Gizi Indon 2022, 45(2):101-108
GIZI INDONESIA
Journal of The Indonesian Nutrition Association
p-ISSN: 0436-0265 e-ISSN: 2528-5874

# CO-EXISTENCE OF UNDER AND OVER-NUTRITION AMIDST THE COVID-19 PANDEMIC

*Koeksistensi Gizi Kurang dan Gizi Lebih di Tengah Pandemi COVID-19*

**Lestari Octavia[1], Iskari Ngadiarti[2]**
[1]Gunadarma University, Depok, Indonesia
[2]Jakarta Health Polytechnic, Ministry of Health, Jakarta, Indonesia
E-mail: lestari_octavia@staff.gunadarma.ac.id

Diterima: 09-03-2022 Direvisi: 04-08-2022 Disetujui terbit: 13-08-2022

## ABSTRACT

**COVID-19 pandemic resulted in the prevalence of under, and over-nutrition increased. As a representative of undernutrition, stunting has become a severe public problem. Stunting was a manifestation of chronic malnutrition found in under-five-year-old children. The short stature of the children would hamper growth and development and might affect the disease progression in the future. Not only stunting but also obesity has also become a new issue in low-middle income countries (LMICs). The shift of urbanization heightened the prevalence of obesity in LMICs. This narrative review highlighted the increment of malnutrition in LMICs based on the literature findings during the COVID-19 pandemic and some possible factors related to the outcome. The articles for this review were obtained from verified international journal articles in the National Centre for Biotechnology Information (NCBI)/PubMed and Cochrane Library website. Eleven papers were collected to address malnutrition during the pandemic. Some related factors are: socioeconomic, dietary intake, sanitation and hygiene, health facility, and self-isolation contributed to the double malnutrition problem. Therefore, it is mandatory to suggest the appropriate approach to mitigate malnutrition in children by enriching nutrition education and knowledge programs to assist in resolving the public health problem.**

**Keywords: undernutrition, overnutrition, pandemic, low-middle income countries, children**

## ABSTRAK

**Pandemi COVID-19 ditandai dengan meningkatnya jumlah anak yang mengalami gangguan gizi, baik gizi kurang maupun lebih. Stunting, sebagai salah satu bentuk gizi kurang telah menjadi masalah kesehatan masyarakat yang harus mendapat perhatian serius. Stunting merupakan manifestasi kurang gizi kronis, yang ditemukan pada anak berusia di bawah lima tahun. Postur tubuh anak yang pendek dapat mengganggu pertumbuhan dan perkembangan dan dapat menyebabkan risiko kemunculan penyakit di masa yang akan datang. Tidak hanya masalah stunting, tapi juga obesitas menjadi masalah bagi negara berpenghasilan rendah-menengah. Review naratif ini akan melihat kenaikan prevalensi kurang gizi di negara berpenghasilan rendah-menengah dan kemungkinan faktor yang mempengaruhi luaran berdasarkan kajian literatur selama pandemi COVID-19. Tulisan yang dijadikan bahan review berasal dari telusur pustaka dari *National Centre for Biotechnology Information* (NCBI)/PubMed dan laman *Cochrane Library*. Sebelas artikel berhasil dikumpulkan untuk menyampaikan permasalahan kurang gizi selama pandemi. Beberapa faktor yang teridentifikasi berkontribusi dalam masalah kurang gizi adalah: sosioekonomi, asupan makanan, sanitasi dan higiene, fasilitas keseahatan, dan isolasi individu yang berperan dalam masalah beban gizi ganda. Oleh karena itu menjadi kewajiban untuk dapat merumuskan mitigasi yang tepat pada anak dengan memperkaya informasi mengenai pendidikan dan pengetahuan gizi untuk menyelesaikan permasalahan kesehatan masyarakat.**

