“Psychobehavioral mechanisms linking public health policy to consumers’ intention to avoid HFSS foods: A PLS-SEM analysis”

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PSYCHOBEHAVIORAL MECHANISMS LINKING PUBLIC HEALTH POLICY TO CONSUMERS' INTENTION TO AVOID HFSS FOODS: A PLS-SEM ANALYSIS

Abstract

The rapid growth in consumption of foods high in fat, sugar, and salt (HFSS) has intensified public health challenges related to obesity and diet-related non-communicable diseases, prompting governments to adopt regulatory interventions such as fiscal measures, nutrition labeling, and marketing restrictions. However, the behavioral mechanisms through which public health policies translate into consumers' intention to avoid HFSS foods remain insufficiently understood. This study aims to explain the psychobehavioral pathways linking public health policy to consumers' intention to avoid HFSS foods by integrating policy awareness, institutional trust, psychological mediators, and habitual eating patterns. A cross-sectional survey of 300 Indonesian young consumers was analyzed using an advanced Partial Least Squares-Structural Equation Modeling (PLS-SEM) approach, incorporating mediation, moderation, and Importance-Performance Map Analysis (IPMA). The results indicate that HFSS policy awareness significantly enhances perceived policy effectiveness ($\beta = 0.257$) and attitudes toward avoiding HFSS foods ($\beta = 0.749$). At the same time, trust in government strengthens perceived policy effectiveness and attitudes, particularly among consumers with entrenched food habits. Intention to avoid HFSS foods is primarily driven by perceived policy effectiveness ($\beta = 0.564$) and attitudes ($\beta = 0.476$), whereas health risk perception shows no direct effect. The model demonstrates strong explanatory power (R^2 for intention = 0.943). These findings suggest that effective HFSS policies operate not merely through risk communication but by strengthening policy credibility, institutional trust, and positive consumer attitudes, offering critical insights for designing behaviorally effective public health interventions.

Keywords attitude, HFSS policy, perceived policy effectiveness, public health policy, trust in government

JEL Classification I12, I18, D91, H51

INTRODUCTION

The global consumption of foods high in fat, sugar, and salt (HFSS) has increased markedly alongside the rising availability of dietary energy and the growing dominance of ultra-processed foods. Between 2010 and 2022, global per capita energy availability increased, while intakes of free sugars, saturated fats, and sodium consistently exceeded World Health Organization recommendations (FAO, 2024). This dietary transition is closely linked to the escalating prevalence of obesity, type 2 diabetes, and cardiovascular diseases across both high- and middle-income countries, creating substantial challenges for public health systems (Tee & Voon, 2024).

Beyond adverse health outcomes, HFSS consumption generates significant economic and social costs, including rising healthcare expenditures, productivity losses, and long-term fiscal pressures, while also

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widening social inequalities and diminishing quality of life (Pineda et al., 2024). These impacts are reinforced by modern food environments characterized by the widespread availability, affordability, and intensive marketing of HFSS products, particularly through digital platforms and child-targeted advertising (Kininmonth et al., 2025).

In response, public health policies have become key instruments for reshaping food choices. Governments increasingly implement regulatory and fiscal measures, such as sugar taxes, front-of-pack nutrition labeling, advertising restrictions, and school food policies, to curb HFSS consumption (Wallis & Moore, 2023). However, policy effectiveness ultimately depends on consumer perceptions and behavioral responses, underscoring the importance of understanding the mechanisms through which public health interventions influence dietary behavior.

Although public health policies to reduce HFSS food consumption are increasingly implemented, existing evidence largely emphasizes observable outcomes, such as consumption patterns and health indicators, offering limited insight into the behavioral mechanisms underlying consumer responses. Little attention has been given to how individuals perceive, interpret, and internalize such interventions, or why certain policies effectively shape intentions while others yield marginal effects. Avoiding HFSS foods represents intentional self-regulation and preventive behavior influenced by cognitive, emotional, and normative factors. Addressing this theoretical-practical gap, this study explains how public health policies translate into consumers' intention to avoid HFSS foods, thereby advancing understanding of consumer decision-making in regulated food environments and informing the design of more behaviorally effective policies.

1. LITERATURE REVIEW AND HYPOTHESES

Public health policies targeting HFSS foods, including sugar taxes, front-of-pack nutrition labeling, and restrictions on advertising, have been widely implemented across countries to address obesity and diet-related non-communicable diseases. A substantial body of empirical research evaluates the effectiveness of these interventions primarily through changes in consumption patterns and health outcomes. Fiscal measures such as sugar taxes have been shown to reduce purchases of sugar-sweetened beverages and other HFSS products in several countries, including Europe, the United States, Japan, and Chile (Roberts et al., 2017). Regulatory approaches focusing on marketing exposure have also demonstrated measurable effects, with advertising restrictions associated with declines in household purchases of energy, fat, and sugar (Yau et al., 2022). Evidence regarding nutrition labeling is more mixed, as some experimental studies report limited or insignificant effects on attitudes and purchase intentions (Folkvord et al., 2021). While these policies have been linked to improvements in selected health indicators, such as cardiovascular disease risk, their impact on weight-related outcomes remains inconsistent and context dependent (Maniadakis et al., 2013).

