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Perspective article

Sugar-sweetened beverages and oral health in Taiwan: An emerging public health challenge

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Taiwan's iconic bubble tea culture is both a national treasure and a growing public health concern. Sugar-sweetened beverages (SSBs), including sweetened teas, coffees, sodas, and energy drinks, have become a major dietary contributor to added sugar intake in the Taiwanese diet, especially among adolescents.[1] These beverages are central to the rise of non-communicable diseases (NCDs) such as obesity, type II diabetes, and oral diseases like dental caries and periodontitis.

Longitudinal data from the Nutrition and Health Survey in Taiwan showed an alarming trend: over 99 % of adolescents reported SSB consumption in the past week, with sweetened tea being the most frequently consumed variety.[1] Between 1993 and 2011, intake of sweetened tea and coffee increased significantly, while soda consumption declined slightly.[2] This reflects a shift in beverage preferences shaped by aggressive marketing, widespread accessibility, and deeply embedded social habits. Nowadays Taiwan's handmade beverage industry has ballooned into a US$3.3 billion market.[3]

The consequences extend beyond caloric excess. Adolescents with high SSB intake exhibit poorer dietary quality, including higher carbohydrate, lower protein, and micronutrient intake.[2] Importantly, a higher frequency of SSB consumption was significantly associated with current smoking, irregular meal intake, and higher chance of being hyperuricemic, a known marker of metabolic risk.[2] These behaviors cluster to form high-risk profiles that track into adulthood, remaining an important public health challenge of NCDs.

Oral diseases are also tightly linked to SSB consumption. These beverages promote microbial dysbiosis in the oral cavity, enriching acidogenic and acid-tolerant species such as *Streptococcus* and *Lactobacillus*, which contribute to dental caries and potentially increase the risk for periodontal inflammation.[4] These diseases are highly prevalent and frequently co-occur with systemic conditions such as metabolic syndrome, reflecting shared risk factors like diet and inflammation.[5]

According to Taiwan government surveillance, the permanent tooth caries rate among children and adolescent has plateaued in recent years despite early improvements, while over 80 % of adults suffer from some degree of periodontal disease.[6] In parallel, obesity prevalence has risen steadily: among adult men, the rate of overweight and

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obesity combined increased from 33.2 % in 1993—1996 to 50.6 % in 2017—2020, with young men (19—44 years old) obesity nearly reach 29.6 % over the same period.[7] These worsening trends might point to dietary shifts including sustained SSBs consumption that have not yet to be met with proportionate public health countermeasures.

Taiwan's current nutrition labeling system fails to adequately address this growing crisis. A survey of 341 packaged SSBs in Taipei revealed that 70 % exceeded the Chilean threshold for high sugar content (>5 g/100 mL), and over 40 % surpassed the World Health Organization recommendation for daily intake of 25 g of added sugar per portion.[8] Crucially, many labels are based on unrealistic serving sizes rather than total package volume, misleading consumers. Taiwanese consumers currently lack front-of-package warning labels for sugar content-a policy tool that has shown promising results in countries like Chile and Mexico in reducing SSB purchases.[8] Although cultural and market contexts differ, adopting similar labeling strategies in Taiwan might help improve consumer awareness and promote healthier choices.

Public attitudes, however, show readiness for change. A national survey of 1617 Taiwanese adults found that 60 % support a sugar tax, and 47 % believe it would reduce SSB intake.[3] Support was higher among individuals aware of SSB-related health risks and those who accepted personal responsibility for dietary choices. These insights echo international findings that risk perception and self-efficacy are key drivers of public acceptance of health policy.[3] Recent global evidence also supports the association between habitual SSB consumption and heightened risk for type II diabetes, independent of adiposity, reinforcing the urgency for population-level interventions.[9]

While Taiwan has made progress through voluntary sugar reduction targets and education campaigns, these measures alone are insufficient. Obesity is now recognized as a chronic relapsing disease and a major NCD driver in Taiwan, with prevalence reaching 28.4 % in adult men and 19.6 % in adult women.[7] Periodontitis, similarly, contributes to systemic inflammation and has been linked to adverse metabolic outcomes, including poor glycemic control and dyslipidemia.[10] The rising burden of obesity, type II diabetes, and oral diseases underscores the need for structural interventions. Addressing SSB consumption therefore serves as an unifying intervention point for multiple NCDs.

In conclusion, Taiwan faces a silent epidemic driven in part by its cultural affinity for sweetened beverages. Recognizing SSBs as a shared risk factor for multiple NCDs provides a powerful rationale for comprehensive, coordinated policy action. Implementing a SSB tax, alongside mandatory front-of-package warning labels, and school-based education, could be the next step toward health equity and sustainable NCD prevention. By integrating global and local evidence, Taiwan has the opportunity to lead in Asia with an innovative model for SSB regulation and population health promotion. In addition, dentists should be at the forefront to curb high SSB consumption.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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