**Kata kunci: kurang gizi, lebih gizi, pandemi, negara pendapatan rendah-menengah, anak-anak**

**Doi: 10.36457/gizindo.v45i2.657**
**www.persagi.org/ejournal/index.php/Gizi_Indon**

## INTRODUCTION

Malnutrition is one of the most challenging public health problems worldwide. In low- and middle-income countries (LMICs), the COVID-19 pandemic problem increases the risk of children and maternal malnutrition.[1] Before the pandemic, the magnitude of the malnutrition problem already prevailed; the International Food Policy Research Institute calculated that there would be additional 140 million people living in the extreme poverty line due to pandemics.[2] COVID-19 pandemic ruined the economy and health worldwide, affecting the food system, health care services for women and children, sanitation and hygiene.[3,4] Yet, COVID-19 also shifted the dietary habit and physical activity due to travel restrictions, school closure, self-isolation, social distancing, and limited accessibility to a health facility.[3,5] COVID-19 pandemic pushed the budget allocation for overcoming the impact; reprioritizing and adjustments were taken to save lives.[6]

A recent estimation projected that the prevalence of wasting could increase up to 50 percent, with approximately 40,000–2,000,000 child mortality. Also, 149 million children under five-year-old are at risk of being stunted, a reduction from 166 million in 2012 but still far from the required global targets.[3] In Indonesia, similar to other LMICs, the restriction to access health facilities reduced the immunization coverage, primary care services, and growth monitoring to Integrated Health Post (*Posyandu*) regularly.[4,7] This problem should be well-managed and addressed to minimize the future linear growth problem and stunting. Stunting as a manifestation of chronic malnutrition increases the risk of the children having growth deterioration, low work performance, cognitive impairment, and high susceptibility to non-communicable diseases (NCDs) in the adult period.[8] At the community level, stunting causes loss of economic productivity and increased healthcare costs since the poor health quality of individuals with stunted history. The potential of financial loss because of stunting has a serious impact on economic productivity and growth—stunted adult height had a 1.4 percent loss in economic productivity, and stunting can decrease a country's gross domestic product (GDP) by up to 3 percent.[9] Indonesia has adopted the Scale-Up Nutrition (SUN) movement to end the malnutrition problem, particularly stunting in the area with a high prevalence, using Integrated Nutrition Interventions involving a multisector approach.[10]

Children's health was one of the crucial issues in the Sustainable Development Goals (SDGs).[11] At the same time, the pandemic could increase the prone to the virus's infection, which could interfere with the growth and development of the children. The pandemic increased the risk of disease, illness, and distress among adults and children during the pandemic.[12] Pandemic required the parents and caregivers to promote growth and development and reduce the risk of contagion of the virus.

During the pandemic, the Indonesian government surveyed the magnitude of malnutrition among under-five-year-old children. The release from the government on Dec 27$^{th}$, 2021, was that the prevalence of stunting among under-five-year-old children reached 24,4 percent. The goal of the stunting reduction program was 14 percent by 2024.[13]

Although children were likely hospitalized due to mild symptoms, the pandemic's indirect effect would increase this group's vulnerability. Obesity and overweight are other problems raised during the pandemic.[14] Self-isolation tends to compensate the mental health by consuming dense-energy food, high sugar, low fibre, and essential micronutrients.[14,15] School closure and virtual class restricted their physical activity and increased heavily high-calorie consumption.[16] COVID-19 pandemic reduced 50 percent of physical activity and exercise before the closure.[17] School closure also increased the heightened stress level among the children and parents that might threaten brain development, mental health, cognitive impairment, and working performance in adults.[12]

This review aimed to elaborate on under and overnutrition co-exist during the pandemic to design an appropriate program to manage malnutrition in the LMICs. In addition, this article would benefit in developing a program for stunting children in LMICs. Indonesia is also one country that seriously involves many approaches to eradicating the malnutrition problem to meet the SDGs.

## METHODS

The source of references summarised in this paper was derived from the article published in the reputable search engine Pubmed (https://pubmed.ncbi.nlm.nih.gov) and Cochrane (https://www.cochrane.org/). Search findings identified some relevant studies that support this paper's idea. We optimized the search engine by inserting keywords relevant to the study's objective. These are: "stunting AND pandemic", "malnutrition AND pandemic", and "children's nutritional status AND pandemic."

