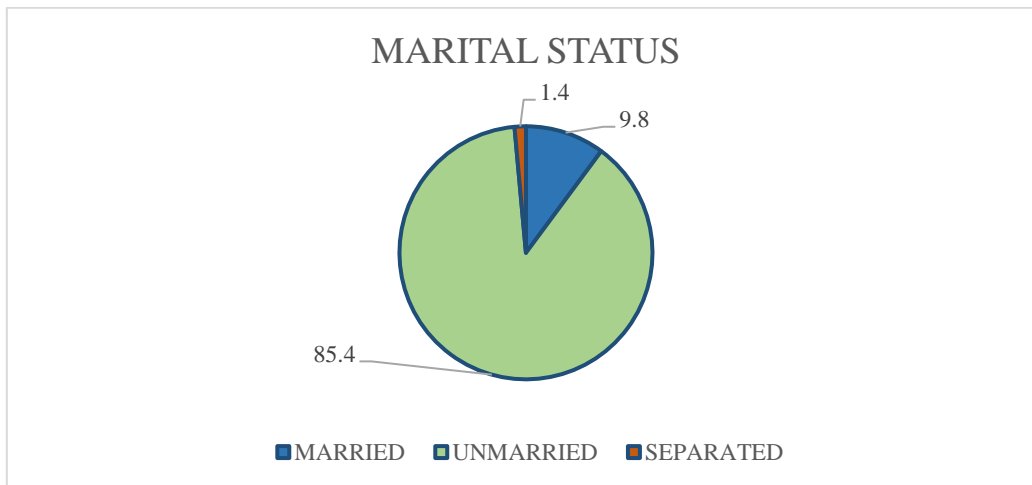


Figure 4: Response to Marital Status

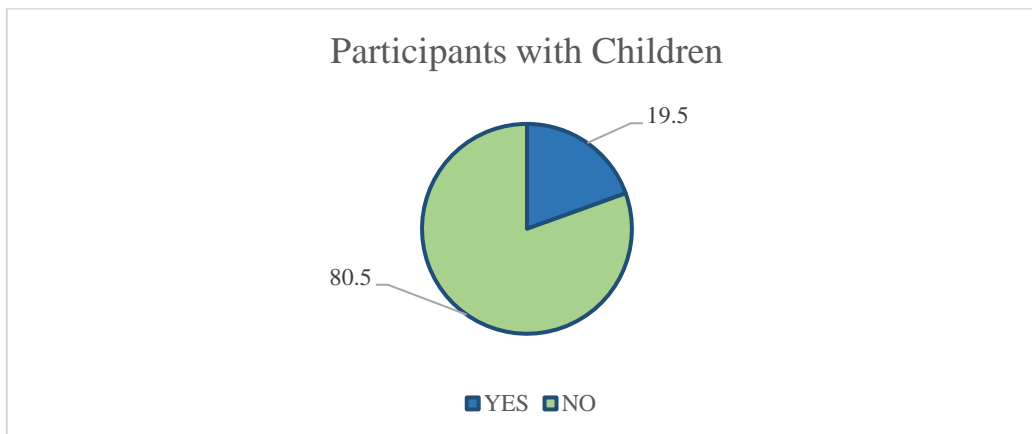
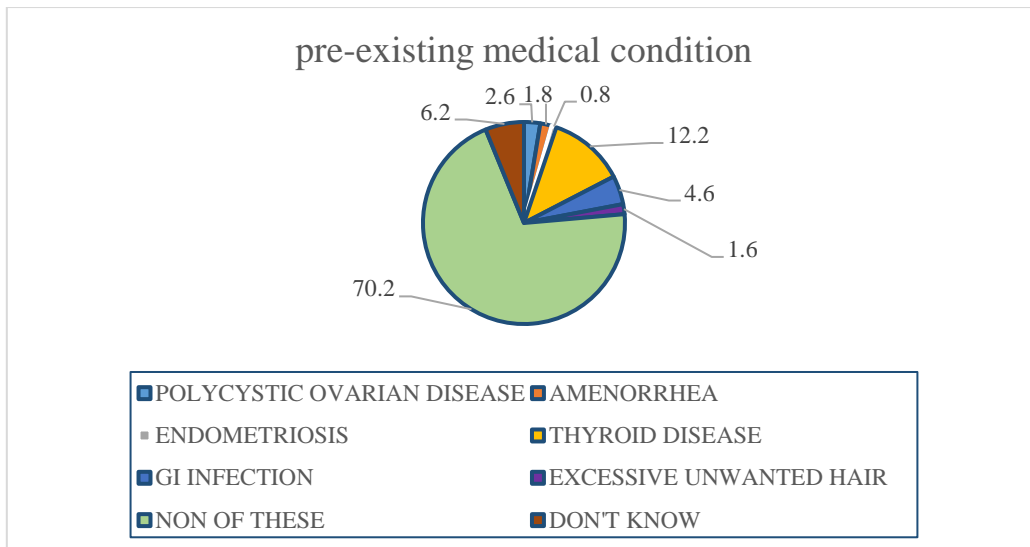
