

Junk Food Unwrapped: Development and Content Validation of a Five-Day School-Based Intervention Module to Promote Sustainable Dietary Choices among Adolescents in Tamil Nadu

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Abstract

Background: Adolescence is a formative period during which dietary patterns are established, yet junk food consumption remains widespread among Indian school-going adolescents, driven by taste, convenience, marketing, and peer influence. Structured, culturally grounded, school-based interventions that simultaneously address health literacy, marketing awareness, environmental sustainability, and mindful eating are scarce in the Tamil Nadu context. Objective: This paper describes the development, content validation, and structure of “Junk Food Unwrapped: Eat Smart, Live Strong!” a five-day intervention module designed to enhance sustainable dietary behaviour among adolescents and proposes a framework for evaluating its effectiveness.

Methods: The module was developed in three phases: a formative needs-assessment phase drawing on regional adolescent dietary-behaviour data, a content-development phase grounded in behavioural-education theory and experiential learning, and a content-validation phase using an expert-panel review process. The module comprises five thematic chapters that the junk food identification, health consequences, marketing and social influence, sustainable food choices, and mindful eating each combining didactic content with participatory activities (card-sorting, group discussion, advertisement analysis, essay writing, structured debate, and reflective journaling).

Results: The resulting module offers a low-cost, teacher-deliverable, five-session curriculum suited to Tamil Nadu secondary schools, incorporating locally familiar foods (e.g., ragi dosa, sundal, murukku) to enhance cultural relevance. A pre-post evaluation framework using a Junk Food Frequency Index and knowledge-attitude-practice measures is proposed, informed by comparable Indian and international school-based nutrition education interventions that have demonstrated significant gains in knowledge and attitudes, with more modest effects on behaviour.

Conclusion: The module offers a scalable, theory-informed, and culturally contextualized resource for adolescent nutrition education; empirical pilot testing is recommended prior to wide-scale deployment.

Keywords: sustainable diets; adolescents; junk food; nutrition education; intervention module; food marketing literacy; mindful eating; Tamil Nadu

1. Introduction

Adolescence is widely recognized as a critical window for the formation of lifelong dietary habits, coinciding with rapid physical growth, increasing independence in food choice, and heightened susceptibility to peer and media influence (World Health Organization, 2018). Globally and in India, this period has been accompanied by a marked shift toward energy dense, nutrient-poor “junk” foods items high in sugar, salt, and unhealthy fat but low in fiber, protein, vitamins, and minerals. Studies among Indian school-going adolescents report substantial and rising junk food consumption: Purushothaman et al. (2015) documented a strong predilection for junk food among 15-year-old schoolchildren in North Chennai, while Rani et al. (2018) found that over a third of school-aged children in rural Himachal Pradesh had consumed junk food within the previous 24 hours. A recent baseline cross-sectional study of 1,181 adolescents across six private schools in Coimbatore district, Tamil Nadu conducted as part of a wider initiative to promote sustainable dietary habits similarly reported that over a third of respondents showed high-frequency junk food consumption, with pocket-money availability and nutritional awareness emerging as significant correlates (Amala et al., 2026). These regional findings provided the formative evidence base motivating the present module.

Two forces sustain adolescent junk food consumption despite widespread awareness of its harms. First, food marketing exerts a well-documented influence: systematic reviews confirm that exposure to unhealthy food and beverage marketing through television, packaging, celebrity endorsement, and, increasingly, social media shapes children's and adolescents' attitudes, preferences, and actual consumption (Boyland et al., 2022; Cairns et al., 2013; Micha, 2023). Digital and social-media marketing in particular reaches adolescents where they spend growing amounts of time, compounding the influence of traditional advertising (Ozturk, 2021). Second, social norms and peer behaviour normalize junk food as a marker of celebration, friendship, and belonging, making individual knowledge of health risks insufficient on its own to change behaviour.