This study draws on an integrated set of behavioral and institutional perspectives to explain consumer responses to HFSS-related public health policies. The Theory of Planned Behavior provides a foundational framework for linking attitudes and cognitive evaluations to intentions to avoid unhealthy foods (Ajzen, 1991). Complementarily, the Health Belief Model explains how policy exposure functions as a cue to action by shaping perceived health risks and perceived benefits of regulatory interventions (Daniati et al., 2021). Institutional theory further highlights the role of trust in government in influencing policy acceptance and compliance, while habit theory accounts for the stabilizing effect of established food consumption patterns (Scott, 2005). Together, these perspectives offer a comprehensive lens for understanding how policy, perception, and habitual behavior interact to shape avoidance intentions.

HFSS policy refers to a set of regulatory interventions designed to reduce the consumption of high-fat, sugar, and salt foods through fiscal instru-

ments (taxes and minimum pricing), marketing restrictions, and regulation of product promotion and placement (Gupta & Sachdev, 2022; Jawad et al., 2023). In the context of consumer behavior, HFSS policy awareness is understood as the level of knowledge, understanding, and awareness among individuals regarding the policy's existence, objectives, and mechanisms. This awareness is an important prerequisite for policies to be not only structural, but also cognitively internalized by consumers (Kininmonth et al., 2025).

Conceptually and empirically, HFSS policy awareness directly increases policy effectiveness. Studies show that HFSS policy awareness has been shown to reinforce the perception of policy effectiveness, as consumers who understand advertising and promotion restrictions tend to associate it with decreased exposure and consumption of HFSS (Harris et al., 2025). Awareness also increases health risk perception through understanding the relationship between HFSS and obesity and chronic disease, which further drives policy support (Watson et al., 2017). Besides, policy-conscious consumers showed a more positive attitude toward government intervention, viewing it as structural support for healthy eating choices, not restrictions on freedom (Dhuria et al., 2023; Kininmonth et al., 2025; Muir et al., 2023).

Conceptually, trust in government refers to the public belief that the government acts honestly, competently, and relatively, and is oriented towards the public interest (Ma & Christensen, 2019). In the context of health, these beliefs become more specific, encompassing perceptions of the transparency of risk communication, policy legitimacy, data protection, and the government's capacity to manage public health interventions (Gille, 2022). The health literature treats trust as a relational construct that bridges policy and community behavioral responses, as described in the Mediated Trust Model, in which trust influences perceptions of benefits and costs and an individual's ability to comply with health policy (Goren et al., 2022).

Empirically, trust in government has been proven to increase policy effectiveness through increased policy compliance and acceptance, especially in the context of health crises and preventive regulations (Stanica et al., 2023). Trust also shapes health risk perception, where high levels of trust tend to reduce excessive risk perception and increase a sense of control over health threats (Ma & Christensen, 2019). Furthermore, trust contributes to a positive attitude towards health policy, as policies are perceived as legitimate, protective, and in line with public values (Graffigna et al., 2021; Huang et al., 2025).

Perceived Policy Effectiveness (PPE) is defined as an individual's subjective evaluation of the extent to which a public policy can achieve its expected goals (Wulandari & Firdausy, 2020). In health research, PPE is not only determined by objective policy design, but also by public perception of the clarity of objectives, feasibility of implementation, fairness, and the real impact of policies on health outcomes (Story et al., 2008). The comparative effectiveness research literature emphasizes that the perception of policy effectiveness is built through comparison of results, relevant outcome indicators, and evidence-based communication to the public (Tanenbaum, 2009; Wu et al., 2010).

Empirically, PPE has been proven to play a significant role in forming the intention to avoid HFSS foods. Experimental studies show that quantitative communication regarding policy effectiveness increases PPE and simultaneously strengthens support and behavioral intent that aligns with policy objectives (Reynolds et al., 2018; Tiede et al., 2025). In the context of HFSS, policies restricting advertising and product placement are perceived to be effective in encouraging consumers to avoid unhealthy choices because they are considered to reduce exposure and facilitate healthy choices (Dhuria et al., 2023; Yau et al., 2022).

Furthermore, health risk perception is defined as an individual's subjective assessment of the susceptibility and severity of a health threat. These two dimensions form a risk evaluation that is both cognitive and affective, and both can interact dynamically depending on the context and information the individual receives (El-Toukhy, 2015). In health research, health risk perception is understood as a multidimensional construct that is influenced by personal experience, knowledge, psychosocial factors, optimism, and the way in which risk is communicated through the media and

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health institutions (García del Castillo et al., 2016). The literature also confirms that risk perception is not only rational, but involves rapid emotional responses that can strengthen or weaken cognitive judgments of health risks (Ferrer & Klein, 2015; Maguire & Looi, 2022).

Health risk perception is an important determinant of the intention to avoid HFSS foods. Individuals who perceived HFSS consumption as at high risk for obesity and chronic disease showed a stronger intention to avoid such foods (Shimul et al., 2021). Activation of risk perception through nutrition warning labels and nutritional information has been shown to increase consumers' tendency to avoid processed foods high in fat, sugar, and salt (Adasme-Berríos et al., 2020; Courbet et al., 2024).

Attitude toward avoiding HFSS reflects an individual's affective and cognitive evaluation of the behavior of avoiding foods high in fat, sugar, and salt, which is shaped by nutritional knowledge, perception of health risks, and personal values and preferences (Hong & Chung, 2022). In health research, this attitude often arises from a high awareness of the negative consequences of HFSS on non-communicable diseases such as hypertension, obesity, and cardiovascular disease (Gunawan et al., 2025; Sharma et al., 2024). However, the literature also shows that there is a gap between positive attitudes and actual practices, which are influenced by sensory factors, habits, and social contexts, including salty, sweet, and fatty taste preferences (Bolhuis et al., 2018; Proserpio et al., 2025). Besides, research confirms that explicit attitudes often interact with ambivalent implicit attitudes toward HFSS, creating internal conflicts in food decision-making (Yamanaka et al., 2012).