We included some articles that meet the prerequisite: (1) the references published within the pandemic, Jan1st, 2020 – Jan 1st, 2022. In addition, (2) the paper was written in English, (3) the manuscript was published in a reputable journal, and (4) the paper put the exemplar on governing the stunting problem. Therefore, the exclusion criteria for the paper in this review are: (1) the references were published before Jan 1st, 2020, and after Jan 1st, 2022, (2) the paper was written not in English, and (3) the manuscript was not published in a reputable journal, (4) the paper did not elaborate the strategy to diminish the stunting problem in the country.

The search result came with 11 articles; we identified some possible factors related to the high prevalence of stunting during this pandemic. Figure 1 describes the search of the articles collected for this review. We underlined the necessity of this issue and recognized the related factors to solve the problem. Identifying the problem would harness the authority to formulate the policy to eradicate malnutrition.

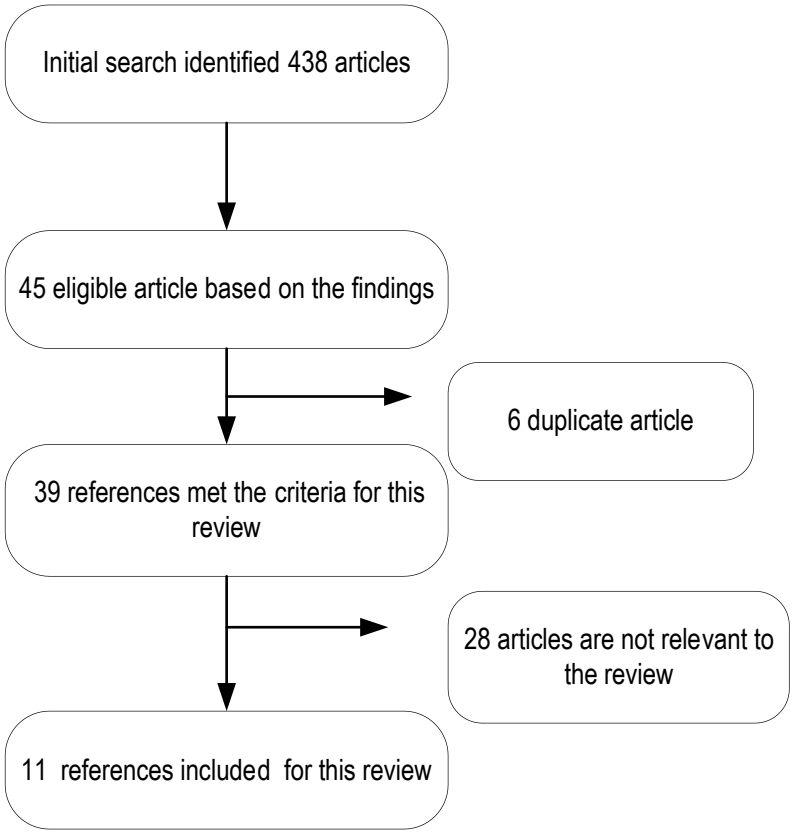


Figure 1
The search of the articles for the review.

## RESULTS

From the findings, we figure out some possible factors contributing to stunting among the children in LMICs, like in Indonesia and similar countries.

Most papers highlighted the risk of malnutrition, under and over-nutrition, among the children during this pandemic, especially those who become an orphanage.[3,18] The assessment of malnutrition could be applied using the public health problem indicators in the country during the pandemic.[1] Self-isolation, restriction to travel, and lockdown tend to change the habits and lifestyle; the physical activity became less; the dietary pattern shifted to less nutritious food; poor sleep quality.[9,21,23] During the pandemic, people lost their occupations, lowering their income and difficulties with nutritious meals, good sanitation and hygiene, and public health access. Women and children are at greater risk of malnourishment, including breastfed infants.[22,19] Admission to the hospital among children was higher in the pandemic than in the prior period.[20] Nutrition education would be beneficial to all the stakeholders in reducing the risk of malnutrition.[24,25]

This article highlights the malnutrition problem during the pandemic while it prevailed before the period. However, this article lacks further analysis on the existence of malnutrition due to the limited articles included in this review.

