

## Trends of the prevalence of malnutrition in India and Himachal Pradesh, a comparative assessment

Rohit Nadda<sup>1</sup><sup>1</sup>Office of Chief Medical Officer, Chamba, Himachal Pradesh, India

E-mail ID: rohit.nadda771@gmail.com

Submission: 20.11.2023

Acceptance: 16.12.2023

Publication: 31.12.2023

[https://www.doi.org/10.56136/BVMJ/2023\\_01553](https://www.doi.org/10.56136/BVMJ/2023_01553)**Abstract**

**Introduction:** Malnutrition poses a significant threat to child health, with approximately 45% of under-five child deaths attributed to malnutrition, predominantly affecting low- and middle-income countries. This study delves into the trends of malnutrition in India and Himachal Pradesh, examining the interplay between infection and malnutrition and the escalating concern of overweight in developing countries. **Objective:** To compare malnutrition rates among under-5 children in Himachal Pradesh and India, utilizing data from the National Family Health Survey rounds (NFHS-3, NFHS-4, and NFHS-5). Additionally, the research seeks to identify districts in Himachal Pradesh with the poorest malnutrition indicators. **Materials and Methods:** A narrative description methodology is employed, utilizing NFHS fact sheets for India and Himachal Pradesh. The comparative analysis focuses on under-5 malnutrition indicators, including stunting, wasting, severe wasting, underweight, and overweight, with percentage distribution graphs for visual representation. **Results:** Wasting prevalence in Himachal Pradesh decreased from 19% in 2005 to 13.7% in 2015 but rose to 17.4% in 2019, with Kangra district showing a significant increase. Severe wasting increased in both India and Himachal Pradesh. Stunting decreased in India but increased in Himachal Pradesh, notably in Bilaspur district. Underweight declined in India but increased in Himachal Pradesh, primarily in Bilaspur district. Overweight showed an increasing trend in both India and Himachal Pradesh. **Conclusion:** Malnutrition, encompassing undernutrition and overnutrition, is escalating in India and Himachal Pradesh. While India exhibits declining trends in undernutrition, severe wasting is on the rise. Himachal Pradesh initially showed improvement but experienced a recent upturn in malnutrition indicators. Both regions face alarming rates of stunting and wasting, categorizing them as "very high" by United Nations International Children's Emergency Fund (UNICEF) standards. Despite various programs, efforts to alleviate child malnutrition have faltered.

**Keywords:** Malnutrition, stunting, wasting, underweight, overweight, Under 5 children, NFHS (National Family Health Survey)

**Introduction**

Malnutrition has been the commonest condition that affects the child health despite the various child health programs. Estimates suggest that the major underlying cause of about 45% of child mortality below five years of age is malnutrition, mainly in, Low- and Middle-Income Countries (LMICs)<sup>(1)</sup>. Malnutrition increases child susceptibility to infection, reduces the recovery rate, and increases mortality. The physical and mental growth of the child suffering from undernourishment is affected. There is a vicious cycle-malnutrition/infection cycle in which infection leads to malnutrition, and malnutrition contributes to infection; both act complementarily.

The risk of mortality in children below five years of age with severe malnutrition increases nine times than those with nourished children. It has also been an indirect cause and increase the case fatality in children with common infections like pneumonia, measles, diarrhea<sup>(2)</sup>.

Being overweight, which was once considered to be a problem in the developed world, is now increasing rapidly in

the developing world, too. Worldwide, the prevalence of overweight and obesity has tripled from 1975 to 2016<sup>(3)</sup>.

The National Family Health Survey (NFHS) is a nation-wide, large-scale, representative and multi-round survey in India<sup>(4)</sup>. Studying the time trend for the prevalence of malnutrition among less than five children reported in NFHS surveys helps to know how India and Himachal Pradesh have performed.