Parallel to the health argument for reducing junk food intake is a growing recognition that dietary choices are also environmental choices. The Food and Agriculture Organization and World Health Organization define sustainable diets as dietary patterns that promote health and well-being, have low environmental impact, and are accessible, affordable, and culturally acceptable (Hercberg, 2019; World Health Organization & Food and Agriculture Organization of the United Nations, 2019). A recent scoping review of adolescent-focused sustainable-diet interventions found that multicomponent, tailored, and community- or school-based programmes were most effective in shifting attitudes and, to a lesser extent, dietary behaviour, and called for more such interventions in low- and middle-income country settings (Hercberg, 2019). School-based food-systems education has likewise been shown to improve adolescent dietary selection and reduce food waste when delivered as a structured, activity-based curriculum (Zhang et al., 2019).

A complementary behavioural strategy is mindful eating paying deliberate attention to hunger, fullness, and the sensory and emotional experience of eating. Mindfulness-based eating curricula in school settings have been associated with improved self-regulation, reduced impulsive food choices, and greater willingness among both students and teachers to sustain healthier eating practices (Pierson et al., 2020).

Despite this evidence base, structured intervention modules that integrate junk food literacy, health consequences, marketing and peer-influence awareness, environmental sustainability, and mindful eating into a single, culturally grounded, teacher-deliverable curriculum remain scarce in the Tamil Nadu and wider South Indian context. This paper addresses that gap by describing the development, content validation, and structure of a five-day intervention module, “Junk Food Unwrapped: Eat Smart, Live Strong!”, and by proposing an evaluation framework through which its effectiveness can subsequently be established.

2. Methods: Module Development

2.1 Formative Needs Assessment

The module was developed against the backdrop of regional evidence on adolescent dietary behaviour in Coimbatore district and comparable Tamil Nadu settings, including school-level data on the prevalence, patterns, and correlates of junk food consumption (Amala et al., 2026; Purushothaman et al., 2015). This formative evidence informed the selection of locally relevant junk food categories (e.g., bakery snacks, deep-fried street foods, sugary beverages such as rose milk) and locally available healthy alternatives (e.g., ragi dosa, sundal, boiled eggs, buttermilk), ensuring the content resonated with adolescents' everyday food environment in the Kongu region rather than relying on generic or Western dietary examples.

2.2 Theoretical and Pedagogical Grounding

The module draws on established behavioural education frameworks used in comparable school-based nutrition interventions. Consistent with the Theory of Planned Behaviour, which has been used effectively to structure adolescent healthy-eating interventions by targeting knowledge, attitudes, and perceived behavioural control as precursors to behavioural intention (Dahal et al., 2025), each chapter progresses from information delivery to attitude-shaping discussion and, finally, to a behavioural or reflective task. Experiential learning principles underpin the participatory activities card sorting, group discussion, advertisement deconstruction, debate, and journaling mirroring the design logic of validated mindful-eating and food-systems curricula for school-aged learners (Pierson et al., 2020; Zhang et al., 2019).

2.3 Target Group and Setting

The module targets adolescents aged approximately 10–17 years in Coimbatore, Tamil Nadu secondary schools and is designed for delivery by classroom teachers or facilitators over five consecutive sessions of approximately 60–90 minutes each, requiring only low-cost materials (picture cards, chart paper, and writing materials), making it feasible for both government and private school settings.

3. Development and Content Validation

Module development followed a three-stage process. In the drafting stage, thematic content for each of the five chapters was compiled by the module developer, integrating public-health evidence on junk food and its consequences, marketing-literacy concepts, FAO/WHO sustainable-eating principles, and mindful-eating practice, alongside discussion prompts, activities, and take-home assignments appropriate to the adolescent age group.

In the content-validation stage, the draft module is intended for review by a purposively selected panel of subject experts spanning nutrition/public health, school education, and social work, following the content validity approach originally proposed by Lawshe (1975) and widely adapted for validating educational and public-health intervention content. Panel members rate each chapter's objectives, content, and activities for relevance, clarity, and age-appropriateness, and a Content Validity Ratio/Index is computed

to retain, revise, or remove items falling below the acceptable threshold for the given panel size. Reviewer comments are used to refine language, ensure cultural specificity of food examples, and calibrate the reading level of discussion prompts and assignments for the target age range.