Some related empirical literature shows that attitudes toward avoiding HFSS foods are strong direct predictors of the intention to avoid them. A more negative attitude towards HFSS and a more positive attitude towards consumption restriction have been shown to increase the intention to avoid unhealthy foods, particularly when reinforced by health awareness and environmental policy support (Saintila et al., 2025; Yau et al., 2022). Information interventions such as nutrition labels and health campaigns also play a role in forming attitudes that are more consistent with health goals, thereby strengthening preventive behavioral intentions (Courbet et al., 2024; Januraga et al., 2021).

Food habits are important to understand as consumption patterns formed through the repetition of eating behavior in specific situational contexts, so that they become automatic and have minimal cognitive involvement (Joob & Wiwanitkit, 2014; Robbins & Costa, 2017). In eating behavior research, food habits are distinguished from rational choices because they are triggered by environmental, cultural, and social cues, and are relatively resistant to short-term changes (van't Riet et al., 2011). The literature also confirms that eating habits are firmly embedded in the context of family, traditions, and food environments, making them an important determinant in the stability of consumption behaviors, including HFSS consumption (Rueter et al., 2020; Scaglioni et al., 2011).

Related empirical evidence suggests that when HFSS eating habits are already strong, the influence of negative attitudes or health information on behavioral intentions becomes weaker, because eating responses are driven more by automation than conscious evaluation (Phipps et al., 2022; van't Riet et al., 2011). In contrast, individuals with more flexible or nutrition-conscious eating habits showed a stronger association between health attitudes and intentions to avoid unhealthy foods (Shi, 2024).

This study aims to explain the psychobehavioral mechanisms through which public health policy influences consumers' intention to avoid foods high in fat, salt, and sugar (HFSS). Specifically, the study examines the roles of HFSS policy awareness and trust in government as key policy-related antecedents shaping perceived policy effectiveness, health risk perception, and attitudes toward avoiding HFSS foods, which in turn drive consumers' behavioral intentions. Besides, this study incorporates food habits as a moderating variable to capture the extent to which habitual eating patterns condition the effectiveness of policy awareness and institutional trust in shaping consumers' psychological responses. The proposed conceptual model, developed and tested using an advanced PLS-SEM approach, is presented in Figure 1. Based on the extant literature, the following hypotheses are proposed:

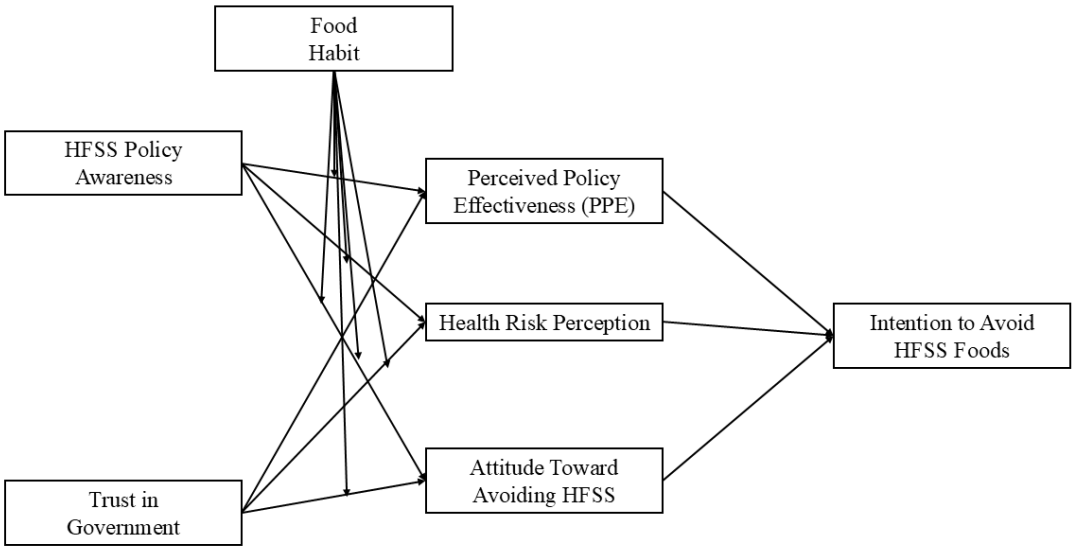

Figure 1. Proposed research model

H1: HFSS Policy Awareness has a significant effect on Perceived Policy Effectiveness.

H2: HFSS Policy Awareness has a significant effect on Health Risk Perception.

H3: HFSS Policy Awareness has a significant effect on Attitude toward Avoiding HFSS.

H4: Trust in Government has a significant effect on Perceived Policy Effectiveness.

H5: Trust in Government has a significant effect on Health Risk Perception.

H6: Trust in Government has a significant effect on Attitude toward Avoiding HFSS.

H7: Perceived Policy Effectiveness (PPE) has a significant effect on Intention to Avoid HFSS Foods.

H8: Health Risk Perception has a significant effect on Intention to Avoid HFSS Foods.

H9: Attitude towards Avoiding HFSS has a significant effect on Intention to Avoid HFSS Foods.

H10: Food habit moderates the relationship between HFSS Policy Awareness and Perceived Policy Effectiveness.

H11: Food habit moderates the relationship between HFSS Policy Awareness and Health Risk Perceptions.

H12: Food habit moderates the relationship between HFSS Policy Awareness and Attitude toward Avoiding HFSS.

H13: Food habit moderates the relationship between Trust in Government and Perceived Policy Effectiveness.

