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Micronutrient Intake of Low-Income Population during Covid -19

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Abstract:

The survey conducted in Mumbai among low-income workers sheds light on the nutritional challenges faced by this population, emphasizing the critical role of diet in immune health. Findings reveal suboptimal intake of essential macronutrients and micronutrients, with deficiencies in zinc, selenium, iron, and various vitamins that can compromise immune responses. Notably, these deficiencies heighten susceptibility to infections, including COVID-19. The study underscores the need for increased awareness and targeted interventions to improve dietary habits and nutrient intake among low-income groups. Socioeconomic factors, including income and education, play a crucial role in dietary choices, impacting overall quality of life. As the COVID-19 pandemic disrupts food systems and exacerbates economic disparities, addressing root causes such as poverty and implementing supportive government policies becomes imperative for enhancing the nutritional status and well-being of vulnerable populations.

Keywords: Nutrients, Micronutrients, Low-Income Population, Effect on immune system, Diet and Health, COVID-19 pandemic.

Introduction:

COVID-19 doesn't just impact health; it also affects food and nutrition, hitting communities differently based on their existing conditions and resilience. The virus can make things worse by weakening immune systems, especially in those who are already struggling. The hardest hit are often the poorest and most vulnerable, like migrants, displaced people, and those in conflict areas. The pandemic worsens the situation by

causing job losses, income reductions, and higher food prices. This puts extra pressure on those who can least afford it. Government measures, like curfews and shutdowns to control the virus, lead to more job losses and increased poverty, especially among low-income and vulnerable groups. COVID-19 affects food systems directly by disrupting supply and demand. Indirectly, it reduces people's ability to buy and produce food, and adds more responsibilities, particularly for those already struggling. All these factors combine to create a challenging situation, hitting the poor and vulnerable the hardest.

Review of Scenario:

The global poverty scenario reveals that 71% of the world's population, approximately three billion people, live on $10 or less a day. This is particularly prevalent in low- and middle-income countries in Asia, Africa, and Latin America. In India, despite progress in reducing extreme poverty, 5% of its 1.3 billion population still lives in extreme poverty. The COVID-19 pandemic has exacerbated the situation, putting around 400 million informal economy workers at risk of falling deeper into poverty. Trends indicate a decrease in global extreme poverty since 1990, but challenges persist, especially in India, where about 22% of the population is still considered poor. The economic condition of low-income populations in India remains a concern, with approximately 23.6% living below $1.25 per day, based on purchasing power parity.

COVID-19's impact on food - supply demand and the Diet:

COVID-19's impact on food - supply, demand, and access further compounds these issues. Disruptions in supply chains, panic buying, and containment measures have immediate and long-term consequences, particularly affecting low-wage and casual workers. The pandemic also alters food demand patterns, leading to job losses and income reductions. Improper diets contribute to malnutrition, especially in resource-poor nations like India, where a significant portion relies on a diet lacking in essential micronutrients. The pandemic exacerbates these challenges, emphasizing the complex and long-term nature of addressing nutrition issues, particularly in the context of rising incomes. In summary, the global and Indian low-income populations face persistent poverty, exacerbated by the ongoing pandemic, which has multifaceted impacts on food security, nutrition, and economic well-being.

Role of Nutrition:

Nutrition is crucial in the COVID-19 response and recovery due to its foundational role in building immunity, preventing illness, and aiding recovery. Prioritizing proper nutrition, including breastfeeding, is essential for individual and community resilience. Healthy diets bolster immunity, mitigating the risk of non-communicable diseases associated with severe COVID-19 outcomes. Safeguarding food and nutrition security is imperative to prevent a crisis amid the pandemic, especially for the poor and vulnerable. Immediate, uninterrupted nutrition interventions are vital for child survival, health, and development, as even short-term disruptions can have irreversible consequences. Adapting programs for safe and sustainable delivery is essential to ensure ongoing nutritional support. Malnutrition effects on the immunity system.

Micronutrient and Low-Income population:

Low-income populations in India face significant micronutrient deficiencies, with studies indicating intake well below recommended levels. Calcium and vitamin A intake among men and women often falls below 70% of the recommended daily allowances (RDA). Pregnant women, particularly in slum areas, exhibit deficiencies in zinc, magnesium, iron, and folate, affecting 30-50% of cases. Iron Deficiency Anemia (IDA) prevalence exceeds 90% in some states among pregnant and lactating women. Poor pre-pregnancy diets contribute to intra-uterine growth retardation, emphasizing the importance of micronutrient-rich foods. Following table 1 shows that nutrients and their sources. Adequate **vitamin A** intake is crucial for skin, respiratory, and gut health, emphasizing the significance of balanced diets rich in diverse nutrients. **Vitamins C and E** are useful for fighting an infection, it experiences what's called oxidative stress. **Vitamin D** is crucial for immune function, aiding immune cells in combating infection. While sunlight exposure is a natural source, fortified foods like eggs and fish contribute to intake. Deficiency can be addressed with supplements, proven effective in protecting against acute respiratory infections, especially in those with inadequate vitamin D levels, as indicated by a review of 25 studies. Iron, zinc, and selenium are essential for immune cell growth and function. Iron increases free radicals to kill pathogens and regulates enzyme reactions crucial for immune recognition, while zinc and selenium maintain skin integrity.

