

## ORIGINAL RESEARCH

# Impact of Covid 19 related lockdown on lipid profile in healthcare workers: A prospective study

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### ABSTRACT

**Background:** Lipid profile alteration is a useful indicator for early warning of the severity of various cardiovascular diseases. This study was performed to assess the effects of Covid 19 related lockdown on atherogenic lipid profiles of healthcare workers. **Material and methods:** A prospective study was carried out on 40 HCWs including 23 male and 17 females between the age of 22 and 59 years. The study was conducted in the department of Biochemistry and the department of Physiology, Government Medical College, Kathua, UT of Jammu and Kashmir. Informed written consent was obtained from the subjects and ethical clearance was obtained from Institutional Ethics Committee. Their fasting blood was collected to estimate their lipid profile which included TG, total cholesterol (TC) and HDL-C. **Results:** The present study found statistically significant increase in mean HDL-Cholesterol before and after covid-19 pandemic in health care workers. **Conclusion:** The results of this study demonstrated that lockdown had a substantial impact on participants' lipid profiles as their lifestyles changed during pandemic.

**Keywords:** Covid-19, healthcare workers, lipid profile.

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### INTRODUCTION

The coronavirus disease of 2019 (COVID-19) epidemic has made it necessary for our society to deal with both the immediate and long-term impacts of the pandemic. A significant emergency in healthcare management was the most significant immediate result. The lockdown and social isolation measures, which had a significant impact on economics and social life, were the main cause of the pandemic's indirect impacts.<sup>1</sup>

While some people were able to work remotely, others, like healthcare professionals, were required to continue doing their regular in-person work in order to address the health emergency.<sup>2</sup> But these workforce shortages and pandemic-related disruptions have occurred in the context of significant pre-pandemic shortages in some regions, many of which have been made worse by the uneven and protracted duration of the pandemic, as well as pre-existing worries about high levels of burnout and mental health issues for many healthcare professionals.<sup>3</sup>

Even if there are fewer cases and hospitalizations as of March 1, 2022, and the most pressing workforce issues may be improving temporarily, many of the pandemic's effects on the healthcare workers are cumulative and may take time to reverse.<sup>4</sup>

Numerous studies are currently being conducted to determine the effects of COVID-19-related restrictions on general population lifestyle changes, but little is known about how restrictions affect a particular population, such as healthcare professionals like doctors, nurses, and other healthcare providers, who are expected to have knowledge of nutrition, health, and lifestyle management. Our goal was to assess the effects of a changing lifestyle on atherogenic lipid profiles, in Indian healthcare workers.

### MATERIAL AND METHODS

A prospective study was carried out on 40 HCWs including 23 male and 17 females between Nov 1, 2020 and April 30, 2021. The HCWs were recruited from our tertiary care hospital and were between the

age of 22 and 59 years. The study was conducted in department of Biochemistry and the department of Physiology, Government Medical College, Kathua, UT of Jammu and Kashmir. Informed written consent was obtained from the subjects and ethical clearance was obtained from Institutional Ethics Committee vide no. IEC/GMCK/22/pharma dated 27-08-2020.

The lipid profiles of health care workers were collected from the data base of the laboratory and they were requested again in the month of April for the reevaluation after the lockdown was removed. Their fasting blood was collected to estimate their lipid profile which included TG, total cholesterol (TC) and HDL-C.

The antecubital vein was used to take a 5 ml sample of fasting blood, of which 3 ml were discharged into a vacutainer. Using a closed vacutainer system and a serum separator tube, 2 ml of blood was transferred into fluoride oxalate tubes. After allowing the samples to clot, whole blood samples were centrifuged at 2500 rpm for 5 minutes to obtain serum. Using a semi-automated analyzer, all biochemistry assays were completed in the hospital laboratory. The lipid profile was determined using the enzymatic-colorimetric method.

**DEFINITIONS**

**Health care worker** - refers to all paid and unpaid persons serving in health care settings who have the

potential for direct or indirect exposure to patients or infectious materials.<sup>9</sup>

**INCLUSION CRITERIA**

- Aged between 22 and 59 years.
- Being an active worker;
- Healthy population, without underlying diseases that do not allow passing the annual medical check-up;
- Agreeing to participate in the study.