**Objectives**

1. To compare the prevalence of the malnutrition among children less than five years of age in Himachal Pradesh and India based on NFHS-3, NFHS-4, and NFHS-5 data sheets
2. To identify poor-performing districts in Himachal Pradesh for various malnutrition indicators

**Materials and Methods**

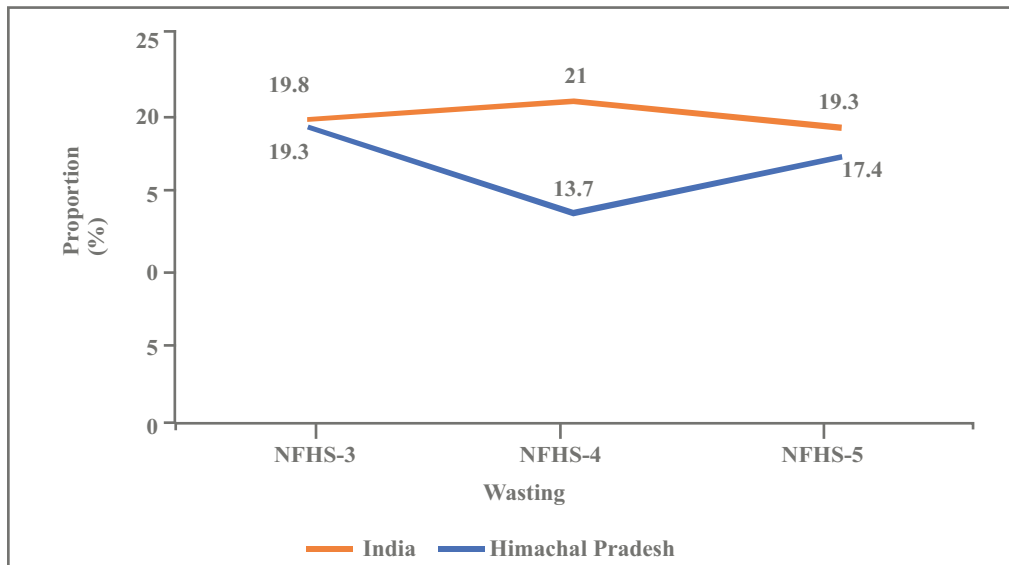
The study used secondary analyzed data from the NFHS fact sheets of India and Himachal Pradesh and adopted a narrative description of the fact sheets were obtained from the

International Institute for Population Sciences Institute (IIPS) website<sup>(4)</sup>. The data sets were compared with each other (NFHS-3, NFHS-4, and NFHS-5) for various Under-five malnutrition indicators, including stunting, wasting, severely wasting, underweight, and overweight. These categories of malnutrition are as per the World Health Organization (WHO) growth standards<sup>(5)</sup>. Wasting, stunting and underweight are defined as weight-for-height, height-for-age, and weight-for-age, and below two Standard Deviations (SD) from the median respectively. For severe wasting, weight for height below -3SD and for overweight, the weight for height greater than 2SD from a median of the WHO growth standard was considered. The proportions of

malnutrition categories for India are compared with Himachal Pradesh state and districts and were plotted as graphs and tables.

**Results**

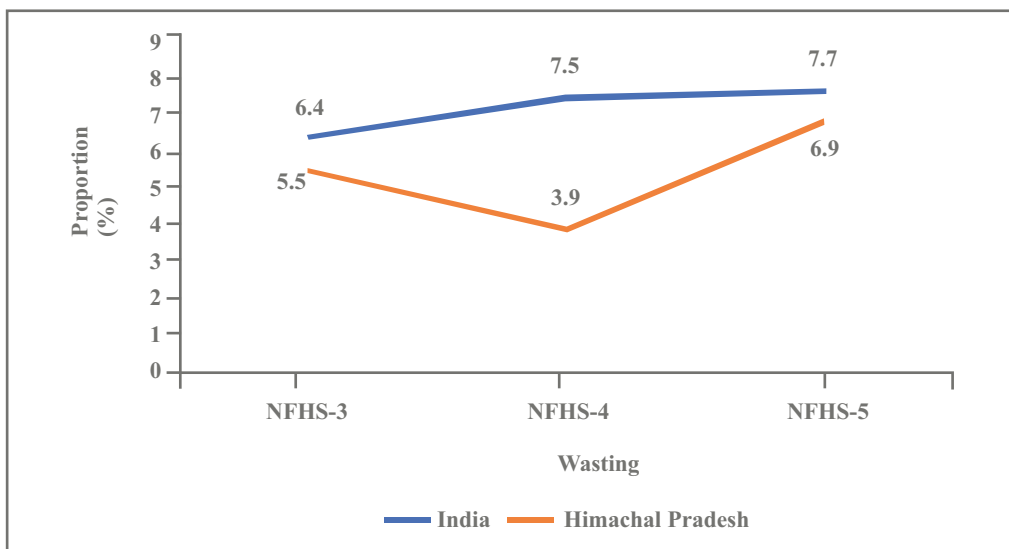
The prevalence of wasting (an indicator of acute malnutrition) has remained around 20% in the last 15 years in India. While in Himachal Pradesh, the wasting prevalence was 19% in 2005, which progressively decreased to 13.7% in 2015 but then further increased to 17.4 in 2019. The maximum increase in Himachal Pradesh is shown by Kangra district (from 11.3% to 19.4%) in the last five years (Refer Table 1 and Figure 1).