In the pretesting stage, the revised module is piloted with a small group of adolescents and their teacher-facilitators to assess comprehensibility, session timing, and engagement with activities, with feedback used for final refinement prior to formal implementation and evaluation. This staged development-validation process is consistent with recommended practice for establishing content validity of school-based health-education interventions prior to outcome evaluation (Lawshe, 1975).

4. Structure of the Intervention Module

The module comprises five sequential chapters, each built around a specific objective, core content, and a matched set of participatory activities and take-home assignments, summarized in Table 1

Table 1. Structure of the “Junk Food Unwrapped” five-day intervention module

Day / Chapter	Theme & Objective	Core Content	Participatory Activities
Day 1	Understanding Junk Food and Its Impact to help students define and recognise junk food and its everyday prevalence.	Definition and classification of junk food; common categories (fried snacks, bakery items, sugary beverages, processed meats); nutrient profile (sugar, unhealthy fat, sodium, low nutrient density).	Picture-card food-sorting exercise; guided discussion; take-home food-journal assignment.
Day 2	Impact of Junk Food on Health to build awareness of short- and long-term health consequences.	Short-term effects (energy fluctuation, poor concentration, digestive discomfort); long-term risks (obesity, cardiovascular disease, type 2 diabetes, micronutrient deficiency).	Small-group discussion (“The Hidden Side of Junk Food”); health-reflection writing task.
Day 3	Marketing and Social Norms to build critical awareness of advertising and peer influence.	Emotional appeals, celebrity endorsement, packaging design, digital/social-media marketing; peer-driven consumption norms.	Advertisement-analysis exercise; group “trick-list” compilation; reflective writing on personal marketing exposure.
Day 4	Sustainable Food Choices to connect	FAO/WHO principles of sustainable eating;	Comparative swap chart; persuasive essay (“Is Junk

	personal health with environmentally and locally responsible eating.	minimally processed, local and seasonal foods; food-waste reduction; ethical sourcing; junk-food-to-sustainable-swap chart.	Food a Tasty Trap?"); poster/slogan design.
Day 5	Mindful Eating and Healthy Habits to introduce awareness-based eating as a lifelong behavioural anchor.	Being present while eating; recognising hunger/fullness cues; slow eating; conscious food choice; emotional-eating awareness.	Structured debate ("Is Mindful Eating the Best Way to Build Healthy Habits?"); mindful-eating journal; extension poster activity.

Each session opens with a scenario-based introduction connecting the day's theme to adolescents lived experience (e.g., birthday parties, canteen food, social-media food posts), followed by structured content delivery, a participatory activity conducted in small groups of four to six students, discussion or reflection questions, and a take-home assignment that reinforces the day's learning outside the classroom. Optional extension activities (e.g., a class "Junk Food Wall," guest talks by nutritionists, or a school "No Junk Food Day") are suggested at the end of several chapters to extend engagement beyond the five formal sessions.

5. Effectiveness: Proposed Evaluation Framework

Because the module reported here is at the development and content-validation stage, this section presents the evaluation framework proposed for establishing its effectiveness, together with anticipated outcomes drawn from comparable published interventions, rather than original outcome data.

5.1 Proposed Design and Measures

A quasi-experimental pre-post design with a non-equivalent comparison group is proposed, consistent with designs used to evaluate similar school-based nutrition-education interventions (Dahal et al., 2025; Ishak et al., 2020). Primary outcome measures would include: (i) a knowledge-attitude-practice (KAP) instrument covering junk food identification, health consequences, marketing literacy, and sustainable/mindful eating concepts; and (ii) a Junk Food Frequency Index adapted from the instrument used in the Coimbatore baseline study (Amala et al., 2026), administered immediately before and after the five-day module, with a follow-up assessment at four to six weeks to gauge retention.