Table 1
The references presented the exemplar of countries in lessening the magnitude of the stunting problem during the COVID-19 pandemic

| Author, year | Possible factors | Findings |
|---|---|---|
| Akseer *et al*., 2020[3] | Dietary intake, economic status, education level, sanitation facility | A safety net program, sanitation, and mobile community services would benefit the mitigation program for vulnerable groups during the pandemic. |
| Bridgman *et al*., 2021[18] | Shortage of source of clean water, sanitation, and hygiene contributed to malnutrition in orphanage children | Double orphanage children are at greater risk of malnutrition due to poor water and sanitation hygiene (WASH) facilities correlated to stunting. |
| Jawaldeh *et al*., 2021[9] | The inability to access safe and nutritious food and health services will increase the risk of stunting. | Easing affordability, access to safe and nutritious foods and priority health services will facilitate tackling the stunting problem. |
| Mertens *et al*., 2020[1] | The quantification of malnutrition assessment using some public health problem indicators | Those indicators are: death rates for child growth failure (stunting, underweight, and/or wasting), years lived with disability (YLD) attributed to vitamin A and iron deficiencies, and high body mass index (BMI). |
| Jácome *et al*.,2021[19] | Nutrient fulfilment for an infant is mandatory, even during the pandemic. Low coverage of breastfeeding could affect mortality and morbidity in a certain period. | Breastfeeding coverage was low due to the physical isolation against SARS-CoV-2. Therefore, a lower prevalence of breastfeeding impacts infant morbidity and mortality in the short and medium term. |
| Nuzhat, S., *et al*., 2022[20] | The COVID-19 pandemic determined the admittance to hospitals in LMIC. | Children admitted during the COVID-19 pandemic period were significantly higher than before the pandemic. |
| Fidanci, I., *et al*., 2020[21] | The shift in the quality of sleep and nutrition would affect the health status of the children in the pandemic. | Sleep problems increasing significantly with an accompanying anxiety state may lead to developmental issues and deepening psychological disorders during the pandemic. |

| | | |
|---|---|---|
| Panthi, B., *et al*., 2020[22] | Self-isolation increases the risk of malnutrition among children and women in Nepal. | Women and children face a greater risk of malnutrition, leading to morbidity and mortality. Therefore, the response plan should include those groups to improve their nutritional status. |
| Ostermeier, E., *et al.,* 2021[23] | Self-isolation reduces physical activity and children's health behaviour. | Overall, COVID-19 protocols have negatively influenced children's physical activity and exercise, which shift the children's health behaviours. |
| Cena, H., *et al.,* 2021[24] | Nutrition education intervention for individuals and families would benefit from weight management programs during the pandemic | Current evidence indicated that the role of excessive weight and weight gain in paediatrics clinical existed during the COVID-19 pandemic in children and adolescents. |
| Jovanovich, G.K., *et al*., 2021[25] | Nutrition knowledge contributes to nutritional status changes, habits, and lifestyle. | Isolation during COVID-19 increased the proportion of overweight and obesity among school children, reduced their physical activity, spent more time using digital media, and revealed a potential mental health problem |

## DISCUSSIONS

Secondary data analysis from Global Burden Disease 2019 exhibited that the COVID-19 pandemic increased malnutrition, particularly among vulnerable groups, children and women.[3,22] The co-existence of obesity and undernutrition was accumulated in this pandemic.[25] The countries with the existing problem of malnutrition have more implications for public health issues and should define the appropriate strategy to solve the problem.[1] The magnitude of the malnutrition problem can be assessed using some public health indicators, i.e., child growth failure, high body mass index (BMI), and years lived with disability (YLD) attributed to micronutrient deficiencies.[1]

Being stunted in early life might disrupt productivity, health, and cognitive performance.[18] Poor families with low socioeconomic status, no access to a health facility, and sanitation and hygiene would amplify the vulnerability of stunting children.[3,9,18] The COVID-19 pandemic exposed more children to poor environment families that hardly provided healthy meals for growth and development.[9] Admission to hospitalized children during the pandemic was higher than before the outbreak. A study in Bangladesh revealed that the most common symptoms are dehydration, convulsions, severe sepsis or septic shock, hypernatraemia, and high creatinine level.[20] For those who lost their parents due to pandemics, the burden was higher than others in accessing adequate facilities to support health.[18] The low coverage of breastfeeding also decreased since self-isolation affected the growth and development of the infant.[19] Having an anxiety disorder would deteriorate the sleeping disorder among children, which would hamper growth and development.[21]