**Figure 1: Comparison of prevalence of wasting in India and Himachal Pradesh**

Severe wasting has increased overall in the last 15 years, both in India and Himachal Pradesh. In India, it progressively increased from 6.4% in 2005 to 7.7% in 2020; in Himachal Pradesh, it initially decreased from 5.5% in 2005 to 4% in

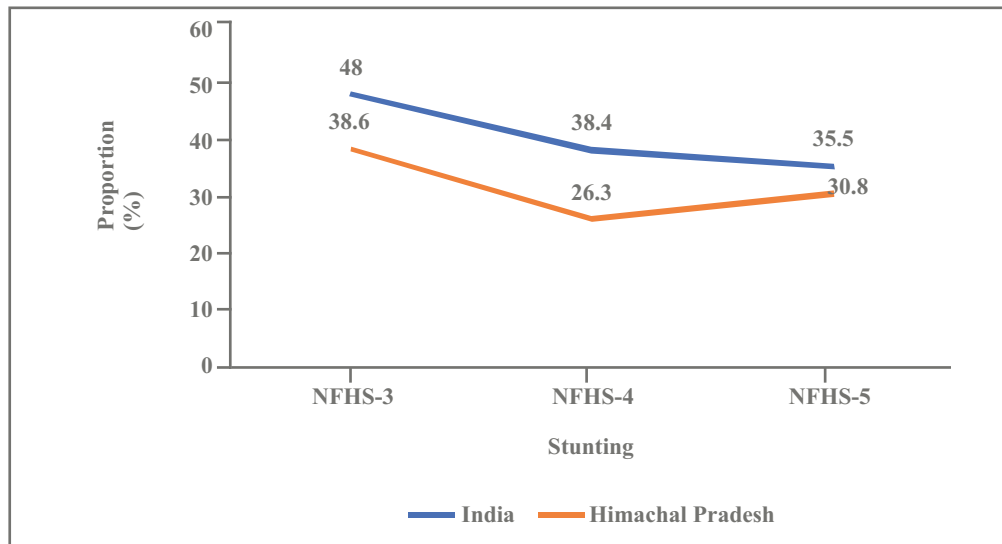
2015 but further increased to 7% in 2020. The maximum increase in Himachal Pradesh is shown by Shimla district (from 2.2% to 7.8%) in the last five years (Refer Table 1 and Figure 2).



**Figure 2: Comparison of prevalence of severe wasting in India and Himachal Pradesh**

The stunting (an indicator of chronic malnutrition) has decreased in India from 48% in 2005 to 38.4 in 2015 and then slightly decreased to 35.5% in 2020. In Himachal Pradesh, the prevalence of stunting was 38.6% in 2005, which

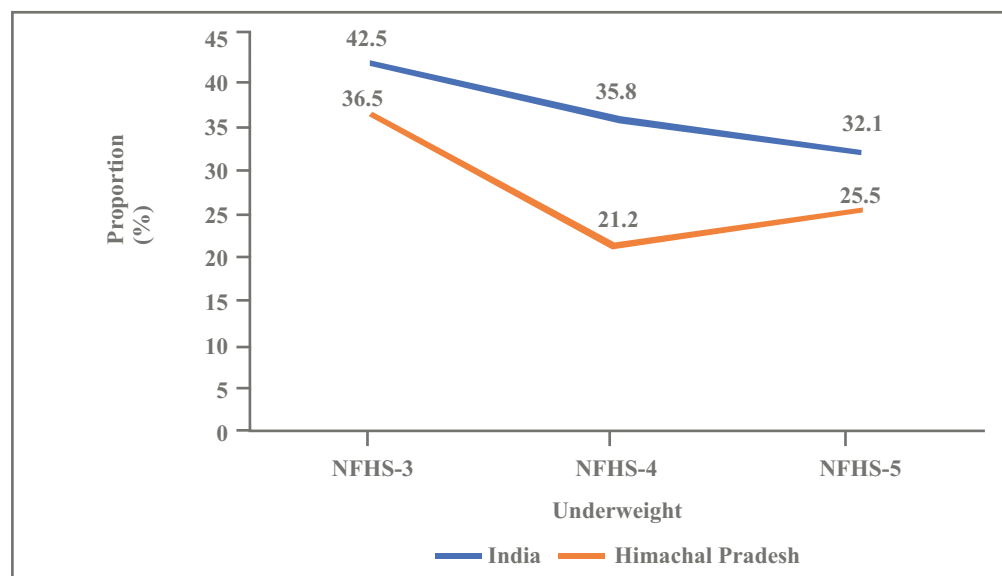
decreased to 26.3% in 2015, but in 2020 it has increased to 30.8%. The stunting in Himachal Pradesh in the last five years has increased, and the maximum increase was seen in the Kullu district (from 19.0% to 35.9%) (Refer Table 1 and Figure 3).