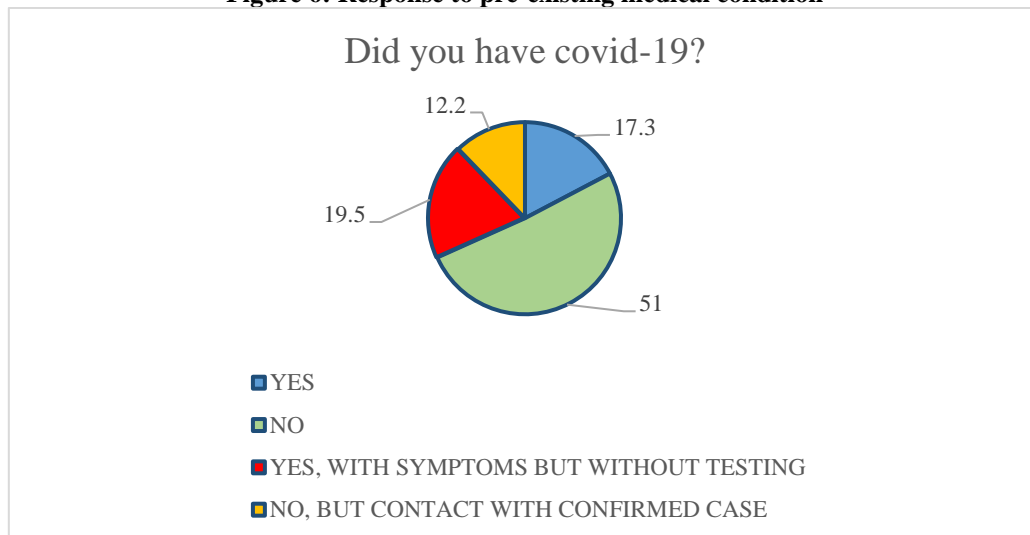


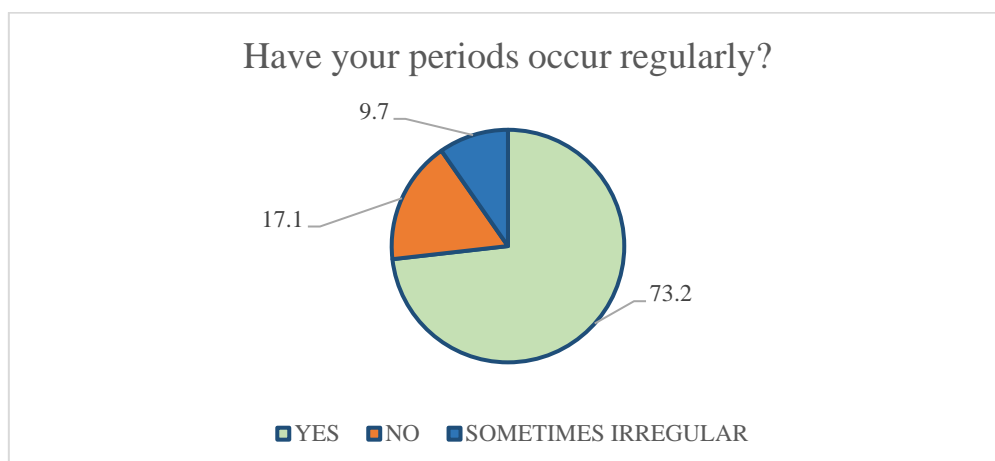
Figure 5: Response to Participants with Children