Limited access to health services for primary care services delayed the vaccination program and reduced coverage.[26] This condition encouraged establishing mobile community services to cover the maternal and child health program.[27] Improving public services might also contribute to the alleviation of the stunting reduction program. The water, sanitation, and hygiene (WASH) program determined the children's mortality and other health outcomes, including stunting. Access to clean water and good sanitation significantly diminished the prevalence of diarrhoea, one of the diseases associated with stunting. The reduction of training of the community health cadres to carry out the program would alleviate the health services. Door-to-door services would assist those who need the benefits and retract the reluctant to community health services. Extension health cadres would benefit the community-health program in malnutrition

management and screening at the community level.

Children from wealthy families tend to catch the growth as expected. Some tend to shift the dietary pattern to dense energy-low nutrients and less physical activity to compensate for self-isolation and mental health problems.[23,25] School shutdown, virtual class, and self-isolation lessen the exercise and physical activity of children and adolescents; mainly, they engage with electronic gadgets to spend daily activity.[23]

COVID-19 pandemic hit the financial crisis caused, irritated the economy, pushed the workers' lay-offs, and escalated poverty. The budget allocation for immediate pandemic handling and safety net program was aimed to diminish poverty, reduce income and financial resources and limit access to qualified food and health facilities.[9] Welfare approaches like a cash-transfer program could benefit the eradication stunting program since it could encourage the families to spend the aid for daily consumption.[28] Food security related to providing a nutritious meal for the family member. The food security problem might be found at the national, community, and family levels.[29] Before the pandemic, almost 700 million people, suffered from hidden hunger and were exposed to supply chain-agriculture vulnerability.[30]

They ceased education programs because the institutions shuttered the learning process due to physical distancing and restrictions on gathering.[17] COVID-19 has limited the plan for reducing adverse maternal and child health effects since the school nutrition program's interruption existed in LMICs. The school closure has reduced physical activity and exercise among the children.

Indonesia has been up against under and over-nutrition problems and is committed to accelerating nutrition improvement in the first 1000 days of life (1000 HPK). Indonesia also applied specific and sensitive intervention programs to define the direct-indirect causes and long-term management. The specific intervention includes iron-folic acid (IFA) and vitamin A supplementation, exclusive breastfeeding, weaning food, fortified product including iodine, and several campaigns for pregnant mothers, infants, and children. The sensitive intervention program emphasized increasing the knowledge related to nutrition and food processing.[31] By the end of 2021, the Ministry of Health Republic Indonesia reported that the prevalence of stunting among under-five-year-old children across Indonesia was 24.4 percent, while obesity was 3.8 percent.[13]

The strength of this paper was focused on the children during the COVID-19 pandemic because most of them were asymptomatic and less extensively discussed. It is crucial to design a mitigation program to reduce the adverse effect of the pandemic among vulnerable groups, including children. The weakness of this paper was not enriched with the intervention program to dimmish the malnutrition problem. The restriction for travelling and gathering with others limited the mobility to collect and observe the population.

COVID-19 could be as momentum to address and prioritize the public health problem and evaluate the existing program and funding agencies to support and restrategize the government program. It is fundamental to understand the impact of the pandemic on child growth and development to prevent damage and promote proper growth.[12] The resilience in managing the pandemic would benefit the children's and caregivers' mental health. Improving the quality of public services would be one of the solutions for a vulnerable group. Intervention programs for marginalized households may include the safety net, cash transfer, and community sanitation facility to ensure the appropriate facility.[3]

Formulating nutrition education and knowledge would be convenient for the authority to launch the program.[24,25] As a campaign to reduce the risk of infectious disease, breastfeeding promotion among children needs to be reinforced. The pandemic emerged the importance of nutrition education for the target population since the risk for each group might not be similar.[32]

## CONCLUSION AND RECOMMENDATION

### Conclusion

The findings on the collected references declared some factors related to the co-existence of under and over-nutrition during the COVID-19 pandemic: socioeconomic status, dietary intake, sanitation and hygiene, access to the health facility, and self-isolation condition.