**Figure 3: Comparison of prevalence of stunting in India and Himachal Pradesh over last 15 years**

The underweight (indicator of acute and chronic malnutrition) in India has decreased from 42.5% in 2005 to 35.8% in 2015 and then to 32.1% in 2020. In Himachal Pradesh, it was 36.5% in 2005 and decreased to 21.2 in 2015

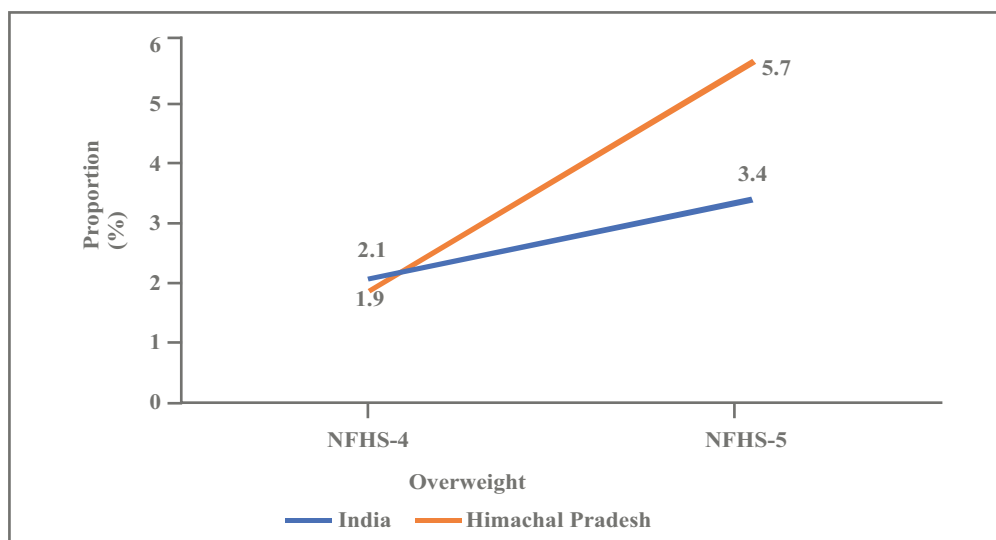
but then increased to 25.5 in 2020. The maximum increase in Himachal Pradesh is shown by Bilaspur district (from 23.4 to 38.8%) in last five years (Refer Table 1 and Figure 4).



**Figure 4: Comparison of prevalence of underweight in India and Himachal Pradesh in last 15 years**

The overweight has shown an increasing trend in India and Himachal Pradesh as it has increased from around 2% in 2015 and then increased to 3.4% in India and 5.7% in Himachal Pradesh in 2020. (No data was collected for overweight in

NFHS-3). The maximum increase in Himachal Pradesh is shown by Kullu district (from 2.5 to 11.2%) in the last five years (Refer Table 1 and Figure 5).



**Figure 5: Comparison of prevalence of overweight in India and Himachal Pradesh in last 5 years**

**District-wise prevalence of Wasting, Severe wasting, Stunting, Underweight, and overweight in children under five in Himachal Pradesh**

Table 1 shows the district-wise prevalence of various malnutrition indicators in Himachal Pradesh and the change in indicators from 2015-16 to 2020-21. The positive signage (+) shows an increase in prevalence (shown in bold for the

maximum increase among all districts), while negative signage shows a decrease in prevalence over the last five years (2015-2020).