**Figure 6: Response to pre-existing medical condition**



**Figure 7: Response to Did you have covid-19?**



**Figure 8: Response to Have your periods occur regularly?**

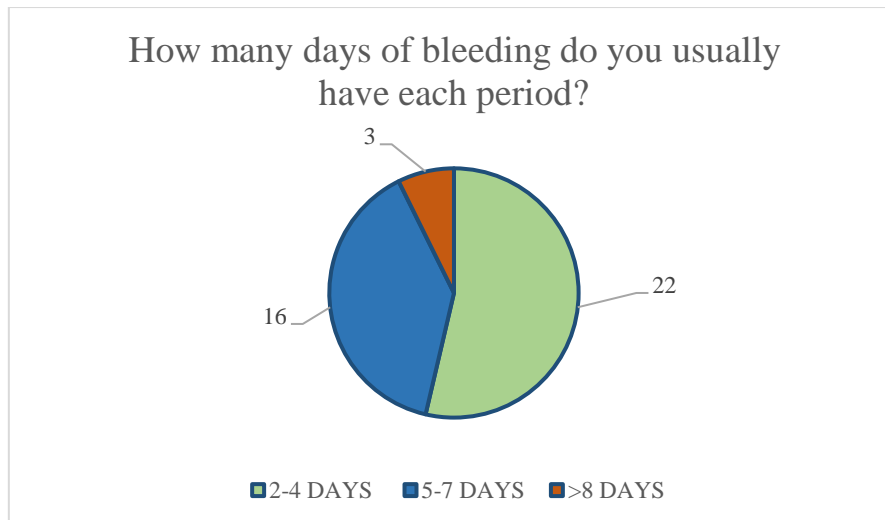


Figure 9: Response to How many days of bleeding do you usually have each period?

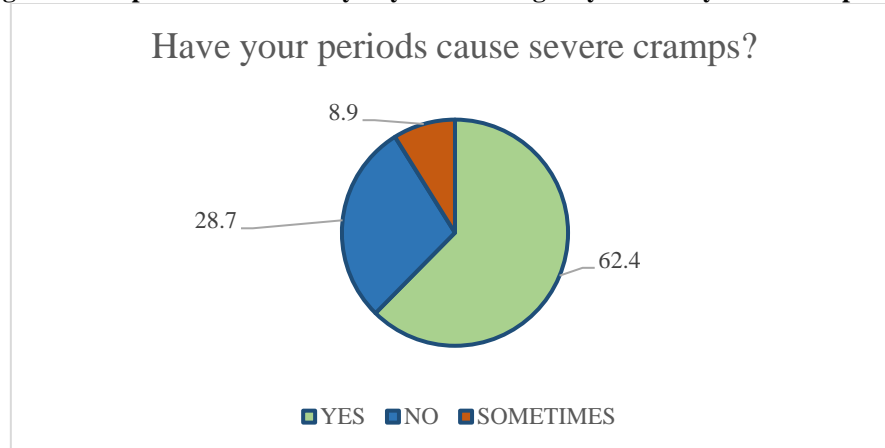


Figure 10: Response to Have your periods cause severe cramps?