Therefore, in designing intervention programs, the appropriate and applicable content for the vulnerable groups should consider those variables mentioned above in handling the impact of the pandemics.

**Recommendations**

The government could learn from the exemplary countries in managing the malnutrition problem by delivering a comprehensive program involving many stakeholders and scheduled monitoring to ensure the goal is alleviating the public health problem.

## CONFLICT OF INTEREST

The author declared no conflict of interest related to this study.

## ACKNOWLEDGEMENT

This research was funded by the Directorate General of Higher Education, Research and Technology, Ministry of Education, Culture, Research, and the Technology Republic of Indonesia through Penelitian Disertasi Doktor scheme no. 010.22/LP/UG/III/2018.

## REFERENCES

1. Mertens E, Penalvo JL. The Burden of Malnutrition and Fatal COVID-19: A Global Burden of Disease Analysis. *Front Nutr.* 2020;7:619850.
2. Headey D, Heidkamp, R., Osendarp,S., Ruel, M., Scott, N., Black, R., Shekar, M., Bouis, H., Flory, A., Haddad, L., Walker,N., . Impacts of COVID-19 on childhood malnutrition and nutrition-related mortality. *Lancet.* 2020;396:519-520.
3. Akseer N, Kandru G, Keats EC, Bhutta ZA. COVID-19 pandemic and mitigation strategies: implications for maternal and child health and nutrition. *Am J Clin Nutr.* 2020;112(2):251-256.
4. Zar HJ, Dawa J, Fischer GB, Castro-Rodriguez JA. Challenges of COVID-19 in children in low- and middle-income countries. *Paediatr Respir Rev.* 2020;35:70-74.
5. Jia P, Liu, L., Xie, X., Yuan, C., Chen, H., Guo, B., Zhou, J., Yang, S. Changes in dietary patterns among youths in China during COVID-19 epidemic: The COVID-19 impact on lifestyle change survey (COINLICS). *Appetite.* 2021;158:105015.
6. Khoo EJ, Lantos JD. Lessons learned from the COVID-19 pandemic. *Acta Paediatr.* 2020;109(7):1323-1325.
7. UNICEF, UNDP, Prospera a, SMERU. Analysis of the Social and Economic Impacts of COVID-19 on Household and Strategic Policy Recommendations for Indonesia. In. Jakarta 2021.
8. Millward DJ. Nutrition, infection and stunting: the roles of deficiencies of individual nutrients and foods, and of inflammation, as determinants of reduced linear growth of children. *Nutr Res Rev.* 2017;30(1):50-72.
9. Jawaldeh AA, Doggui, R., Borghi, E., Aguenaou, H., Ammari, L.E., Abul-Fadl, A., McColl, K. Tackling Childhood Stunting in the Eastern Mediterranean Region in the Context of COVID-19. *Children.* 2020;7(11):239.
10. Maestre M, Thorpe, J., Guijt, G. The Scaling Up Nutrition (SUN) Movement, Indonesia. In. The Netherlands: Institute of Development Studies and Wageningen Research. 2018.
11. Heidkamp RA, Piwoz E, Gillespie S, et al. Mobilizing evidence, data, and resources to achieve global maternal and child undernutrition targets and the Sustainable Development Goals: an agenda for action. *The Lancet.* 2021.
12. Araújo LAD, Veloso CF, Souza MDC, Azevedo JMCD, Tarro G. The potential impact of the COVID-19 pandemic on child growth and development: a systematic review. *Jornal de Pediatria.* 2021;97(4):369-377.
13. MoH. Hasil SSGI Tahun 2021 Tingkat Kabupaten Kota. In. Jakarta: Kementrian Kesehatan; 2021.
14. Nicodemo M, Spreghini MR, Manco M, Wietrzykowska Sforza R, Morino G. Childhood Obesity and COVID-19 Lockdown: Remarks on Eating Habits of Patients Enrolled in a Food-Education Program. *Nutrients.* 2021;13(2).
15. Kim ES, Kwon Y, Choe YH, Kim MJ. COVID-19-related school closing aggravate obesity and glucose intolerance in pediatric patients with obesity. *Sci Rep.* 2021;11(1):5494.
16. Jennsen BP, Kelly, M.K., Powell, M., Bouchelle, Z., Mayne, S.L., Fiks, A.G. COVID-19 and Changes in Child Obesity. *Pediatrics.* 2021;147(5):e2021050123.
17. Kang HM, Jeong DC, Suh BK, Ahn MB. The Impact of the Coronavirus Disease-2019 Pandemic on Childhood Obesity and Vitamin D Status. *J Korean Med Sci.* 2021;36(3):e21.
18. Bridgman G, Von Fintel D. Stunting, double orphanhood and unequal access to public services in democratic South Africa. *Economics & Human Biology.* 2021:101076.
19. Jácome Á, Castañeda-Orjuela C, Barahona N. Indirect effects of the SARS CoV-2 pandemic on

