

Critical Review of Breastfed Infants Gut Microbiota Based on Maternal Diets, Lifestyle and Socioeconomics Across Different Asian Populations

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Structured Abstract

Background: The gut microbiota plays a crucial role in early immune development, allergy prevention, and metabolic regulation in infants. It is established during the early stages of life and significantly influenced by maternal and environmental factors. While most microbiota-related studies are based on Western populations, Asia's diverse dietary, cultural, and environmental backgrounds are underrepresented in current literature. The limited focus on Asian-specific variables such as traditional diets, postpartum practices, and urban-rural health disparities restricts the applicability of global recommendations. This review aims to examine how maternal diet, lifestyle, and socioeconomic factors influence gut microbiota development in breastfed infants across different Asian populations, with the goal of supporting culturally relevant health strategies.

Methods: This review applied a mixed-method critical analysis of recent scientific publications from 2019–2024 focusing on gut microbiota in breastfed infants across Asia. Key determinants examined include maternal diet during lactation (fermented foods, fiber-rich vs. high-fat diets), lifestyle (physical activity, BMI), mode of delivery, environmental microbial exposure (urban vs. rural), socioeconomic status, and traditional postpartum practices. Comparative insights were drawn across four representative Asian countries: China, India, Malaysia, and Japan.

Results: Findings suggest that diets rich in fermented foods (e.g., miso, tempeh) and fiber (lentils, tropical fruits) are associated with increased colonization of beneficial bacteria like *Bifidobacterium* and *Lactobacillus*. Conversely, high-fat and processed diets, especially in urbanized areas, correlate with reduced microbial diversity. Rural settings offer greater natural microbial exposure, while urban living and over-sanitization limit diversity. Traditional postpartum practices such as *zuo yue zi* (China), *pantang* (Malaysia), and *sankhu* (India) may positively or negatively influence microbial transfer based on dietary and hygiene practices. Maternal BMI, antibiotic use, and socioeconomic status also significantly modulate microbial richness in infants.

Conclusion: This review highlights that maternal diet, cultural practices, and living environment in Asia uniquely shape infant gut microbiota. Understanding these differences can help formulate culturally appropriate dietary and healthcare guidelines to promote healthier gut colonization and reduce long-term risks of obesity, diabetes, and immune diseases in Asian infants.

Keywords: Infant Gut Microbiota, Maternal Diet, Breastfeeding, Asian Populations, Postpartum Practices

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