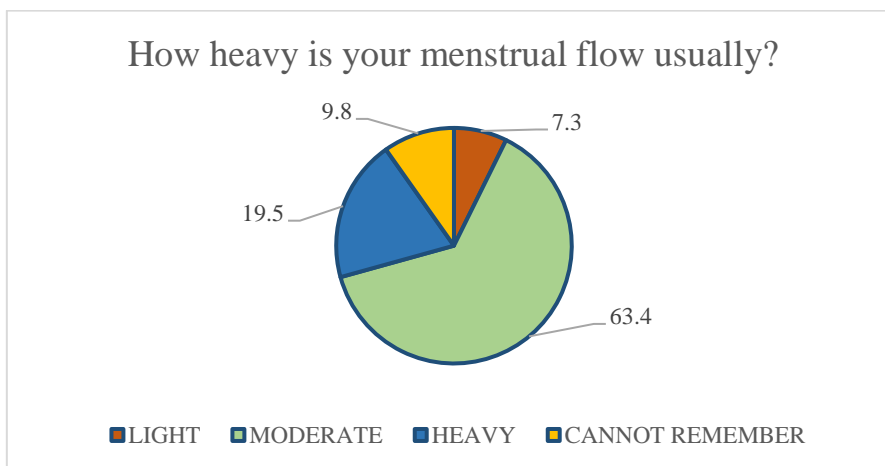
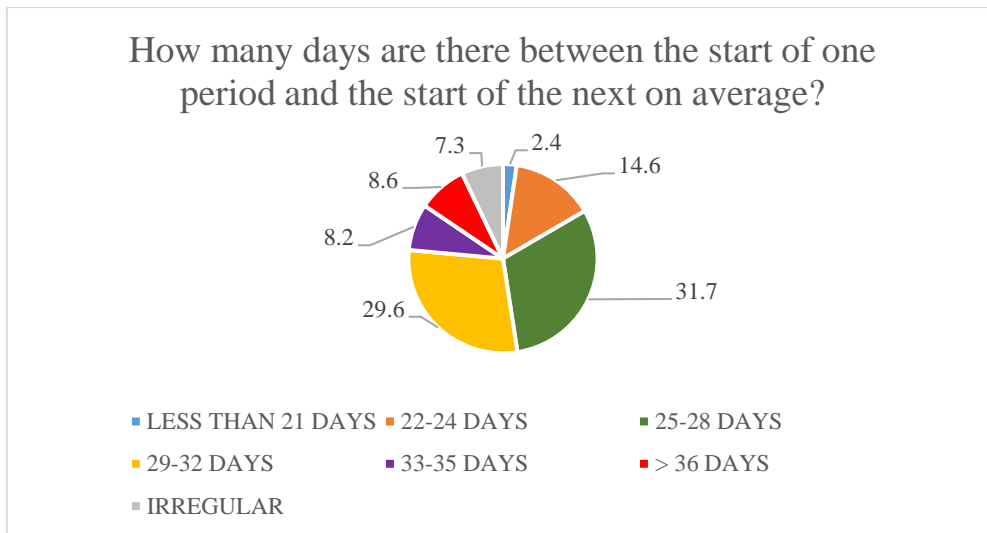
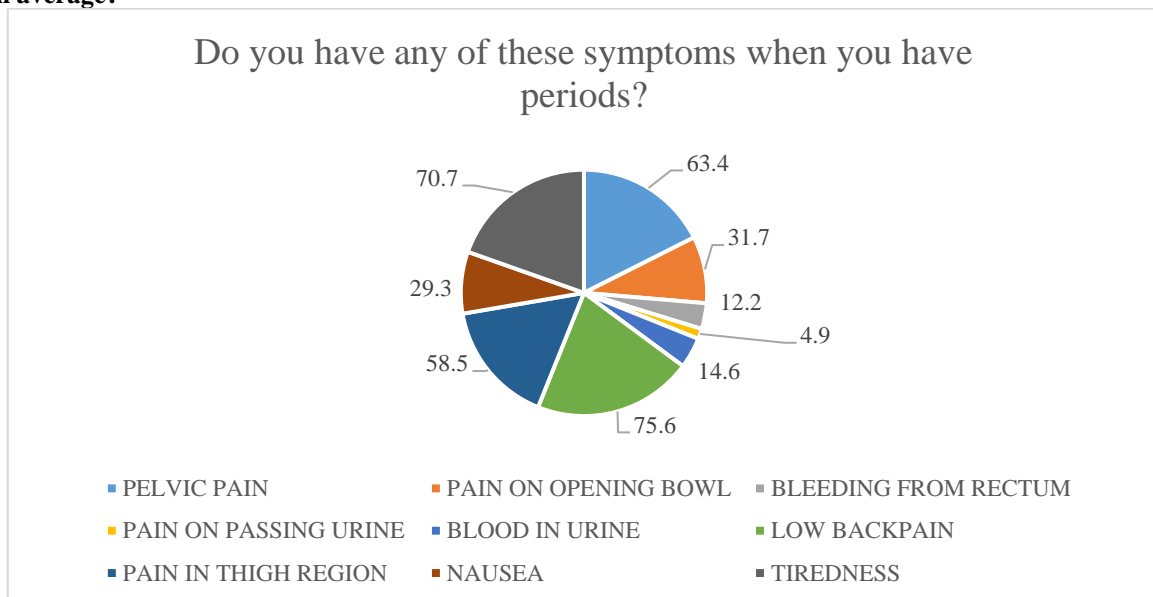


Figure 11: Response to How heavy is your menstrual flow usually?