Nutrient	**Sources**	**RDA or AI (Adults > 19 yrs**

Vitamin A	Retinol (liver, dairy, fish), carotenoids (sweet potatoes, carrots, spinach	700-900 mcg
Vitamin D	Sunlight, fish oil, milk	600-800 IU
Vitamin E	Sunflower seeds, wheat germ, almonds	15 mg
Vitamin K	Leafy greens, soybeans, pumpkin	90-120 mcg
Vitamin C	Citrus fruits, bell peppers, Brussels sprouts	75-90 mg
Vitamin B	Whole Grains, Meat, Fish	1.0 – 1.2 mg

Table 1- Nutrients and sources

Low Income and Dietary Habits:

In the dietary habits of low-income populations, staple foods like rice and bread dominate, while more than half of families consume green leafy vegetables (GLVs) and fruit less than once a day, falling short of the recommended daily intake by the Indian Council for Medical Research (ICMR). Despite the daily consumption of tea with a small amount of milk, larger servings and milk products are infrequent, possibly due to rising prices. Vitamin and mineral deficiencies persist in developing nations, where staple food availability is not a concern. In India, vitamin A deficiency correlates more strongly with a lack of knowledge than low income, contrasting with economically determined iron deficiency. Poor diets in lower socioeconomic groups primarily impact micronutrient intake through low consumption of fruits and vegetables. While increased income generally leads to improved micronutrient status.

Survey of Low-Income People during Pandemic of Covid-19:

A cross-sectional study was conducted in Mumbai, Maharashtra, India, targeting 50 low-income subjects aged 20-70 years, comprising 27 females and 23 males. The subjects, randomly selected from diverse occupations like watchmen, uber drivers, rickshaw drivers, and delivery boys in Andheri, Versova, Malad, and Borivali, provided consent for the survey. The research aimed to investigate dietary habits and analyze micronutrient intake crucial during the COVID-19 pandemic. The study, carried out from mid-June to end-June 2020, employed a consent letter to ensure participants' willingness before initiating the survey, focusing on a demographic representing the low-income workforce in Western Mumbai Suburbs.

Data Collection and Analysis:

Data collection for the "Micronutrient intake of low-income population during COVID-19" study involved administering a questionnaire through online Google Forms and conducting interviews with low-income workers. Developed under the guidance of mentor Dr. Sulakshana Mane, the survey comprised three sections. Part A gathered general data on respondents, including name, age, gender, family members, and income. Part B delved into dietary habits, exploring food groups, protein sources, preferred foods, dairy choices, and fat consumption. Part C focused on changes in daily meals, appetite, food availability, and body alterations. Participants were assured of anonymity, and their voluntary contributions aimed to raise awareness about nutrition and economic challenges during the pandemic. Data analysis involved a detailed examination of dietary habits, food practices, and a 24-hour dietary recall. Average calorie, protein, carbohydrate, fat, and micronutrient intakes (sodium, potassium, iron, zinc, and vitamin C) were calculated, providing valuable insights for the research.

Discussion:

The study of low-income workers' dietary habits during COVID-19 in Mumbai reveals alarming nutritional deficiencies. Both male and female participants exhibit significantly lower energy, protein, carbohydrate, and fat intake than recommended. Iron, zinc, and vitamin C intake fall considerably below ideal levels, emphasizing widespread micronutrient deficiencies. Despite chronic energy deficiency in a quarter of the population, major food expenditures include cereals, bakery products, and limited fruits and vegetables. COVID-19 exacerbates these challenges through disrupted health services and income losses. Micronutrient deficiencies in Mumbai range from 6.2% to 59.0%, primarily attributed to inadequate diets. The study underscores the urgent need for nutrition education, poverty eradication, and fortification strategies. Social protection measures, healthcare access, and improved food supply chains are crucial for addressing the interconnected challenges faced by low-income populations during and beyond the pandemic. Strengthening universal health coverage and poverty eradication programs is essential for ensuring the well-being of vulnerable communities.

Conclusion:

In conclusion, the survey highlights the critical role of nutrition in shaping the immune response, emphasizing the impact of deficiencies in zinc, selenium, iron, copper, folic acid, and various vitamins on immune function. Notably, poorly nourished individuals are identified as being at a heightened risk of infections, including COVID-19. The study provides valuable insights into the lifestyle, dietary habits, and quality of life of the urban low-income population in Mumbai. Moreover, the study underscores the negative association between quality of life and low income, highlighting the need for interventions targeting dietary behaviors, considering factors like cost and availability. The COVID-19 pandemic further exacerbates challenges, affecting both short- and long-term food availability. Vulnerable populations, particularly the poorest, face increased food insecurity. The root cause of micronutrient malnutrition is identified as poverty and sluggish economic growth, necessitating improved financial literacy and targeted government policies to uplift the socio-economic status of the low-income population.

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