H14: Food habit moderates the relationship between Trust in Government and Health Risk Perceptions.

H15: Food habit moderates the relationship between Trust in Government and Attitude toward Avoiding HFSS.

2. METHODOLOGY

This study adopted a quantitative, cross-sectional survey design to elucidate the psychobehavioral mechanisms linking public health policies to consumers' intentions to avoid foods high in fat, sugar, and salt (HFSS). The analysis unit in this study is Indonesian young consumers aged 15-30 years. This age group was selected because it represents a critical developmental stage where eating behaviors become stable, mental well-being remains environmentally sensitive, and HFSS consumption

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in Indonesia is high, driven by ultra-processed foods, sweetened beverages, and fast food, increasing early risks of obesity and non-communicable diseases (Ferdina et al., 2024).

Primary data were collected using a structured questionnaire with a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). The use of a seven-point scale was chosen because it more sensitively captures variation in respondents' attitudes and perceptions, and has been shown to increase the reliability and validity of constructs in PLS-SEM analysis. The research instrument was developed through a synthesis of the literature relevant to public health policy, consumer behavior, and health psychology. To ensure the validity of the content and local context, the instrument was then adjusted through a Focus Group Discussion (FGD) with experts comprising public health academics, representatives of health authorities in Indonesia, and certified professional nutritionists.

Conceptually, this study measures seven primary constructs. HFSS Policy Awareness is represented by 10 indicators that measure respondents' level of knowledge, understanding, and awareness of HFSS regulations (Critchlow et al., 2020; Dhuria et al., 2023; Kininmonth et al., 2025; Meiksin et al., 2022; Muir et al., 2023; Yau et al., 2022). Trust in Government consists of 10 indicators that capture the perception of trust in government competence, transparency, and integrity in implementing HFSS policies (Dhuria et al., 2023; Hilton et al., 2023; Rockers et al., 2012; Yau et al., 2022; Zavattaro et al., 2025). Perceived Policy Effectiveness (PPE) is measured through 14 indicators that reflect respondents' assessment of the clarity of objectives, fairness, consistency, and impact of HFSS policies on public health (Bassi et al., 2024; Buse et al., 2020; Dogbe et al., 2025; Sykes et al., 2023). Furthermore, Health Risk Perception was measured using 11 indicators that assessed perceptions of physical, psychological, and economic risks associated with HFSS consumption (Adasme-Berríos et al., 2020; Birch et al., 2019; Critchlow et al., 2020; Siegrist et al., 2022). Attitude Toward Avoiding HFSS Foods consists of 11 indicators that capture affective and cognitive evaluations of efforts to avoid HFSS (Ajzen, 1991; Hauser et al., 2011; Kim & Hong, 2019; Szymkowiak et al., 2024; Worsley et al., 2018). Intention to Avoid HFSS Foods is measured by nine indicators that represent short-term and long-term behavioral intentions to reduce HFSS consumption (Bélanger-Gravel et al., 2022; Mørk et al., 2019; Naughton et al., 2015; Park et al., 2020; van Buul et al., 2019). Finally, Food Habit functions as a moderation variable with nine indicators that describe automatic eating habits, repetitive consumption patterns, and the tendency to choose HFSS or healthy foods (Aydin & Yildirim, 2021; Joob & Wiwanitkit, 2014; Kunszabó et al., 2022; Sivakumar et al., 2020; Wang, 2023).

The target population of this study comprised Indonesian young consumers aged 15-30 years who had prior experience consuming foods and beverages high in fat, sugar, and salt (HFSS). This specific segment was selected because young consumers represent a critical developmental stage in which eating habits become increasingly autonomous, exposure to digital food marketing is high, and responsiveness to public health messaging remains malleable. Moreover, HFSS consumption is particularly prevalent within this age group, making them a theoretically and practically relevant population for examining psychobehavioral mechanisms linking policy awareness to avoidance intentions.

A purposive sampling technique was employed to ensure that respondents met the following inclusion criteria: (1) domiciled in Indonesia, (2) aged between 15 and 30 years, (3) had consumed HFSS products within the last six months, and (4) had exposure to digital media or food-related advertising. These criteria were applied to ensure that participants possessed direct behavioral experience and policy exposure relevant to the constructs under investigation.

Regarding sample size determination, this study employed an a priori power analysis using G*Power 3.1.9.7 (Faul et al., 2009). The calculation was conducted under the assumptions of a medium effect size ($f^2 = 0.15$), a significance level of $\alpha = 0.05$, statistical power of 0.90, and seven predictor variables in the structural model. The G*Power output indicated that the minimum required sample size was 130 respondents to reliably detect the proposed effects. With 300 valid responses, the achieved sample size substantially exceeds the minimum requirement suggested by the power

Table 1. Respondent characteristics

Items	Classification	Frequency (n)	Percentage (%)
Gender	Male	142	47.3
	Female	154	51.3
	Other/prefer not to say	4	1.4
Age (years)	≤18	42	14.0
	19-25	146	48.7
	26-30	112	37.3
Education level	High school or lower	64	21.3
	Diploma	52	17.3
	Bachelor's degree	134	44.7
	Master's degree or higher	50	16.7
Employment status	Student	82	27.3
	Employed	146	48.7
	Self-employed	46	15.3
	Unemployed	26	8.7
Frequency of HFSS food consumption	Rarely	74	24.7
	Occasionally	132	44.0
	Frequently	94	31.3
Body Mass Index (BMI)	Underweight	28	9.3
	Normal	144	48.0
	Overweight	82	27.3
	Obese	46	15.4
Total respondents		300	100.0

analysis. This larger sample enhances statistical power, improves the precision and stability of parameter estimates, and strengthens the robustness of mediation and moderation testing within the PLS-SEM framework.

