

Hormesis Deserves a Place in Public Health Messaging

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Dear Editor,

Public health communication often relies on monotonic intuitions: if a little is good, more is better; if something is harmful, less is always safer. I write to argue that the principle of hormesis—where a moderate dose of a stressor is beneficial while too little or too much is not—offers a more accurate frame for several diet and lifestyle exposures and deserves a place in how we communicate.

According to PubMed, a broad analysis of the phytoprotective compound sulforaphane found that it induces biphasic, hormetic dose-responses mediated by Nrf2 activation, and proposed that activation of the Nrf2 pathway is probably a central, underlying mechanism of hormesis itself—an integrative explanation for how many dietary compounds limit age-related damage at low doses. The benefit is tied to the dose being modest.

The same logic appears in exercise physiology. According to PubMed, skeletal muscle exhibits hormesis-like adaptations in which contraction-induced reactive oxygen species act as signals activating NF- κ B, MAPK, and PGC-1 α to drive mitochondrial biogenesis and antioxidant defense—adaptations that depend on the stress being within a beneficial range rather than absent or excessive.

A public-health message built only on “more is better” or “any amount is bad” misrepresents exposures that are genuinely biphasic. It can drive counterproductive behavior—megadosing supplements, fearing all oxidative stress, or assuming that if some exercise is good, extreme volumes carry no cost. A hormetic frame captures the reality that the dose makes the medicine, and that optimal is not maximal.

I am not suggesting hormesis applies universally; many exposures are genuinely monotonic, and the concept can be misused to excuse real hazards. But for diet, physical activity, and related lifestyle factors, communicating the existence of an optimal range—rather than an ever-rising or ever-falling line—would improve public understanding. I encourage the field to incorporate this nuance into health messaging where the evidence supports it.

Sincerely,
Mueen Ahmed KK

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