**Figure 12: Response to How many days are there between the start of one period and the start of the next on average?**



**Figure 13: Response to Do you have any of these symptoms when you have periods?**

Out of the 41 respondents, 87.8% were from the urban area and the rest 12.2% from the rural area. Most of them were students (87.8%), unmarried (85.4%), and mainly living at college hostels (63.4%). Around 80.5% did not have any children. Most of these respondents didn't have any pre-existing medical condition and were having

healthy menstrual health with regular periods in 73.2% of cases with mostly moderate (63.4%) flow for 2-4 days (51.21%) and an average of 25-32 day in between two periods [Graph 1-13]. Total 61% of these respondents suffered from COVID-19 which affected their lifestyle to a certain extent, which is as follows [Graph 14-17]:

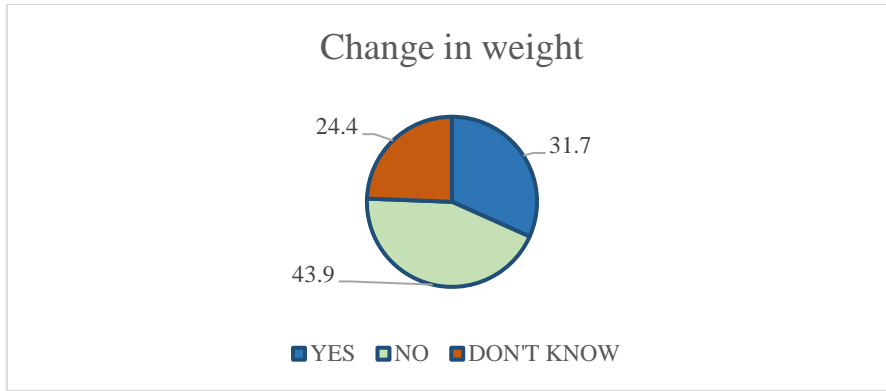


Figure 14: Response to Change in weight

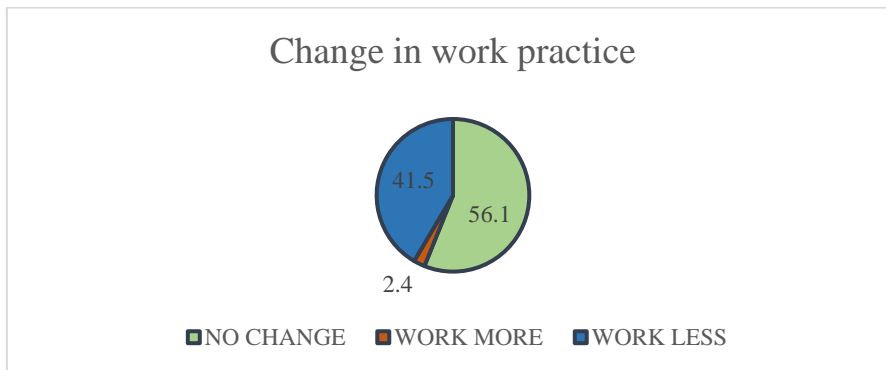


Figure 15: Response to Change in work practice

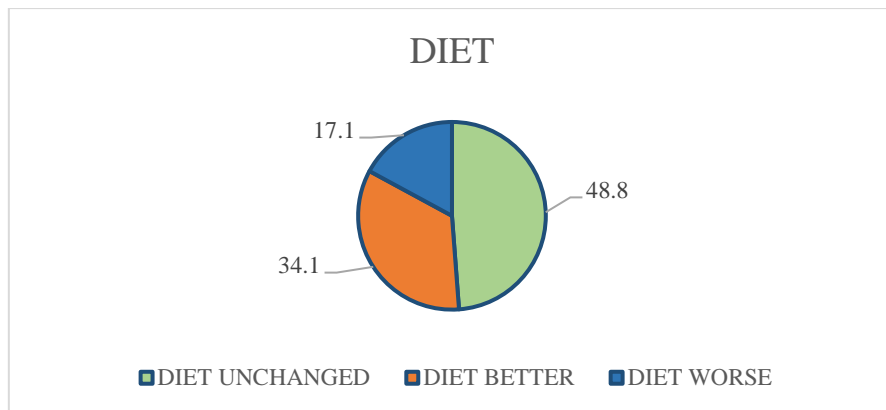


Figure 16: Response to Diet

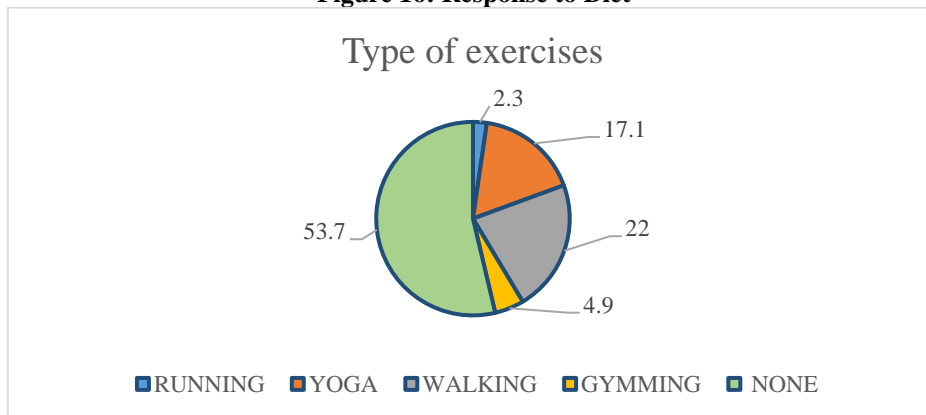


Figure 17: Response to Type of exercises



## DISCUSSION

This observational study has demonstrated that a small proportion of the female population has experienced reproductive health disturbance because of the COVID-19 pandemic. These disturbances are associated with an increase in weight, longer working hours and an unhealthier diet. A minority of women have described improvement in their reproductive health and lifestyle over the course of the pandemic. Women reported disturbances in their menstrual cycles that are known to be associated with psychological distress. Stress has an inhibitory effect on the HPG (hypothalamic–pituitary–gonadal) axis. Stress and stress hormones inhibit GnRH release from the hypothalamus, and glucocorticoids inhibit LH release and oestrogen and progesterone production by the ovary.<sup>[20, 21]</sup> Stress regulates the HPG axis through the activation of hypothalamic sympathetic neural pathways that result in norepinephrine release in the ovary.<sup>[22]</sup> FHA, chronic anovulation which is not due to an underlying organic cause, is associated with vigorous excess and an energy deficit, as well as stress, anxiety and mood disorders.