Data were collected online, with enumerators from independent, credible survey companies in Indonesia (Quision ID). Respondent criteria are strictly defined in the initial screening system to ensure compatibility with the target population's characteristics. The data collection process took place from August to November 2025. This research is carried out in accordance with WHO-CIOMS ethical standards and has obtained Ethical Clearance from the Ethics Commission of Udayana University (No. EC. 2918/UN14.2.2.VII.14/LT/2025).

The study collected data from 300 respondents, providing an adequate basis for PLS-SEM analysis. The gender distribution was balanced (51.3% female; 47.3% male), enhancing the generalizability of the findings across male and female consumers. All respondents were within the predefined age range of 15-30 years, consistent with the study's focus on young consumers. The sample was dominated by individuals aged 19-25 years (48.7%), followed by 26-30 years (37.3%), representing a life stage characterized by increasing autonomy in food choices and high exposure to digital food marketing. Most respondents had tertiary education (78.7%), indicating sufficient cognitive capacity to evaluate policy awareness, trust in government, and perceived policy effectiveness. Nearly half were employed (48.7%), while 27.3% were students, reflecting varying levels of purchasing power and lifestyle contexts that may influence food consumption patterns. Regarding HFSS consumption, 44.0% reported occasional consumption and 31.3% frequent consumption, confirming meaningful exposure to HFSS products within the sample. In terms of BMI, 48.0% were within the normal range, while 42.7% were overweight or obese, underscoring the public health relevance of examining health risk perception and avoidance intentions in this demographic. Overall, the respondent profile reflects a theoretically appropriate and behaviorally relevant segment for investigating psychobehavioral mechanisms underlying HFSS avoidance intentions.

Data were analyzed using Partial Least Squares-Structural Equation Modeling (PLS-SEM) with SmartPLS 4. PLS-SEM is appropriate for complex predictive models with multiple latent con-

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structs and non-normal data (Hair et al., 2019). The analysis included measurement model evaluation, structural model testing, and advanced analyses comprising Importance-Performance Map Analysis (IPMA), Finite Mixture PLS (FIMIX-PLS), and PLS-Predict to examine latent heterogeneity and out-of-sample predictive power (Becker et al., 2023).

3. RESULTS

The measurement model was evaluated to assess construct reliability and validity before structural analysis. The structural model's explanatory power and hypotheses were tested at a 95% confidence level, with results reported according to PLS-SEM guidelines (Hair et al., 2019). As shown in Table 2, indicator loadings were consistently high, with most values exceeding the recommended threshold of 0.70 (Hair et al., 2019), indicating strong indicator reliability. All constructs achieved satisfactory convergent validity, as reflected by AVE values above 0.50 (Legate et al., 2023). Internal consistency was also well supported, with Cronbach's Alpha and composite reliability values substantially surpassing the minimum acceptable levels (Hair et al., 2019). Besides, all outer VIF values remained below the critical threshold (5) (Kock, 2015), suggesting that multicollinearity was not a concern.

Discriminant validity was assessed using the HTMT criterion (Table 3). All HTMT ratios were below the recommended cutoff of 0.85 (Henseler

Table 2. Convergent validity, reliability, and multicollinearity

Variable	Indicator code	Outer loadings	AVE	CA	CR	VIF outer
HFSS Policy Awareness (HPA)	HPA1	0.876	0.755	0.964	0.969	2.684
	HPA2	0.880				2.727
	HPA3	0.864				3.300
	HPA4	0.868				2.336
	HPA5	0.890				3.080
	HPA6	0.882				2.858
	HPA7	0.879				2.802
	HPA8	0.871				1.534
	HPA9	0.860				3.287
	HPA10	0.820				2.698
Trust in Government (TIG)	TIG1	0.850	0.771	0.967	0.971	3.213
	TIG2	0.895				2.815
	TIG3	0.884				3.195
	TIG4	0.891				3.023
	TIG5	0.880				2.938
	TIG6	0.866				2.517
	TIG7	0.886				2.159
	TIG8	0.886				2.285
	TIG9	0.897				3.286
	TIG10	0.840				2.950
Perceived Policy Effectiveness (PPE)	PPE1	0.839	0.737	0.972	0.975	3.149
	PPE2	0.867				2.852
	PPE3	0.887				2.815
	PPE4	0.875				3.284
	PPE5	0.875				1.880
	PPE6	0.858				2.964
	PPE7	0.891				2.476
	PPE8	0.890				2.721
	PPE9	0.879				3.015
	PPE10	0.867				3.058
	PPE11	0.868				3.010
	PPE12	0.879				2.173
	PPE13	0.873				2.916
	PPE14	0.631				1.726