**Table 1: District-wise prevalence of various malnutrition indicators in Himachal Pradesh and the change in indicators from 2015-16 to 2020-21.**

Name of District	Prevalence of wasting in children under 5			Prevalence of severe wasting in children under 5			Prevalence of Stunting in under five children			Prevalence of Underweight in under 5 children			Prevalence of Overweight in under 5 children		
Bilaspur	13.1	12	-1.1	4.5	2.8	-1.7	27.2	40.1	+12.9	<b>23.4</b>	<b>38.8</b>	<b>+15.4</b>	1.6	5	+3.4
Chamba	15	15.4	+0.4	4.8	5.8	+1	29.9	42.6	+12.7	22.5	26	+3.5	2.4	9	+6.6
Hamirpur	12.6	14.9	+2.3	5	4.9	-0.1	29.3	27.3	-2	19.4	23.6	+4.2	3.3	0.8	-2.5
Kangra	<b>11.3</b>	<b>19.4</b>	<b>+8.1</b>	2.4	7.7	+5.3	25.6	28	+2.4	23.3	32	+8.7	1	2.3	+1.3
Kinnaur	12.4	11.3	-1.1	5.4	4.3	-1.1	18.4	32.2	+13.8	15.9	18.9	+3	2.4	9	+6.6
Kullu	11.3	16.1	+4.8	5.4	5.8	+0.4	<b>19</b>	<b>35.9</b>	<b>+16.9</b>	<b>11</b>	<b>25.6</b>	<b>+14.6</b>	<b>2.5</b>	<b>11.2</b>	<b>+8.7</b>
Lahul and Spiti	20.8	16.3	-4.5	7.3	10.3	+3	23	28.5	+5.5	16.1	18.4	+2.3	5	7.4	+2.4
Mandi	13.1	19.9	+6.8	4.5	8	+3.5	26.3	31.3	+5	16.2	21.3	+5.1	2.4	7	+4.6
Shimla	15	15.5	+0.5	<b>2.2</b>	<b>7.8</b>	<b>+5.6</b>	30.3	27.1	-3.2	24.8	14.9	-9.9	1.7	8.1	+6.4
Sirmaur	19.5	18.5	-1	7.1	9.1	+2	23.5	28.6	+5.1	25.3	24.2	-1.1	2.6	6.6	+4
Solan	17.5	20.9	+3.4	2.9	5.6	+2.7	27.6	32.3	+4.7	29.4	26.7	-2.7	1.9	5.7	+3.8
Una	10.7	13.1	+2.4	3.5	5.9	+2.4	22.6	24.7	+2.1	14.6	25.8	+11.2	0.8	2.8	+2

**Discussion**

The NFHS study analysis of the last three rounds showed that the prevalence of acute malnutrition (wasting) has remained around 20% over the last 15 years. As per United Nations International Children's Emergency Fund (UNICEF), India has a prevalence of wasting 18.7%, which is the highest of any other region in the world<sup>(6)</sup>.

As per NFHS, the prevalence of chronic malnutrition (stunting) in India came down to 35.5% in 2020, and according to UNICEF data, it was 31.7% in 2022<sup>(6)</sup>.

According to UNICEF, e" 30% stunting is very high, and both India as well as Himachal Pradesh fall in this category among all countries in the world. It means that nearly every third under five children in India suffer from chronic malnutrition.

Wasting e" 15% is categorized as very high as per UNICEF, and both India as well as Himachal Pradesh fall in this category among all countries of the world<sup>(6)</sup>.

The United Nations Sustainable Development Goals (SDG-2) emphasizes efforts to eliminate hunger and all forms of malnutrition by 2030<sup>(7)</sup>. Supplementary nutrition/meals under Integrated Child Development Services (ICDS) has been implemented in India to reduce the food gap among children under five and prevent them from developing undernutrition<sup>(8)</sup>. Besides, there are many other programs and schemes to reduce undernutrition like Special Nutrition Programme, Balwadi Nutrition Programme, Poshan Abhiyaan<sup>(9,10,11)</sup>. However child malnutrition could not be reduced. The data collected in NFHS-5 was collected before the COVID-19 pandemic. So, these malnutrition trends in India and Himachal Pradesh in NFHS-5 are the status before the pandemic. It is most likely that restrictions of COVID-19 and lockdowns have further worsened this malnutrition trend<sup>(12,13)</sup>. The job loss/insecurity among marginalized and poor people has increased in this pandemic, which further affects the family nutrition intake level. Children and women are mostly affected as they are the most vulnerable groups among households. The under-five children are most susceptible to it, and their supplementary nutrition intake at *Anganwadi* has also been lost in this pandemic.