<sup>[7, 8, 23 & 24]</sup> FHA has long-term health consequences including subfertility, osteoporosis, increased risk of cardiovascular disease and psychiatric disease.<sup>[25]</sup> The reported missed periods, are likely to be as a result of psychological distress and an increase in the amount of exercise being carried out. Whether these missed periods will ultimately progress to chronic anovulation is yet unknown. Women who missed periods occasionally before the pandemic reported missing them often during the pandemic. Given that some women gained weight and reported that their diet had worsened, this amenorrhoea is likely related to not only stress-related amenorrhoea, but also overweight/obesity and worsening of PCOS symptoms, both known to be affected by incremental increases in weight.<sup>[26, 27]</sup> Over half of the respondents reported worsening symptoms of pre-menstrual syndrome (PMS). Studies have demonstrated a higher prevalence of PMS among women with a

high psychosocial stress level.<sup>[15]</sup> PMS can have a significant impact on women's health and is associated with impairment of activities of daily living and mental health disorders such as anxiety disorders, postnatal, and perimenopausal depression.<sup>[27]</sup> Almost more than half of women reported periods that were heavy and painful, a significant increase compared to before the pandemic. Again this is largely unsurprising as both have been shown to be associated with stress, psychological distress and low mood.<sup>[12, 15]</sup> Those who experience low mood, tiredness, nausea and stress were more likely to report an overall change in their menstrual cycle.

## CONCLUSION

In this study, we have provided the data on the 20-45 years women population lifestyle, eating habits and adherence to the subcontinental diet pattern, stress, and mental health during the COVID-19 lockdown. The perception of weight gain was observed in 31.7% of the population, 53.7% responded that there was physical activity, 48.8% responded overall diet is unchanged, 63.4% responded to moderate menstrual flow, 61% responded to COVID-19 negative but 19.5% responded to be positive and have symptoms but did not get tested.

### *Declaration by Authors*

**Ethical Approval:** Approved

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**Source of Funding:** None

**Conflict of Interest:** The authors declare no conflict of interest.

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