**EXCLUSION CRITERIA**

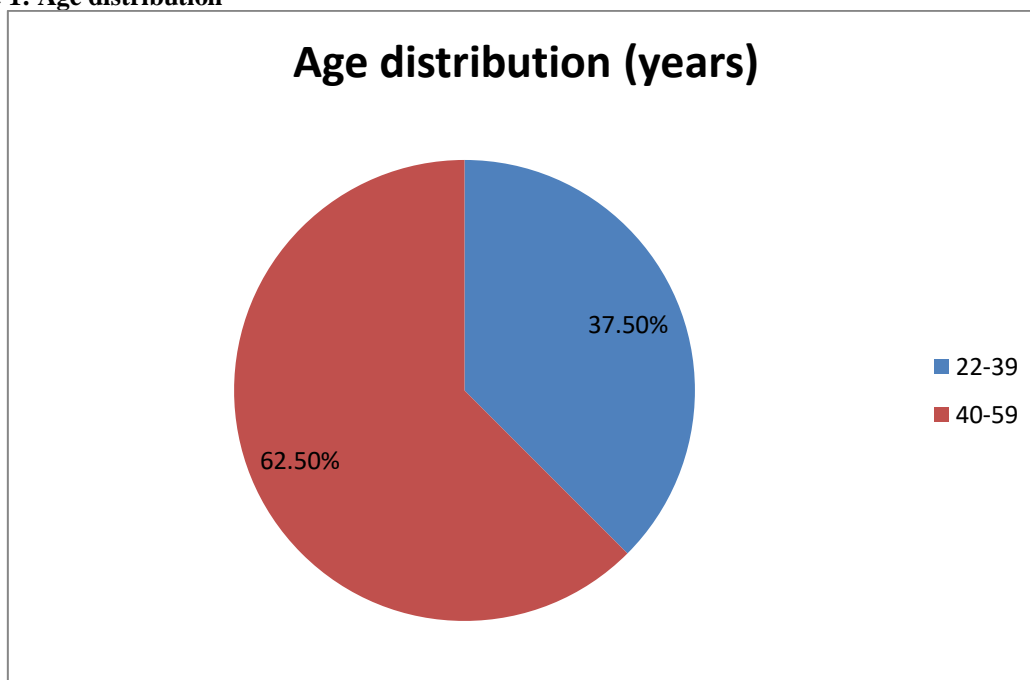
- Those who did not appear for post lockdown evaluation were excluded from the study.
- Those having deranged lipid profile and other known chronic diseases before the lockdown were excluded from the study.

**STATISTICAL ANALYSIS**

Data was described in terms of range, mean, standard deviation (SD), frequencies (number of cases), and relative frequencies (percentages) as appropriate. Comparison of quantitative variables between the study groups was done using the Student t-test. For comparing categorical data, the Chi-square test was performed and an exact test was used when the expected frequency is less than 5. A probability value (p-value) less than 0.05 was considered statistically significant. All statistical calculations were done using SPSS 21 (Statistical Package for the Social Science) version statistical program for Microsoft Windows.

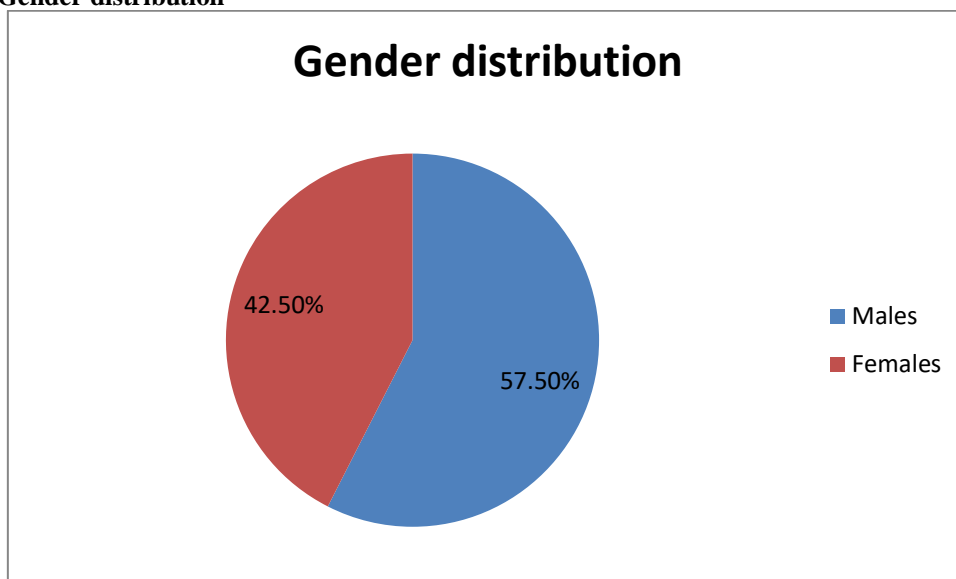
**RESULTS**

**Figure 1: Age distribution**



In the present study, maximum numbers of subjects (62.5%) were in the age group of 40-59 years & rests of the subjects (37.5%) were in the age group of 22-39 years.

**Figure 2: Gender distribution**



In the present study, males constituted 57.5% of the study subjects compared to females who constituted 42.5% of the total subjects.