Table 2 (cont.). Convergent validity, reliability, and multicollinearity

Variable	Indicator code	Outer loadings	AVE	CA	CR	VIF outer
Health Risk Perception (HRP)	HRP1	0.758	0.705	0.958	0.963	3.044
	HRP2	0.864				2.514
	HRP3	0.761				1.892
	HRP4	0.767				2.573
	HRP5	0.856				2.293
	HRP6	0.840				2.304
	HRP7	0.884				2.251
	HRP8	0.882				2.932
	HRP9	0.856				2.669
	HRP10	0.858				2.861
	HRP11	0.894				3.214
Attitude toward Avoiding HFSS Foods (ATT)	ATT1	0.882	0.770	0.970	0.974	3.091
	ATT2	0.889				2.303
	ATT3	0.857				2.338
	ATT4	0.892				3.220
	ATT5	0.880				2.852
	ATT6	0.874				2.748
	ATT7	0.859				2.402
	ATT8	0.869				2.559
	ATT9	0.892				2.318
	ATT10	0.877				2.765
	ATT11	0.883				3.003
Intention to Avoid HFSS Foods (INT)	INT1	0.892	0.756	0.959	0.965	3.011
	INT2	0.849				3.068
	INT3	0.804				2.716
	INT4	0.850				3.228
	INT5	0.898				2.683
	INT6	0.884				3.023
	INT7	0.895				2.035
	INT8	0.877				2.739
	INT9	0.870				2.387
Food Habit (FH)	FH1	0.886	0.770	0.963	0.968	2.905
	FH2	0.877				2.819
	FH3	0.883				1.736
	FH4	0.869				2.631
	FH5	0.861				2.447
	FH6	0.863				3.192
	FH7	0.897				3.178
	FH8	0.884				2.779
	FH9	0.878				2.645

et al., 2015), indicating that each construct was empirically distinct from the others. Collectively, these results confirm that the measurement model exhibits strong reliability and validity, supporting its suitability for subsequent structural model analysis.

After confirming the measurement model, the structural model was evaluated to test hypothesized relationships among latent constructs, including path significance, explanatory power, effect sizes, and predictive relevance. Hypotheses were tested using bootstrapping to estimate t-values and p-values at 95% confidence level (Hair et al., 2019; Streukens & Leroi-Werelds, 2016). As summarized in Table 4, HFSS policy awareness exhibited significant positive effects on perceived policy effectiveness ($\beta = 0.257$), health risk perception ($\beta = 0.501$), and attitude toward avoiding HFSS foods ($\beta = 0.749$), with the latter showing the strongest effect size. Trust in government significantly influenced perceived policy effectiveness and attitudes, but its effect on health risk perception was not supported. In turn, perceived policy

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Table 3. Discriminant validity: Heterotrait-Monotrait (HTMT) ratio of correlations

	ATT	FH	HPA	HRP	INT	PPE	TIG
ATT	–						
FH	0.624	–					
HPA	0.681	0.653	–				
HRP	0.742	0.701	0.734	–			
INT	0.798	0.689	0.756	0.781	–		
PPE	0.723	0.712	0.809	0.764	0.792	–	
TIG	0.694	0.731	0.818	0.748	0.769	0.823	–

effectiveness and attitudes significantly predicted intention to avoid HFSS foods, whereas health risk perception did not. Regarding moderation effects, food habits did not moderate the relationships involving HFSS policy awareness; however, they significantly strengthened the effects of trust in government on perceived policy effectiveness and attitudes, albeit with small effect sizes.

The overall quality of the structural model is presented in Table 5. The R^2 and R^2 adjusted values indicate substantial explanatory power for all endogenous constructs, while Q^2 values exceeding zero confirm strong predictive relevance (Mueller & Hancock, 2018). Collectively, these results demonstrate a well-performing structural model that effectively explains consumers' intentions to avoid HFSS foods.

Beyond hypothesis testing, this study applied Importance-Performance Map Analysis (IPMA) within the PLS-SEM framework to generate actionable, policy-relevant insights. IPMA complements conventional PLS-SEM by jointly assessing construct importance (total effects) and performance (average scores), enabling policymakers to prioritize key psychobehavioral mechanisms influencing consumers' intention to avoid HFSS

Table 4. Hypotheses results for the structural model

No	Hypothesis	Path coefficient (β)	t-value	p-value	Decision	f^2
H1	HFSS Policy Awareness → Perceived Policy Effectiveness	0.257	5.650	0.000	Supported	0.184
H2	HFSS Policy Awareness → Health Risk Perception	0.501	3.810	0.000	Supported	0.167
H3	HFSS Policy Awareness → Attitude Toward Avoiding HFSS	0.749	18.645	0.000	Supported	1.965
H4	Trust in Government → Perceived Policy Effectiveness	0.153	2.698	0.007	Supported	0.140
H5	Trust in Government → Health Risk Perception	0.033	0.270	0.787	Not Supported	0.000
H6	Trust in Government → Attitude Toward Avoiding HFSS	0.175	4.088	0.000	Supported	0.166
H7	Perceived Policy Effectiveness → Intention to Avoid HFSS Foods	0.564	7.223	0.000	Supported	0.244
H8	Health Risk Perception → Intention to Avoid HFSS Foods	−0.065	0.861	0.389	Not Supported	0.006
H9	Attitude Toward Avoiding HFSS → Intention to Avoid HFSS Foods	0.476	5.527	0.000	Supported	0.200
H10	HFSS Policy Awareness × Food Habit → Perceived Policy Effectiveness	0.016	0.446	0.656	Not Supported	0.001
H11	HFSS Policy Awareness × Food Habit → Health Risk Perception	0.083	0.960	0.337	Not Supported	0.006
H12	HFSS Policy Awareness × Food Habit → Attitude Toward Avoiding HFSS	0.006	0.171	0.864	Not Supported	0.000
H13	Trust in Government × Food Habit → Perceived Policy Effectiveness	0.102	2.043	0.005	Supported	0.007
H14	Trust in Government × Food Habit → Health Risk Perception	−0.105	1.192	0.233	Not Supported	0.009
H15	Trust in Government × Food Habit → Attitude Toward Avoiding HFSS	0.213	3.076	0.000	Supported	0.029