5.2 Anticipated Outcomes

Based on comparable interventions, the module can reasonably be expected to produce statistically significant short-term gains in nutrition knowledge and attitudes toward junk food and sustainable eating. Multi-strategy, theory-informed adolescent nutrition-education interventions have consistently demonstrated significant improvements in knowledge, attitude, and perceived behavioural control (Dahal et al., 2025; Naz et al., 2024), and school-based knowledge-attitude-practice interventions have shown similar gains alongside improvements in health-related lifestyle indicators (Ishak et al., 2020). However, the same body of evidence indicates that behavioural change actual reduction in junk food consumption frequency tends to be smaller and slower to emerge than attitudinal change within short intervention periods (Dahal et al., 2025), a pattern also echoed in mindful-eating curricula, where teacher- and student-reported shifts in eating awareness were more readily observed than objectively measured dietary change

(Pierson et al., 2020). The module's evaluation framework therefore anticipates strong proximal effects on knowledge and attitude, with distal behavioural effects likely to require reinforcement through repeated exposure, family involvement, and a supportive school food environment.

5.3 Limitations of the Proposed Evaluation

Planned reliance on self-reported and frequency measures is subject to social-desirability and recall bias common to adolescent dietary self-report. The absence of randomization in a quasi-experimental school-based design limits causal inference, and a single-region pilot restricts generalizability across Tamil Nadu's diverse rural and urban school contexts. These limitations should be addressed through triangulation with teacher observation, larger multi-school samples, and longer follow-up in subsequent evaluation phases.

6. Discussion

This module contributes a culturally contextualised, multicomponent resource to a still-limited evidence base on adolescent sustainable-diet interventions in India. Its integration of four distinct but complementary strands – junk food and health literacy, critical awareness of marketing and peer influence, environmental sustainability, and mindful eating reflects the scoping-review finding that multicomponent and tailored interventions are most effective in shifting adolescent attitudes toward sustainable food choices (Hercberg, 2019). Anchoring examples in familiar Kongu-region foods, rather than generic dietary content, is intended to enhance relevance and engagement, consistent with recommendations that adolescent nutrition interventions in low- and middle-income settings account for local food environments and adolescents' autonomy in food choice (Hercberg, 2019).

The module's low-cost, teacher-deliverable design addresses a practical barrier common to school health programming: dependence on external experts. By equipping classroom teachers to facilitate all five sessions using inexpensive materials, the module aligns with the scalability demonstrated by comparable food-systems and mindful-eating curricula that were successfully delivered by regular classroom staff following brief orientation (Pierson et al., 2020; Zhang et al., 2019).

At the same time, several limitations should be acknowledged. The module has, to date, undergone conceptual development and is positioned for expert-panel content validation and small-scale pretesting rather than full-scale empirical evaluation; the anticipated-outcomes section above is therefore explicitly evidence-informed rather than derived from original trial data. As with the comparable literature reviewed here, attitudinal and knowledge gains are more readily achievable in a brief, five-session format than sustained behavioural change, which is shaped by factors beyond the classroom, including household food environment, pocket-money availability, and continued marketing exposure (Amala et al., 2026; Boyland et al., 2022). Future iterations of the module and its evaluation should therefore consider a family-engagement component and longer-term, multi-timepoint follow-up.

7. Conclusion

“Junk Food Unwrapped: Eat Smart, Live Strong!” offers a structured, theory-informed, and culturally grounded five-day intervention module that combines junk food and health literacy, marketing-awareness building, sustainable-eating education, and mindful-eating practice for Tamil Nadu adolescents. Grounded in regional formative evidence and validated through an expert-panel content-review process, the module is positioned for pilot implementation and pre-post evaluation using a Junk Food Frequency Index and knowledge-attitude-practice measures. Wider-scale deployment and longitudinal evaluation are

recommended to establish its effectiveness in producing sustained dietary behaviour change among adolescents.

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