**Table 1: Comparison of various parameters from before and after covid-19 pandemic in health care workers**

Characteristics	Mean/Pre	Mean/Post	t	p-value
Total Cholesterol	170.23±20.11	181.26±32.47	1.82	0.071
Triglyceride	146.48 ± 100.32	161.45 ± 59.99	-0.894	0.377
HDL	39.95 ± 8.45	35.88 ± 5.00	2.643	<b>0.012</b>

**DISCUSSION**

It is well known that frontline healthcare providers are among the populations most at risk for mental health issues. Along with painful feelings of guilt and sadness, fear and worry about spreading the disease to themselves and their families, as well as symptoms of post-traumatic stress disorder, such as anxiety, depression, nervousness, irritability, and persistent insomnia, are common.<sup>5-8</sup>

Burnout, depression, and anxiety have all been linked to occupational stress.<sup>9</sup> Mood swings and emotional fluctuations have an impact on the type and amount of food consumed, leading to an unhealthy and imbalanced diet.<sup>10</sup> Many people turn to their favourite meal for comfort and fulfilment during times of intense emotional stress. Foods high in calories that contain sweets and fats, such as biscuits, chips, pizza, ice cream, and chocolate—better known as "comfort food"—are frequently chosen because they are palatable and appear to provide an immediate sense of pleasure and fulfilment.<sup>11,12</sup> The person stopped living a healthy lifestyle, and as a result, their lipid profiles became unhealthy.<sup>13</sup>

In study population, before the lockdown we observed the mean Total Cholesterol (TC), triglycerides (TG) and HDL-C was 170.23 mg/dl, 146.48 mg/dl and 39.95 mg/dl respectively compared to the mean Total Cholesterol (TC), triglycerides (TG) and HDL-C was 181.26 mg/dl, 161.45 mg/dl and 35.88.95 mg/dl respectively post pandemic lockdown. HDL levels

showed statistically significant decrease in levels post pandemic whereas change in Total Cholesterol (TC), & triglycerides (TG) was not significant statistically.

In accordance to our study similar findings were reported by Hundekari J et al<sup>14</sup> in their Indian hospital-based investigation. 40 HCWs having direct interaction to COVID-19 patients between the ages of 25 and 40 were reported to have blood lipid profiles that were significantly linked with occupational stress. The COVID-19 assignment, according to the authors, was a risk factor for elevated triglyceride and low-density lipoprotein levels as well as lower high-density lipoprotein levels.

Also similar findings were reported by Alameri F et al<sup>15</sup>, who conducted a cross-sectional investigation using electronic surveys in Abu Dhabi hospitals and healthcare facilities. They found correlations between the degree of burnout and the risk of cardiovascular disease in healthcare professionals during the COVID-19 pandemic. Despite the poor causal effects from using a cross-sectional design, the authors came to the conclusion that healthcare personnel with burnout and emotional tiredness have an enhanced cardiovascular risk. They also suggested a connection between the elevated physical and psychological stress brought on by HCWs' added pandemic responsibilities or by the pandemic environment and the higher cardiovascular risk of HCWs.

Hyperlipidemia is a potential risk factor for COVID-19 individuals whose condition is deteriorating, as it is

directly associated to obesity and underlying medical conditions, such as coronary heart disease and metabolic syndrome, in patients with a bad prognosis.<sup>16</sup> According to a meta-analysis by Hariyanto TI et al<sup>17</sup>, dyslipidemia worsens the prognosis of COVID-19 patients. The primary neutral lipid of lung surfactant is cholesterol.<sup>18</sup> Consequently, hypercholesterolemia can disrupt the surfactant's protective properties in alveolar gaps.<sup>19</sup> On the other hand, because cholesterol plays a significant structural role in immune cell membranes, it can affect pulmonary immunological reactions and, as a result, strengthen the immune response to pulmonary infection.<sup>20,21</sup>

### LIMITATIONS

The fact that this study was conducted in a particular region and over a certain amount of time may have limited the ability to generalise the findings to other regions with diverse lifestyles. Our analysis is limited to employees who freely participated in hospital medical examinations over those years, which introduces the confounding factor of selection bias. More extensive studies are needed with greater number of subjects and in different areas to get a more definite conclusion.

### CONCLUSION

The results of this study demonstrated that lockdown had a substantial impact on participants' lifestyles since their lipid profiles changed. In this time of pandemic emergency, health workers and others who are exposed to high levels of work-related stress are particularly at risk for poor nutrition. Additional research is required to assess how specific worker categories' eating patterns change over time while under lockdown. A full understanding of how health-related behaviours, such as nutrition and exercise, have changed in this setting would be crucial for developing population-specific health promotion strategies and recommendations.

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