Table 5. Structural model evaluation (R^2, R^2 adjusted, and Q^2)

No	Variable (endogenous)	R-square (R^2)	R-square adjusted	Q-square (Q^2)
1	Perceived Policy Effectiveness (PPE)	0.975	0.975	0.712
2	Health Risk Perception (HRP)	0.895	0.893	0.541
3	Attitude Toward Avoiding HFSS Foods (ATT)	0.980	0.980	0.764
4	Intention to Avoid HFSS Foods (INT)	0.943	0.943	0.689

Table 6. IPMA analysis result (construct target: Intention to Avoid HFSS Foods (INT))

Variable	Importance	Performance
Attitude toward Avoiding HFSS	0.476	64.472
Food Habit	0.343	64.827
HFSS Policy Awareness	0.469	64.366
Health Risk Perception	–0.065	64.299
Perceived Policy Awareness	0.564	64.705
Trust in Government	0.167	65.571

foods. Intention to Avoid HFSS Foods (INT) was specified as the target construct. As shown in Table 6, Perceived Policy Effectiveness demonstrated the highest importance with moderate performance, indicating strong potential for improving behavioral intention through enhanced policy design and communication. Attitudes toward Avoiding HFSS and HFSS Policy Awareness also exhibited high importance but moderate performance, highlighting critical intervention areas. Food Habit showed moderate importance, while Health Risk Perception contributed minimally. Overall, the IPMA findings emphasize strengthening policy effectiveness and consumer attitudes to maximize behavioral impact.

4. DISCUSSION

The findings for *H1-H3* collectively highlight the central role of HFSS policy awareness as a foundational cognitive driver shaping consumers' policy evaluations, risk appraisals, and attitudinal orientations toward unhealthy food avoidance. First, the positive relationship between HFSS policy awareness and perceived policy effectiveness (*H1*) suggests that awareness does not merely reflect passive exposure to regulations, but actively enhances consumers' beliefs that such policies are capable of addressing HFSS-related health concerns. When individuals understand the objectives, scope, and mechanisms of public health policies, they are more likely to interpret these interventions as credible, relevant, and practically effective, reinforcing policy legitimacy in the public mind. This interpretation aligns with prior literature demonstrating that greater awareness of HFSS policies strengthens perceived policy effectiveness, as informed consumers are more likely to associate advertising and promotion restrictions with reduced exposure and lower HFSS consumption (Harris et al., 2025; Yau et al., 2022).

Second, support for *H2* indicates that policy awareness heightens consumers' perception of health risks associated with HFSS consumption. This result is consistent with earlier studies showing that awareness of HFSS-related regulations enhances consumers' understanding of the links between HFSS consumption, obesity, and chronic diseases, thereby elevating perceived health risks (Watson et al., 2017). This finding implies that well-communicated policies function as informational cues that translate abstract nutritional guidelines into personally salient health threats. Rather than relying solely on individual knowledge, policy awareness appears to institutionalize risk communication, embedding health risks within a broader societal and regulatory context.

Most notably, the powerful effect of policy awareness on attitudes toward avoiding HFSS foods (*H3*) underscores its decisive motivational role. This finding is in line with prior evidence indicating that consumers who are aware of HFSS regulations tend to develop more favorable attitudes toward reducing HFSS intake, as such policies are perceived as supportive enablers of healthier choices rather than coercive constraints (Dhuria et al., 2023; Muir et al., 2023). Awareness of HFSS

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policies seems to trigger internalization processes whereby external regulations are transformed into favorable personal attitudes toward avoidance. This suggests that policy awareness operates not only through rational risk evaluation, but also through normative and value-based mechanisms, shaping consumer attitudes that are pivotal for sustained dietary behavior change.

The results for *H4-H6* reveal a nuanced role of trust in government in shaping consumers' responses to HFSS-related public health policies. Support for *H4* indicates that higher trust in governmental institutions enhances perceptions of policy effectiveness. This result is consistent with empirical evidence showing that trust in government strengthens perceptions of policy effectiveness by fostering public compliance and acceptance, particularly in preventive health and regulatory contexts (Stanica et al., 2023). This suggests that when citizens view the government as competent, transparent, and well-intentioned, they are more likely to believe that HFSS regulations can achieve their stated health objectives. Trust, therefore, functions as a mechanism of legitimacy, reinforcing the credibility of policy interventions and strengthening public acceptance of regulatory actions in the food domain.

In contrast, the non-significant relationship between trust in government and health risk perception (*H5*) implies that institutional trust alone is insufficient to heighten individuals' perceived vulnerability to HFSS-related health risks. Risk perception appears to be more strongly driven by direct informational cues, personal experiences, and policy awareness rather than by generalized confidence in authorities. This finding suggests a boundary condition for the influence of trust: while it shapes evaluative and attitudinal responses to policies, it does not automatically translate into heightened risk awareness. These results do not align with prior studies suggesting that higher institutional trust can attenuate perceived health risks by reducing uncertainty and fostering a sense of control over health threats (Ma & Christensen, 2019; Van Dongen et al., 2013).

Support for *H6* demonstrates that trust in government positively influences attitudes toward avoiding HFSS foods. This finding aligns with prior evidence indicating that institutional trust fosters more positive attitudes toward health-related behaviors by framing government policies as legitimate, protective, and value congruent (Graffigna et al., 2021; Huang et al., 2025). This indicates that trust facilitates the internalization of policy goals, encouraging consumers to align their personal attitudes with government-endorsed health norms. When trust is present, individuals may perceive avoidance of HFSS foods not as an external imposition but as a socially responsible and legitimate choice. Collectively, these findings underscore trust in government as a critical attitudinal and evaluative catalyst, rather than a direct driver of health risk perception, in the policy-behavioral pathway.