the prevalence of breastfeeding: Modeling its impact. *Biomédica.* 2021;41(Sp. 2):118-129.
20. Nuzhat S, Hasan, S. T., Palit, P., Afroze F, Amin, R.,Alam, M. A., Alam B, Chisti, M. J.,Ahmed, T. Health and nutritional status of children hospitalized during the COVID-19 pandemic, Bangladesh. *Bull World Health Organ.* 2022;100(2):98-107.
21. Fidanci I, Aksoy H, Yengil Taci D, Fidanci I, Ayhan Baser D, Cankurtaran M. Evaluation of the effect of the COVID-19 pandemic on sleep disorders and nutrition in children. *Int J Clin Pract.* 2021;75(7):e14170.
22. Panthi B, Khanal P, Dahal M, Maharjan S, Nepal S. An urgent call to address the nutritional status of women and children in Nepal during COVID-19 crises. *Int J Equity Health.* 2020;19(1):87.
23. Ostermeier E, Tucker P, Clark A, Seabrook JA, Gilliland J. Parents' Report of Canadian Elementary School Children's Physical Activity and Screen Time during the COVID-19 Pandemic: A Longitudinal Study. *Int J Environ Res Public Health.* 2021;18(23).
24. Cena H, Fiechtner L, Vincenti A, et al. COVID-19 Pandemic as Risk Factors for Excessive Weight Gain in Pediatrics: The Role of Changes in Nutrition Behavior. A Narrative Review. *Nutrients.* 2021;13(12).
25. Kendel Jovanovic G, Dragas Zubalj N, Klobucar Majanovic S, et al. The Outcome of COVID-19 Lockdown on Changes in Body Mass Index and Lifestyle among Croatian Schoolchildren: A Cross-Sectional Study. *Nutrients.* 2021;13(11).
26. Masresha BG, Luce, R., Shibeshi, M.E., Ntsama, B., N'Diaye, A., Chakauya, J., Roy, A., Mihigo, R. The performance of routine immunization in selected African countries during the first six months of the COVID-19 pandemic. *PAMJ.* 2020;37:1-12.
27. Kazi AM, Ahsan N, Mughis W, et al. Usability and Acceptability of a Mobile App for Behavior Change and to Improve Immunization Coverage among Children in Pakistan: A Mixed-Methods Study. *Int J Environ Res Public Health.* 2021;18(18).
28. Manley J, Gitter S, Slavchevska V. *How Effective are Cash Transfer Programmes at Improving Nutritional Status?. A Rapid Evidence Assessment of Programmes' Effects on Anthropometric Outcomes.* London: London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London;2012.
29. Zurayk R. Pandemic and Food Security: A View from the Global South. *Journal of Agriculture, Food Systems, and Community Development.* 2020:1-5.
30. Fan S, Teng P, Chew P, Smith G, Copeland L. Food system resilience and COVID-19 – Lessons from the Asian experience. *Global Food Security.* 2021;28.
31. Kemenkes. Warta Kesmas: Cegah Stunting Penting. 2018;II.
32. Iqbal A, Burrin C, Aydin E, Beardsall K, Wong H, Austin T. Generation COVID-19 - Should the foetus be worried? *Acta Paediatr.* 2021;110(3):759-764.