The present study also reported poor-performing districts in Himachal Pradesh. The maximum increase in the prevalence of wasting, severe wasting, stunting, underweight, and overweight from 2015 to 2020 was found in Kangra, Shimla, Kullu, Bilaspur, and Kullu, respectively.

As per NFHS data, the overweight has shown an increasing trend in India, increasing from around 2% in 2015 to 3.4% in 2020. According to UNICEF data, the overweight was 2.8% in 2022<sup>(6)</sup>. Thus the country would be facing the double burden.

### Conclusion

Malnutrition is a global crisis. It can be undernutrition as well as overnutrition. Overnutrition has increased both in India and Himachal Pradesh in the last five years, which is of great concern as it will increase the double burden of malnutrition in our country. In India, undernutrition indicators like stunting and underweight have shown a declining trend in the last 15 years, while severe wasting has progressively increased. In Himachal Pradesh, all undernutrition indicators have shown a declining trend from 2005 to 2015, but then it has increased in the last five years (2015-2020). There is a need to develop and implement specific strategies in poor-performing districts to reduce malnutrition in children below five years of age.

**Conflict of Interest:** Nil

**Source of Support:** Nil

**Copyright** © 2023 Bharati Vidyapeeth Medical Journal (BVMJ). This is an open access article, it is free for all to read, download, copy, distribute, adapt and permitted to reuse under Creative Commons Attribution Non-CommercialShareAlike: CC BY-NC-SABY 4.0 license.

### ORCID

Rohit Nadda  0009-0005-9579-6922

### Ethical consideration

The present data is based on secondary data analysis and hence ethical considerations are not involved.

### Data availability statement

Data used for the present study is available in public domain.

### References

1. World health organization. Newsroom, Fact sheets. Malnutrition. Available at: <https://www.who.int/newsroom/fact-sheets/detail/malnutrition>. Accessed on 20 August 2022.
2. K Park. Park's Textbook of Preventive and Social Medicine. Jabalpur: M/s Banarsidas Bhanot Publishers; 25<sup>th</sup> ed, 2019.
3. World health organization. Newsroom, Fact sheets. Overweight and obesity. Available at: <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>. Accessed on 15 December 2023.
4. International Institute for Population Sciences. National Family Health Survey: India. Mumbai: IIPS; 2016. Retrieved from: <http://rchiips.org/nfhs>. Accessed on 15 December 2023.
5. World Health Organization. Nutrition Landscape Information System. Available at: <https://apps.who.int/nutrition/landscape/help.aspx?menu=0&helpid=391&lang=EN#:~:text=These%20indicators%20are%20defined%20as,WHO%20Child%20growth%20standards%20median>. Accessed on 14 December 2023.
6. United Nations Children's Emergency Fund. Topic. Child malnutrition. Available at: <https://data.unicef.org/topic/nutrition/malnutrition>. Accessed on 14 December 2023.
7. United Nation Development Project. Sustainable Development Goals. Available at: <https://www.undp.org/sustainable-development-goals/zero-hunger>. Accessed on

8. Ministry of Women and Child Development. Integrated Child Development Services (ICDS) Scheme. Available at: <https://wcd.nic.in/integrated-child-development-services-icds-scheme>. Accessed on 14 December 2023.
9. Food and Agriculture Organization. Other important programmes to combat malnutrition in India. Available at: <https://www.fao.org/3/x0172e/x0172e08.htm>. Accessed on 15 December 2023.
10. National Institute of Health and Family Welfare. National Health Programme. Nutritional Programme. Available at: <https://www.nihfw.org/NationalHealthProgramme/NutritionalProgramme.html>. Accessed on 15 December 2023.
11. Ministry of Women and Child Development. Poshan Abhiyan e-Bulletin. September 2022. Issue 1. Available at: <https://wcd.nic.in/sites/default/files/POSHAN-Abhiyaan-e-Bulletin-Sep-2022.pdf>. Accessed on 15 December 2023.
12. National Human Rights Commission India. The Impact of Covid-19 Pandemic over the State of Food Security and Nutrition in India. Available at: <https://nhrc.nic.in/sites/default/files/Group%205%20June.pdf>. Accessed on 15 December 2023.
13. Khandelwal S. Malnutrition and COVID-19 in India. 2022 April 9. Available at: [https://link.springer.com/chapter/10.1007/978-981-16-7385-6\\_9](https://link.springer.com/chapter/10.1007/978-981-16-7385-6_9). Accessed on 15 December 2023.