Support for *H7* demonstrates that perceived policy effectiveness is a dominant driver of avoidance intention. This interpretation is consistent with prior empirical evidence showing that higher perceived policy effectiveness significantly strengthens intentions to avoid HFSS foods. Experimental studies demonstrate that clear, quantitative communication of policy effectiveness enhances PPE and simultaneously increases public support and behaviorally aligned intentions (Reynolds et al., 2018; Tiede et al., 2025; Dhuria et al., 2023; Yau et al., 2022).This suggests that consumers are more likely to intend behavioral change when they believe that HFSS policies are not merely symbolic, but capable of producing tangible health benefits and meaningful market changes. Perceived effectiveness appears to reduce behavioral uncertainty, reinforcing the belief that individual compliance aligns with a broader, impactful collective effort.

In contrast, the non-significant effect of health risk perception on intention (*H8*) indicates that awareness of health risks alone is insufficient to motivate avoidance behavior. However, this result diverges from prior evidence positioning health risk perception as a central determinant of avoidance intention (Shimul et al., 2021; Adasme-Berríos et al., 2020; Courbet et al., 2024). This finding challenges conventional assumptions in health behavior models that emphasize risk perception as a primary trigger of intention. In the context of HFSS consumption, risk awareness may be normalized, abstract, or psychologically distanced, thereby weakening its motivational potency unless accompanied by stronger evaluative or attitudinal mechanisms.

Support for *H9* highlights attitudes toward avoiding HFSS foods as a critical motivational pathway. Prior studies show that more negative evaluations of HFSS consumption and positive orientations toward dietary restriction significantly strengthen intention, particularly when supported by health consciousness, policy environments, and informational interventions such as nutrition labeling and health campaigns (Saintila et al., 2025; Yau et al., 2022; Courbet et al., 2024; Januraga et al., 2021). Favorable attitudes reflect internalized evaluations that avoidance is beneficial, desirable, and socially appropriate, making intention formation more stable and self-driven. Together, these results suggest that intention to avoid HFSS foods is shaped less by fear-based risk appraisal and more by confidence in policy efficacy and positive attitudinal alignment. This underscores the importance of designing public health interventions that go beyond risk communication, emphasizing policy credibility and attitude formation to foster meaningful dietary intentions.

The moderation analysis provides important insights into the boundary conditions under which food habit shapes the influence of policy-related factors on consumers' psychological responses. The non-significant results for *H10-H12* indicate that food habits do not meaningfully alter the effects of HFSS policy awareness on perceived policy effectiveness, health risk perception, or attitudes toward avoiding HFSS foods. This suggests that awareness of HFSS policies exerts a relatively uniform influence across consumers, regardless of whether their existing food habits are healthy or entrenched in HFSS consumption. Policy awareness appears to function as a broad informational and normative cue that is resilient to habitual dietary patterns.

In contrast, food habits significantly moderated the relationships involving trust in government. Support for *H13* indicates that the positive effect of trust in government on perceived policy effectiveness is more substantial among individuals with specific food-habit profiles. This implies that habitual eating patterns condition how institutional trust is translated into evaluations of policy success. For consumers with less favorable food habits, trust in government may serve as a compensatory mechanism, reinforcing confidence in policy interventions despite personal resistance to change.

Similarly, support for *H15* reveals that food habit strengthens the relationship between trust in government and attitudes toward avoiding HFSS foods. This finding suggests that trust becomes particularly influential in shaping attitudes when habitual consumption patterns are salient, helping bridge the gap between institutional endorsement and personal dietary orientations. The non-significant moderation in *H14* further confirms that health risk perception is mainly affected by habit-trust interactions. Overall, these findings position food habits as a contextual amplifier of institutional trust, rather than policy awareness, in shaping evaluative and attitudinal pathways toward HFSS avoidance.

CONCLUSION

This study aimed to examine the psychobehavioral mechanisms through which public health policy influences consumers' intention to avoid foods high in fat, sugar, and salt (HFSS) by integrating policy awareness, trust in government, perceived policy effectiveness, health risk perception, attitude, and food habits within a PLS-SEM framework.

The findings indicate that HFSS policy awareness functions as a foundational driver that significantly shapes perceived policy effectiveness, health risk perception, and, most strongly, attitudes toward avoiding HFSS foods. Trust in government plays a complementary role by strengthening evaluative judgments and positive attitudes, although it does not directly intensify health risk perception. Intention to avoid HFSS foods is primarily determined by perceived policy effectiveness and attitude, while health risk perception alone is insufficient to directly translate into behavioral intention. Furthermore, food habit moderates the relationship between trust in government and behavioral intention, suggesting that institutional trust becomes more influential among individuals with stronger habitual consumption patterns.

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These results lead to the conclusion that effective HFSS policy implementation must go beyond increasing risk awareness and instead focus on strengthening public understanding of policy measures, enhancing perceived effectiveness, and fostering institutional trust. Behavioral change is more likely to occur when consumers perceive policies as credible, impactful, and aligned with their daily experiences. Therefore, public health strategies should integrate clear communication, transparent governance, and evidence-based demonstrations of policy outcomes to reinforce positive attitudes and ultimately encourage sustained avoidance of HFSS foods among young consumers.

AUTHOR CONTRIBUTIONS

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DECLARATION OF INTEREST

The author declares that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies, have been completely observed by the author.

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